האגודה הישראלית לחקר העין והראיה
Israel Society for Vision and Eye Research

ABSTRACTS

27TH Annual Meeting
Neve Ilan Resort Hotel
March 15-16, 2007

תקצירים

הכינוס השנתי ה- 27
מלון נוה אילן
15-16 מרץ, 2007

עריכת התוכנית:

ד"ר דרור שרון בעזרת ד"ר איל בנין, פרופ' יעקב פאר ופרופ' מרדכי רוזנר

עיצוב והבאה לדפוס: יעקב אלבז, הדסה עין-כרם.

יושבי- ראש של האגודה הישראלית לחקר העין והראיה

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Dr. Dror Sharon			**ד״ר דרור שרון**

מרצים זוכים המקבלים פרס השנה על עבודות שהוצגו בכינוס השנתי ה-26, מרץ 2006:

RECIPIENTS OF AWARDS FOR THE BEST POSTERS AND TALKS PRESENTED AT THE 26TH MEETING, MARCH 2006

1. רועי הולצמן – האוניברסיטה העברית, ירושלים
ROI HOLZMAN- THE HEBREW UNIVERSITY, JERUSALEM
עבור הפוסטר: FOR THE POSTER:
"Changes in the refractive state during prey capture under low light in the nocturnal cardinalfish apogon annularis"

2. יונתן שחר – הפקולטה לרפואה ע״ש סאקלר, אוניברסיטת תל-אביב
JONATHAN SHAHAR - SACKLER SCHOOL OF MEDICINE, TEL- AVIV UNIVERSITY
עבור ההרצאה: FOR THE ORAL PRESENTATION:
"Retinal electrophysiologic, morphologic and penetration studies following intravitreal injection of Bevacizumab (Avastin)"

3. אוהד שחם – הפקולטה לרפואה ע״ש סאקלר, אוניברסיטת תל-אביב,
OHAD SHAHAM – SACKLER SCHOOL OF MEDICINE, TEL- AVIV UNIVERSITY
עבור ההרצאה: FOR THE ORAL PRESENTATION:
"The many roles of PAX6 in development of the ocular lens"

.

הפרסים בחסות:
העמותה למחקר בריאות העין ומניעת עיוורון בישראל

The Israeli Research Association for Eye Health and Blindness Prevention (R.A.)
העמותה למחקר בריאות העין ומניעת עיוורון בישראל (ע"ר)

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ISRAEL SOCIETY FOR VISION AND EYE RESEARCH
XXVII ANNUAL MEETING
NEVE ILAN RESORT
PROGRAM AT A GLANCE

Thursday, March 15, 2007

Registration and Coffee		**08:00 – 08:30**
Opening Remarks	**("SHARON" Hall)**	**08:30 – 08:35**
Poster Session 1	**("SHARON" Hall)**	**08:35 – 09:30**
Cornea	**("SHARON" Hall)**	**09:30 – 10:30**
Coffee and Posters	**(Exhibition Halls)**	**10:30 – 11:00**
Poster Session 2	**("SHARON" Hall)**	**11:00 – 12:00**
AMD	**("SHARON" Hall)**	**12:00 – 13:00**
Lunch break	**(Dining Room)**	**13:00 – 14:00**
Guest Lecture 1	**("SHARON" Hall)**	**14:00 – 14:30**
Business Meeting	**("SHARON" Hall)**	**14:30 – 15:00**
ERG	**("SHARON" Hall)**	**15:00 – 16:00**
Genetics	**("SHARON" Hall)**	**16:00 – 16:50**
Poster viewing, Wine & Cheese	**(Exhibition Halls)**	**16:50 – 17:50**
Lens and Cataract	**("SHARON" Hall)**	**17:50 – 18:30**
Dinner (optional)	**Caravan Restaurant, Abu-Ghosh**	**19:30**

Friday, March 16, 2007

Coffee and posters	**(Exhibition Hall)**	**08:00 – 08:30**
Oncology and Tumors	**("SHARON" Hall)**	**08:30 – 09:30**
Visual Function	**("SHARON" Hall)**	**09:30 – 10:15**
Guest Lecture 2	**("SHARON" Hall)**	**10:15 – 11:00**
Coffee and Posters	**(Exhibition Halls)**	**11:00 – 11:30**
Infections	**("SHARON" Hall)**	**11:30 – 12:00**
Glaucoma and Optic Nerve	**("SHARON" Hall)**	**12:00 – 13:00**
Retina	**("SHARON" Hall)**	**13:00 – 14:00**
Concluding Remarks	**("SHARON" Hall)**	**14:00 – 14:05**

PROGRAM

Thursday, March 15, 2007

Registration 08:00 – 08:30

Opening Remarks ("SHARON" Hall) 08:30 – 08:35

Prof. Mordechai Rosner

Session I – Poster presentations 1 08:35 – 09:30

Moderators: Prof. Avi Solomon and Dr. Dror Sharon

1. **THE REMOVAL OF 10/0 POLYESTER (MERSILENE) SUTURES AFTER SMALL INCISION CONGENITAL CATARACT SURGERY**
   (1) DR. BAR-SELA SHAI (1) * DR. SPIERER ORIEL (1) PROF. SPIERER ABRAHAM
   (1) GOLDSCHLEGER EYE INSTITUTE, SHEBA MEDICAL CENTER, TEL-HASHOMER,

2. **AWARENESS AND THE USE OF NUTRITIONAL SUPPLEMENTATION FOR AGE RELATED MACULAR DEGENERATION PATIENTS**
   (1) * DR. WAISBOURD MICHAEL (1) MRS. RABINOVITCH ANAT (1) DR. HEILWEIL GADI (1) DR. GOLDSTEIN MICHAELLA (1) PROF. LOEWENSTEIN ANAT
   (1) DEPARTMENT OF OPHTHALMOLOGY, TEL AVIV SOURASKY MEDICAL CENTER

3. **CONTAMINATION OF CONTACT LENS STORAGE CASES OF REFRACTIVE SURGERY CANDIDATES**
   (1) * DR. KRATZ ASSAF (1) DR. LEVY JAIME (1) PROF. LIFSHITZ TOVA
   (1) OPHTHALMOLOGY DEPARTMENT, SOROKA UNIVERSITY MEDICAL CENTER, FACULTY OF HEALTH SCIENCES, BEN-GURION UNIVERSITY OF THE NEGEV, BEER-SHEVA, ISRAEL.

4. **LONG TERM CHANGES IN THE CYLINDER POWER OF HYPERMETROPIC CHILDREN WITH AND WITHOUT ACCOMODATIVE ESOTROPIA**
   (1) * DR. WYGNANSKI-JAFE TAMARA (2) MRS. ZWLILLING BEATRICE (2) DR. LEIBA HANA
   (1) SHEBA MEDICAL CENTER (2) KAPLAN MEDICAL CENTER

5. **CLINICAL AND HISTOLOPATHOLOGICAL ANALYSIS OF CORNEAL INTRASTROMAL ANTIBIOTIC INJECTIONS IN THE RABBIT CORNEA**
(1) * DR. LICHTER HENIA (1) DR. JAFRI BATOOL (1) DR. GROSSNIKLAUS HANS (1) DR. BANNING CHRISTOPHER (1) DR. SONG DIANE (1) DR. GARCIA-VALENZUELA ENRIQUE (2) DR. BAHAR IRIT (1) DR. EDELHAUSER HENRY
(1) EMORY UNIVERSITY, ATLANTA, GA, USA (2) RABIN MEDICAL CENTER, PETAH TIQWA, ISRAEL

6. **STRUCTURE-FUNCTION RELATIONSHIP IN GLAUCOMA – A STUDY IN UNILATERAL PSEUDOEXFOLIATION GLAUCOMA**
(1) * DR. BARKANA YANIV (2) DR. BURGANSKY-ELIASH ZVIA (1) DR. AVNI ISAAC (1) DR. KAPLAN AUDREY
(1) DEPARTMENT OF OPHTHALMOLOGY, THE ASSAF HAROFE MEDICAL CENTER, ZERIFIN (2) DEPARTMENT OF OPHTHALMOLOGY, THE EDITH WOLFSON MEDICAL CENTER, HOLON

7. **DIASTOLIC DOUBLE PRODUCT IN NORMAL TENSION GLAUCOMA - A NEW ENTITY TO CONSIDER**
(1) * DR. NESHER RONIT (1) DR. SHULMAN SHIRI (2) PROF. NESHER GIDEON (3) DR. KOHAN RICARDO (4) PROF. HARRIS ALON
(1) DEPARTMENT OF OPHTHALMOLOGY, MEIR MEDICAL CENTER, KFAR SABA, ISRAEL, SACKLER MEDICAL SCHOOL, TEL AVIV UNIVERSITY, TEL AVIV, ISRAEL (2) DEPARTMENT OF INTERNAL MEDICINE, SARRE ZEDEK MEDICAL CENTER, HEBREW UNIVERSITY MEDICAL SCHOOL, JERUSALEM, ISRAEL. (3) DEPARTMENT OF INTERNAL MEDICINE, CARMEL HOSPITAL, HAIFA, ISRAEL (4) DEPARTMENT OF OPHTHALMOLOGY, INDIANA SCHOOL OF MEDICINE, INDIANA, USA

8. **EFFECT OF PARA-AMINOBENZOIC ACID ON THE COURSE OF RETINAL DEGENERATION IN RD10 MICE**
(1) * DR. GALBINUR TURAL (1) DR. OBOLENSKY ALEXEY (1) DR. CHOWERS ITAY (1) DR. BANIN EYAL
(1) DEPT. OF OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM

9. **ENHANCED S-CONE SYNDROME WITH HEARING LOSS - A POSSIBLE NEW SYNDROME.**
(1) * DR. ROTENSTREICH YGAL (1) DR. MOROZ IRIS (2) DR. PRAS ERAN (1) PROF. MOISSEIEV JOSEPH
(1) GOLDSCHLAGER EYE INSTITUTE. SHEBA MEDICAL CENTER (2) DEPARTMENT OF OPHTHALMOLOGY, ASSAF HAROFEH MEDICAL CENTER, ZERIFIN

10. **PATHOLOGICAL MECHANISMS LEADING TO EPIPHORA AND OTHER OCULAR MANIFESTATIONS RELATED TO WEEKLY ADMINISTRATION OF DOCETAXEL**

(1) * DR. SEIDER NIR (1) DR. GILBOA MICHAEL (1) PROF. MEYER EWY (2) DR. TSALIC MEDDY (2) PROF. HAIM NISSIM (1) PROF. MILLER BENJAMIN
(1) DEPARTMENT OF OPHTHALMOLOGY AND (2) DEPARTMENT OF ONCOLOGY, RAMBAM MEDICAL CENTER

11. **TRANSPLANTATION OF RPE DERIVED FROM HUMAN EMBRYONIC STEM CELLS IN ALBINO AND DYSTROPHIC RAT EYES**

(1) * MRS. ALPER RUSLANA (2) MRS. IDELSON MARIA (1) DR. OBOLENSKY ALEXEY (1) DR. HEMO ITSHAK (1) MRS. YAUL RUTH (2) PROF. REUBINOFF BENJAMIN (1) DR. BANIN EYAL
(1) CENTER FOR RETINAL AND MACULAR DEGENERATIONS, DEPARTMENT OF OPHTALMOLOGY (2) CENTER FOR HUMAN EMBRYONIC STEM CELLS, GENE THERAPY INSTITUTE, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER

12. **COMPARATIVE STUDY OF THE OUTCOMES OF DEEP LAMELLAR KERATOPLASTY (DALK) VS PENETRATING KERATOPLASTY (PK)**

(1) * DR. BERGER YOAV (2) PROF. ROOTMAN DAVID S.
(1) ALBERTO MOSCONA DEPARTMENT OF OPHTHALMOLOGY, RAMBAM HEALTH CARE CAMPUS, HAIFA , ISRAEL (2) DEPARTMENT OF OPHTHALMOLOGY, TORONTO WESTERN HOSPITAL, DEPARTMENT OF OPHTHALMOLOGY AND VISION SEINCES, UNIVERSITY OF TORONTO, CANADA

13. **TRAUMATIC WOUND DEHISCENCE AFTER PENETRATING KERATOPLASTY**

(1) * DR. VICUNA-KOJCHEN JOAQUIN (1) PROF. FUCHT-PERY JOSEPH (1) DR. LANDAU DAVID (1) DR. ORUCOV FAIK (1) PROF. SOLOMON ABRAHAM
(1) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM, ISRAEL

14. **EVALUATING THE EFFECT OF DICLOFENAC DROPS VS. DEXAMETHASONE DROPS FOLLOWING TRABECULECTOMY WITH MITOMYCIN C + PHACOEMULCIFICATION + POSTERIOR CHAMBER INTRA OCULAR LENS IMPLANTATION SURGERY.**

(1) * DR. KATZ GABRIEL (2) DR. KALEV-LANDOY MAYA (1) DR. GOLDENFELD MODI (1) PROF. MELAMED SHLOMO (1) DR. LEVKOVITCH-VERBIN HANI
(1) GOLDSCHLEGER EYE INSTITUTE, SHEBA MEDICAL CENTER, TEL-HASHOMER (2) EYE DEPARTMENT, WOLFSON MEDICAL CENTER, HOLON

15. **INTRAVITREAL TRIAMCINOLONE ACETONIDE FOR RADIATION MACULOPATHY AFTER PLAQUE RADIOTHERAPY FOR CHOROIDAL MELANOMA**

(1) * DR. VISHNEVSKIA-DAI VICKTORIA (2) DR. SHIELDS CAROL (2) DR. DEMIRCHI HAKAN (2) DR. MARR BRAIN (2) DR. MASHAYEKHI ARMON (2) DR. MATERIN MIGEL (2) DR. MANQUEZ MARIA (2) DR. SHIELDS JERRY
(1) OCULAR ONCOLOGY SERVICE, THE GOLDSCHLEGER EYE INSTITUTE, SHEBA MEDICAL CENTER, TEL AVIV UNIVERSITY, ISRAEL (2) OCULAR ONCOLOGY SERVICE, WILLS EYE HOSPITAL, THOMAS JEFFERSON UNIVERSITY, PHILADELPHIA, PENNSYLVANIA, USA

16. **ATYPICAL PATTERNS IN SCANNING LASER POLARIMETRY-CLINICAL CORRELATIONS**

(1) * MR. ORLEV AMIR (1) DR. HORANI AMJAD (1) DR. RAPSON YAEL (1) DR. COHEN MATAN J (1) DR. BLUMENTHAL EYTAN Z
(1) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH - HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM

17. **SPECTRUM AND THE SUSCEPTIBILITIES OF MICROBIAL ISOLATES IN OCULAR INFECTIONS**

(1) DR. ORUCOV FAIK (1) * DR. LEAL SERGIO (2) PROF. BLOCK COLIN (2) PROF. MOSES ALON (1) PROF. FRUCHT-PERY JOSEPH (1) PROF. SOLOMON ABRAHAM
(1) DEPARTMENT OF OPHTHALMOLOGY AND (2) DEPARTMENT OF MICROBIOLOGY; HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM

18. **NOVEL PSYCHOPHYSICAL TEST FOR DIAGNOSIS OF AGE RELATED MACULAR DEGENERATION BY IDENTIFICATION OF COMBINED COLOR VISION AND CONTRAST SENSITIVITY DEFECTS**

(1) * MRS. BEN ELI HADAS (1) PROF. HOCHSTEIN SHAUL (2) DR. CHOWERS ITAY
(1) NEUROBIOLOGY DEPARTMENT, INSTITUTE OF LIFE SCIENCES, HEBREW UNIVERSITY, JERUSALEM (2) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH – HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM

19. **TRANSIENT MACULAR THICKENING AFTER PHACOEMULCIFICATION SURGERY**

(1) * DR. WOLFSON YULIA (1) PROF. GEYER ORNA
(1) OPHTHALMOLOGY, CARMEL MEDICAL CENTER

20. **RETINAL NERVE FIBER LAYER (RNFL) THICKNESS AND MACULAR THICKNESS IN PATIENTS WITH MULTIPLE SCLEROSIS**

(1) * DR. WOLFSON YULIA (1) DR. HOROWITZ JOSEFA (1) PROF. GEYER ORNA (2) PROF. MILLER ARIEL
(1) OPHTHALMOLOGY AND (2) NEUROLOGY; CARMEL MEDICAL CENTER

21. **STRUCTURAL ABNORMALITIES OF THE CORNEA AND LID RESULTING FROM COLLAGEN V MUTATION IN EHLER DANLOS SYNDROME TYPE I**

(1) * DR. SEGEV FANI (2) DR. COLE WILLIAM (2) DR. SLOMOVIC ALLAN (2) DR. ROOTMAN DAVID (2) PROF. HEON ELISE (3) PROF. BIRK DAVID
(1) DEPARTMENT OF OPHTHALMOLOGY, MEIR GENERAL HOSPITAL, KFAR-SABA, ISRAEL (2) DEPARTMENT OF OPHTHALMOLOGY AND VISION SCIENCES, THE HOSPITAL FOR SICK CHILDREN, TORONTO, ON, CANADA (3) DIVISION OF HUMAN GENETICS, CINCINNATI CHILDREN′S HOSPITAL, CINCINNATI, OH, USA

22. **CAN IVIG INHIBIT FORMATION OF TUMOR BY INSEMINATED CELLS IN AN EYE MODEL ?**

(1) * DR. SOLOMON ARIEH S (2) PROF. BLANK MIRI (3) PROF. SHOENFELD YEHUDA
(1) GOLDSCHLEGER EYE RESEARCH INSTITUTE (2) CENTER OF AUTOIMMUNE DISEASE (3) DEPARTMENT OF INTERNAL MEDICINE "B"

23. **NEURONAL CORRELATES OF BINOCULAR PROCESSING MANIPULATING MONOCULAR PERCEPTION**

(1) * MR. YEHEZKEL OREN (1) DR. STERKIN ANNA (1) PROF. BELKIN MICHAEL (2) PROF. SAGI DOV (1) DR. POLAT URI
(1) GOLDSCHLEGER EYE RESEARCH INSTITUTE, TEL AVIV UNIVERSITY , TEL HASHOMER (2) DEPARTMENT OF NEUROBIOLOGY, BRAIN RESEARCH, THE WEIZMANN INSTITUTE OF SCIENCE

Session II – Cornea ("SHARON" Hall) 09:30 – 10:30

Moderators: Prof. Avi Solomon and Prof. Tova Liphshitz

09:30-09:40 **"PATHOGNOMONIC" PATTERN OF CORNEAL EROSION AND OTHER OCULAR INJURIES CAUSE BY AIRSOFT GUNS**

(1) * DR. KRATZ ASSAF (1) DR. LEVY JAIME (1) DR. CHELES DORINA (1) DR. ASHKENAZI ZACH (1) DR. TSUMI EREZ (2) DR. SADOT OREN (3) MR. LEINOV ELI (3) MR. FORMOZA ASSAF (3) MR. KIRIN BORIS (3) PROF. SHER ERAN (3) PROF. BEN DOR GABI (1) PROF. LIFSHITZ TOVA
(1) OPHTHALMOLOGY DEPARTMENT, SOROKA UNIVERSITY MEDICAL CENTER, FACULTY OF HEALTH SCIENCES, BEN-GURION UNIVERSITY OF THE NEGEV, BEER SHEVA, ISRAEL (2) MECHANICAL ENGINEERING DEPARTMENT, BEN-GURION UNIVERSITY OF THE NEGEV, BEER SHEVA, ISRAEL, AND NRCN ISRAEL (3) MECHANICAL ENGINEERING DEPARTMENT, BEN-GURION UNIVERSITY OF THE NEGEV, BEER SHEVA, ISRAEL

09:40-09:50 **STUDYING THE EFFECT OF CORNEAL TISSUE PROPERTIES AND IOP ON NORMAL AND KERATOCONIC CORNEAS USING FINITE ELEMENTS BIOMECHANICAL MODEL**

(1) * DR. MANDEL YOSSI (2) MR. SHALOM RAN (2) PROF. ELAD DAVID (2) DR. GEFEN AMIT
(1) THE SELIM AND RACHEL BENIN SCHOOL OF COMPUTER SCIENCE AND ENGINEERING. THE HEBREW UNIVERSITY OF JERUSALEM (2) DEPARTMENT OF BIOMEDICAL ENGINEERING, TEL AVIV UNIVERSITY

09:50-10:00 **THE POTENTIAL USE OF AMNIOTIC MEMBRANE TRANSPLANTATION FOR TREATMENT OF PARTIAL LIMBAL STEM CELL DEFICIENCY FOLLOWING SULFUR MUSTARD EXPOSURE IN RABBITS**

(1) * DR. KADAR TAMAR (1) DR. COHEN LIAT (1) DR. DACHIR SHLOMIT (1) DR. COHEN MAAYAN (1) DR. FISHBINE ELIEZER (1) DR. SAHAR RITA (1) DR. TURETZ JOSEF (1) DR. ROZNER AMIR (2) DR. SOLOMON AVI (1) DR. AMIR ADINA
(1) DEPARTMENT OF PHARMACOLOGY, ISRAEL INSTITUTE FOR BIOLOGICAL RESEARCH, NESS ZIONA. (2) HADASSAH UNIVERSITY HOSPITAL, JERUSALEM, ISRAEL

10:00-10:10 **OCULAR EFFECT, TOLERABILITY AND SAFETY OF 0.03% TACROLIMUS OINTMENT IN PATIENTS WITH INTRACTABLE ALLERGIC CONJUNCTIVITIS**

(1) * DR. ATTAS-FOX LIAT (1) DR. ISKHAKOV VLADIMIR (1) DR. RAVECH SVETLANA (1) PROF. AVNI ISAAC (1) DR. ZADOK DAVID
(1) ASSAF HAROFEH MEDICAL CENTER

10:10-10:20 **LONG TERM CONTROL OF POST-LASIK MYOPIC SHIFT IN HIGH MYOPIA WITH TOPICAL TIMOLOL MALEATE**
(1) * PROF. SOLOMON ABRAHAM (1) DR. ORUCOV FAIK (1) DR. LANDAU DAVID (1) DR. STRASSMAN EYAL (1) PROF. FRUCHT-PERY JOSEPH
(1) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM

10:20-10:30 **DOWNREGULATION OF VEGF RECEPTORS (VEGFR-1/FLT-1 AND VEGFR-2/FLK-1) IN THE HUMAN CONJUNCTIVAL EPITHELIUM IN CHRONIC OCULAR SURFACE INFLAMMATORY DISORDERS**
(1) * DR. BRACHA ZOHAR (1) MRS. MAFTZIR GENIA (1) PROF. FRUCHT-PERY JOESPH (1) DR. ORUKOV FAIK (1) PROF. SOLOMON ABRAHAM
(1) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM

Coffee and Posters (Exhibition Halls) 10:30 – 11:00

Session III – Poster presentations 2 11:00 – 12:00

Moderators: Dr. Ron Ofri and Dr. Dror Sharon

24. **HAPTOGLOBIN GENOTYPE AND RETINOPATHY OF PREMATURITY**
(1) * DR. MEZER EEDY (2) DR. MAKHOUL IMAD (3) DR. MELAMUD ALINA (4) DR. MILLER-LOTAN RACHEL (1) PROF. MILLER BENJAMIN (1) DR. COCHAVI ORNA (5) DR. DAVKIN OLGA (5) DR. ROTSCHILD AVI (2) DR. SUJOV POLO (4) PROF. LEVY ANDREW
(1) OPHTHALMOLOGY, RAMBAM HEALTH CARE CAMPUS (2) NEONATOLOGY, RAMBAM HEALTH CARE CAMPUS (3) OPHTHALMOLOGY, CARMEL MEDICAL CENTER (4) MOLECULAR BIOLOGY, FACULTY OF MEDICINE, TECHNION (5) NEONATOLOGY, CARMEL MEDICAL CENTER

25. **PREVENTION OF DIABETIC DAMAGE TO INTACT BOVINE LENS IN CULTURE USING ANTIOXIDANTS**
(1) * DR. BORMUSOV ELVIRA (2) MRS. DOVRAT YAEL (1) PROF. DOVRAT AHUVA
(1) RAPPAPORT FACULTY OF MEDICINE, TECHNION – ISRAEL INSTITUTE OF TECHNOLOGY, HAIFA (2) KORET SCHOOL OF VETERINARY MEDICINE, THE HEBREW UNIVERSITY OF JERUSALEM

26. **INTERACTION OF TEMPORAL AND SPATIAL FREQUENCY IN THE CONTRAST TRANSFER FUNCTION OF THE PATTERN ELECTRORETINOGRAM**
(1) * DR. BEN-SHLOMO GIL (2) PROF. BACH MICHAEL (2) DR. OFRI RON
(1) KORET SCHOOL OF VETERINARY MEDICINE, HEBREW UNIVERSITY OF JERUSALEM, REHOVOT, ISRAEL (2) UNIVERSITY HOSPITAL, DEPARTMENT OF OPHTHALMOLOGY, FREIBURG, GERMANY EL.

27. **CHROMOSOME 3 ABERRATIONS PRECEDE THE DEVELOPMENT OF NETWORK EXTRAVASCULAR MATRIX PATTERN IN UVEAL MELANOMA**
(1) * DR. MEIR TAL (2) DR. ZESCHNIGK MICHAEL (2) MR. MABHOFER LARS (1) PROF. PE’ER JACOB (1) DR. CHOWERS ITAY
(1) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH – HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM, ISRAEL (2) THE INSTITUT FUR HUMANGENETIK, UNIVERSIT&AUML; TSKLINIKUM ESSEN, ESSEN, GERMANY.

28. **EVALUATING SUPPRESSION OF NONSENSE MUTATIONS BY AMINOGLYCOSIDE ANTIBIOTICS AS AN INTERVENTION FOR VISION LOSS IN TYPE I USHER SYNDROME**
(1) * MRS. REBIBO-SABBAH ANNIE (2) DR. AHMED ZUBAIR (2) DR. SCHULTZ JULIE (2) PROF. FRIEDMAN THOMAS (3) PROF. BAASOV TIMOR (1) DR. BEN-YOSEF TAMAR
(1) GENETICS DEPARTMENT, RAPPAPORT FACULTY OF MEDICINE, TECHNION, HAIFA (2) LABORATORY OF MOLECULAR GENETICS, NATIONAL INSTITUTE ON DEAFNESS AND OTHER COMMUNICATION DISORDERS, NIH, ROCKVILLE, USA (3) DEPARTMENT OF CHEMISTRY, INSTITUTE OF CATALYSIS SCIENCE AND TECHNOLOGY, TECHNION, HAIFA

29. **HISTOLOGICAL CRITERIA FOR GRADING OF ATYPIA IN MELANOCYTIC CONJUNCTIVAL LESIONS**
(1) * DR. EPSTEIN DAVID (2) DR. MALY ALEXANDER (2) DR. MEIR KAREN (3) PROF. PE'ER JACOB
(1) DEPARTMENT OF OPHTHALMOLOGY, KAPLAN MEDICAL CENTER, REHOVOT (2) DEPARTMENT OF PATHOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM (3) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM

30. **ABETALIPOPROTEINEMIA IN ISRAEL: A FOUNDER MUTATION IN THE ASHKENAZI JEWISH POPULATION AND A CONTIGUOUS GENE DELETION IN AN ARAB PATIENT**
(1) * MRS. BENAYOUN LIAT (2) PROF. GRANOT ESTHER (1) MRS. LEAH RIZEL (3) DR. ALLON-SHALEV STAVIT (4) DR. BEHAR DORON M. (1) DR. BEN-YOSEF TAMAR

(1) GENETICS DEPARTMENT, RAPPAPORT FACULTY OF MEDICINE, TECHNION, HAIFA (2) DIVISION OF PEDIATRICS, KAPLAN MEDICAL CENTER, REHOVOT (3) GENETICS INSTITUTE, HA'EMEK MEDICAL CENTER, AFULA (4) MOLECULAR MEDICINE LABORATORY, RAMBAM HEALTH CARE CAMPUS, HAIFA

31. **GENETIC AND CLINICAL ANALYSES OF A LARGE FAMILY WITH X-LINKED CONE-ROD DEGENERATION**
(1) * DR. SHARON DROR (1) MRS. MEISSONNIER-MIZRAHI LILIANA (1) MRS. BIDA LINA (1) DR. BANIN EYAL
(1) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM, ISRAEL

32. **HYPERMETHYLATION OF CPG ISLAND LOCI OF MULTIPLE TUMOR SUPPRESSOR GENES IN RETINOBLASTOMA**
(1) * MRS. MERHAVI EFRAT (1) MRS. AVRAHAM REVITAL BAT-CHEN (2) DR. COHEN YORAM (3) DR. FRENKEL SHAHAR (3) PROF. PE'ER JACOB (1) DR. GOLDENBERG-COHEN NITZA
(1) OPHTHALMOLOGY, KRIEGER EYE RESEARCH LABORATORY, RABIN MEDICAL CENTER, FMRC, TEL AVIV UNIVERSITY, ISRAEL (2) GYNECOLOGY, SHEBA MEDICAL CENTER, CANCER RESEARCH CENTER, RAMAT GAN, ISRAEL (3) OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM, ISRAEL.

33. **BONE MARROW DERIVED STEM CELLS DIFFERENTIATION IN ISCHEMIC RETINA**
(1) * MRS. AVRAHAM REVITAL BAT CHEN (1) PROF. WEINBERGER DOV (1) DR. GOLDENBERG-COHEN NITZA
OPHTHALMOLOGY, THE KRIEGER EYE RESEARCH LABORATORY, FMRC, RABIN MEDICAL CENTER, TEL AVIV UNIVERSITY, PETACH TIKVA, ISRAEL

34. **MOLECULAR CHANGES IN THE MOUSE RETINA FOLLOWING INDUCTION OF CENTRAL RETINAL ARTERY OCCLUSION**
(1) * MRS. DADON SHIMRIT (2) DR. KRAMER MICHAL (2) DR. BAHAR IRIT (1) MRS. AVRAHAM REVITAL BAT-CHEN (2) DR. HASANGRILU MURAT (2) DR. ELDAR IDO (2) PROF. WEINBERGER DOV (1) DR. GOLDENBERG-COHEN NITZA
(1) THE KRIEGER EYE RESEARCH LABORATORY, FMRC, TEL AVIV UNIVERSITY, ISRAEL (2) OPHTHALMOLOGY, RABIN MEDICAL CENTER, SACKLER SCHOOL OF MEDICINE, TEL AVIV UNIVERSITY, PETACH TIKVA, ISRAEL

35. **A COMPARISON OF THE ELECTRICAL IMPEDANCE PROPERTIES OF PRESERVED AND FRESH PORCINE OCULAR TISSUES**
(1) * DR. MANDEL YOSSI (2) DR. IVORRA ANTONI (3) MR. MILLER LIRON (4) PROF. BELKIN MICHAEL (1) PROF. RUBINSKY BORIS
(1) THE SELIM AND RACHEL BENIN SCHOOL OF COMPUTER

SCIENCE AND ENGINEERING, THE HEBREW UNIVERSITY OF JERUSALEM (2) DEPARTMENT OF MECHANICAL ENGINEERING AND DEPARTMENT OF BIOENGINEERING, UNIVERSITY OF CALIFORNIA AT BERKELEY (3) NEUFELD CARDIAC RESEARCH INSTITUTE,SHEBA MEDICAL CENTER,TEL-AVIV UNIVERSITY (4) OPHTHALMIC TECHNOLOGIES LABORATORY GOLDSCHLEGER EYE RESEARCH INSTITUTE SACKLER, SCHOOL OF MEDICINE TEL AVIV UNIVERSITY

36. **CAXONAL DAMAGE AND DEMYLINATION IN THE OPTIC NERVE FOLLOWING CRUSH INJURY OF TRANSGENIC MICE**
(1) * MRS. DRATVIMAN OLGA (2) DR. HASANRIGULOSO MURAT (1) MRS. DADON SHIMRIT (1) MRS. AVRAHAM REVITAL BAT CHEN (2) PROF. WEINBERGER DOV (1) DR. GOLDENBERG COHEN NITZA
(1) OPHTHALMOLOGY, THE KRIGER EYE RESEARCH LABORATORY,FMRC, TEL AVIV UNIVERSITY, PETAH TIKVA, ISRAEL (2) OPHTHALMOLOGY, RABIN MEDICAL CENTER, SACKLER SCHOOL OF MEDICINE, TEL AVIV UNIVERSITY, ISRAEL

37. **CHEMOKINE RECEPTOR-2 KNOCKOUT MOUSE (CCR2-/-) AS AN ANIMAL MODEL FOR AGE RELATED MACULAR DEGENERATION (AMD)**
(1) * MRS. HOROWITZ SMADAR (1) MR. WEISS AVRAHAM (1) MRS. LEDERMAN MICHAL (1) MR. BARZEL ISRAEL (1) DR. OBOLENSKY ALEXEY (1) DR. BANIN EYAL (1) DR. CHOWERS ITAY
(1) DEPARTMENT OF OPHTHALMOLOGY, HEBREW UNIVERSITY - HADASSAH MEDICAL CENTER - JERUSALEM, ISRAEL

38. **RETINAL DEGENERATIONS CAUSED BY NR2E3 MUTATIONS IN THE ISRAELI AND PALESTINIAN POPULATIONS**
(1) * MRS. BANDAH DIKLA (1) PROF. MERIN SAUL (1) DR. BANIN EYAL (1) DR. SHARON DROR
(1) DEPT. OF OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM, ISRAEL

39. **REGISTERED BLINDNESS AMONG ADULTS IN ISRAEL: 1996-2005**
(1) * DR. MATANIS MILKA (1) DR. HOD YAIR (1) PROF. GEYER ORNA
(1) DEPARTMENT OF OPHTHALMOLOGY, CARMEL MEDICAL CENTER, HAIFA

40. **RDH5 MUTATION ANALYSIS IN A SERIES OF ISRAELI PATIENTS WITH FUNDUS ALBIPUNCTATUS: DETECTION OF NOVEL MUTATIONS**
(1) DR. PRAS ERAN (2) DR. SHARON DROR (2) DR. BANIN EYAL (3) DR. ROTENSTREICH YGAL (4) MRS. ABU ALMOGIT (1) * MRS. RAVECH SVETLANA (1) PROF. AVNI ISAAC
(1) DEPARTMENT OF OPHTHALMOLOGY, ASSAF HAROFEH

MEDICAL CENTER, ZERIFIN. (2) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM (3) DEPARTMENT OF OPHTHALMOLOGY, SHEBA MEDICAL CENTER, TEL HASHOMER. (4) GARTNER INSTITUTE OF HUMAN GENETICS, SHEBA MEDICAL CENTER, TEL HASHOMER

41. **DESENSITIZATION OF TRPV1 IN PAIN TRANSDUCTION**
(1) * DR. GORDON-SHAAG ARIELA (2) DR. GORDON SHARONA (3) PROF. MINKE BARUCH
(1) HADASSAH COLLEGE, DEPT. OF OPTOMETRY (2) UNIVERSITY OF WASHINGTON, DEPT. OF PHYSIOLOGY (3) HEBREW UNIVERSITY, DEPT. OF PHYSIOLOGY

42. **ROLES OF PAX6 IN RETINAL PIGMENTED EPITHELIUM (RPE) DEVELOPMENT**
(1) MR. ANTES RAN (1) DR. SHISTIK LENA (1) MRS. YOFFE CHEN (1) * DR. ASHERY-PADAN RUTH
(1) DEPARTMENT OF HUMAN GENETICS AND BIOCHEMISTRY, FACULTY OF MEDICINE, TEL AVIV UNIVERSITY, ISRAEL.

43. **THE ROLES OF PAX6 IN DEVELOPMEND OF THE OCULAR LENS**
(1) * MR. SHAHAM OHAD (2) PROF. ROBINSON MICHAEL L. (1) DR. ASHERY-PADAN RUTH
(1) HUMAN GENETICS AND BIOCHEMISTRY, SACKLER SCHOOL OF MEDICINE, TEL AVIV UNIVERSITY, TEL AVIV, ISRAEL (2) DEPARTMENT OF ZOOLOGY, MIAMI UNIVERSITY, OXFORD, OH, USA

44. **ELUCIDATING THE TRANSCRIPTIONAL TARGETS OF PAX6 IN MAMMALIAN RETINOGENESIS**
(1) * MR. ELGART MICHAEL (1) DR. ORON-KARNI VARDA (2) DR. OSCHRY YITZCHAK (3) PROF. RECHAVI GIDI (1) DR. ASHERY-PADAN RUTH
(1) DEPARTMENT OF HUMAN GENETICS & BIOCHEMISTRY, SACKLER SCHOOL OF MEDICINE TEL AVIV UNIVERSITY (2) DEPARTMENT OF MEDICINE B, HADASSAH UNIVERSITY HOSPITAL, JERUSALEM (3) HEAD, SHEBA CANCER RESEARCH CENTER AND AND PED. HEMATO-ONCOLOGY

45. **HISTOLOGICAL AND CROSS-SPECIES MICROARRAY ANALYSIS OF THE PERIPHERAL RETINA VERSUS THE RED AREA IN THE PIGEON**
(1) * MR. TOMER SWISSA (1) MRS. BANDAH DIKLA (2) DR. RON OFRI (1) DR. DROR SHARON
(1) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM, ISRAEL (2) SCHOOL OF VETERINARY MEDICINE, HEBREW UNIVERSITY OF JERUSALEM, REHOVOT, ISRAEL

46. **EVALUATION OF OCULAR SURFACE CHANGES SULFUR MUSTARD INJURIES IN RABBITS, USING IMPRESSION CYTOLOGY**
(1) * MRS. GUTMAN HILA (1) DR. DACHIR SHLOMIT (1) DR. SOLOMON AVI (1) MRS. COHEN LIAT (1) MRS. COHEN MAAYAN (1) MR. FISHBINE ELIEZER (1) DR. AMIR ADINA (1) DR. KADAR TAMAR
(1) DEPT. OF PHARMACOLOGY, ISRAEL INSTITUTE FOR BIOLOGICAL RESEARCH, NESS ZIONA

47. **INVOLVEMENT OF MMPS IN OCULAR RESPONSE TO SULFUR MUSTARD IN RABBITS**
(1) * DR. GIVANT-HORWITZ VERED (1) DR. DACHIR SHLOMIT (1) MRS. COHEN LIAT (1) MR. SHALEM YOAV (1) MRS. GUTMAN HILA (1) MRS. COHEN MAAYAN (1) MR. FISHBINE ELIEZER (1) DR. TURETZ JOSEPH (1) DR. KADAR TAMAR (1) DR. AMIR ADINA
(1) DEPT. OF PHARMACOLOGY, ISRAEL INSTITUTE FOR BIOLOGICAL RESEARCH, NESS ZIONA

Session IV - AMD ("SHARON" Hall) 12:00-13:00

Moderators: Dr. Itay Chowers and Prof. Anat Loewenstein

12:00-12:10 **A NEW HOME-MONITORING-AMD-PERIMETER FOR THE DETECTION OF CNV ONSET**
(1) PROF. LOEWENSTEIN ANAT (1) DR. GOLDSETIN MICHEALA (2) DR. RAFAELI OMER (1) * DR. BARAK ADIEL
(1) OPHTHALMOLOGY, TEL AVIV MEDICAL CENTER (2) NOTALVISION

12:10-12:20 **PHARMACOKINETICS OF BEVACIZUMAB AFTER SINGLE INTRAVITREAL INJECTION IN THE RABBIT**
(1) * DR. HEILWEIL GAD (2) DR. KOMAROWSKA IZABELA, (2) PROF. PERLMAN IDO (1) PROF. LOEWENSTEIN ANAT
(1) OPHTHALMOLOGY, TEL AVIV MEDICAL CENTER (2) DEPARTMENT OF PHYSIOLOGY AND BIOPHYSICS, FACULTY OF MEDICINE, TECHNION – ISRAEL INSTITUTE OF TECHNOLOGY, HAIFA

12:20-12:30 **GENE EXPRESSION PATTERNS IN WHITE BLOOD CELLS FROM PATIENTS WITH NEOVASCULAR AGE RELATED MACULAR DEGENERATION**
(1) * MR. WEISS AVRAHAM (1) MRS. LEDERMAN MICHAL (1) MRS. DELEON EFRAT (1) DR. CHOWERS ITAY
(1) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH – HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM,

12:30-12:40 **ASSESSMENT OF CORRELATION AMONG SINGLE NUCLEOTIDE POLYMORPHISMS IN CHROMOSOME 10Q26, HTRA1 GENE EXPRESSION LEVELS, AND CLINICAL CHARACTERISTICS OF NEOVASCULAR AGE RELATED MACULAR DEGENERATION**

(1) * DR. CHOWERS ITAY (1) MRS. LEDERMAN MICHAL (2) DR. WEINSTEIN ORLY (1) DR. ABU ASLEH SALEH (3) DR. GOLDENBERG-COHEN NITZA (1) DR. LAHAD AMNON (4) PROF. POLLACK AYALA (3) DR. AVISAR INBAL (3) DR. AXER-SIEGEL RUTH (4) DR. HAUSER DAVID (1) DR. BANIN EYAL (1) DR. AVERBUKH EDWARD (1) DR. HEMO YITZHAK (1) DR. MEIR TAL

(1) HADASSAH - HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM (2) SOROKA UNIVERSITY MEDICAL CENTER, BEER SHEVA (3) RABIN MEDICAL CENTER, PETAH TIQVA (4) KAPLAN MEDICAL CENTER, REHOVOT

12:40-12:50 **ELUCIDATING THE ROLE OF PYRIDINIUM BIS-RETINOID (A2E) IN THE PATHOGENESIS OF AGE RELATED MACULAR DEGENERATION (AMD)**

(1) * DR. BEN-SHABAT SHIMON (1) MRS. SHTEPMAN SOFIA (1) DR. BEIT-YANNAI ELIE

(1) PHARMACOLOGY AND SCHOOL OF PHARMACY, BEN-GURION UNIVERSITY OF THE NEGEV

12:50-13:00 **INTRAVITREAL BEVACIZUMAB (AVASTIN) FOR NEOVASCULAR AGE-RELATED MACULAR DEGENERATION**

(1) * DR. LEVY JAIME (1) DR. SHNECK MARINA (1) DR. WEINSTEIN ORLY (1) DR. PITCHKHADZE ANRY (1) DR. KLEMPERER ITAMAR (1) PROF. LIFSHITZ TOVA

(1) DEPARTMENT OF OPHTHALMOLOGY, SOROKA UNIVERSITY MEDICAL CENTER, BER-SHEVA

Lunch break 13:00 – 14:00

Guest Lecture 1 ("SHARON" Hall) 14:00 – 14:30

Prof. Robert B. Nussenblatt, M.D.

National Eye Institute (NEI), National Institute of Health (NIH), Bethesda, MD, USA

AMD: THE ARGUMENT FOR IMMUNE MEDIATION

Business Meeting 14:30 – 15:00

Session V – ERG 15:00 – 16:00

(In memory of Prof. Fabian Abraham)

Moderators: Prof. Ido Perlman and Dr. Ygal Rotenstreich

15:00-15:10 **DR. MUSAYEV: IN MEMORY OF PROF. ABRAHAM**

15:10-15:20 **A COMMON FOUNDER MUTATION OF CERKL UNDERLIES AUTOSOMAL RECESSIVE SEVERE RETINAL DEGENERATION WITH EARLY MACULAR INVOLVEMENT IN THE YEMENITE JEWISH POPULATION**
(1) MRS. AUSLENDER NOA (2) DR. SHARON DROR (1) DR. ABBASI ANAN H. (3) DR. GARZOZI HANNA (2) DR. BANIN EYAL (1) * DR. BEN-YOSEF TAMAR
(1) GENETICS DEPARTMENT, RAPPAPORT FACULTY OF MEDICINE, TECHNION, HAIFA (2) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH- HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM (3) DEPARTMENT OF OPHTHALMOLOGY, BNAI ZION MEDICAL CENTER, HAIFA

15:20-15:30 **INCREMENT LIGHT INTENSITIES AFFECTING THE FULL FIELD ELECTRORETINOGRAM IN THE INTEROCULAR AMPLITUDE DIFFERENCES IN NORMAL SUBJECTS.**
(1) * DR. ROTENSTREICH YGAL (1) MRS. BINIAMINOV LUBOV (2) MRS. BERENSTEIN YUVAL
(1) GOLDSCHLEGER EYE INTITUTE. SHEBA MEDICAL CENTER (2) BEN GURION UNIVERSITY. MEDICAL SCHOOL

15:30-15:40 **PROTECTIVE EFFECT OF ZINC-DESFERRIOXAMINE COMPLEX IN THE RD10 MOUSE MODEL OF RETINAL DEGENERATION**
(1) * DR. OBOLENSKY ALEXEY (1) MRS. DELEON EFRAT (1) MRS. ALPER RUSLANA (1) MRS. LEDERMAN MICHAL (2) DR. BERENSHTEIN EDDY (2) PROF. CHEVION MORDECHAI (1) DR. CHOWERS ITAY (1) DR. BANIN EYAL
(1) DEPARTMENT OF OPHTHALMOLOGY, HEBREW UNIVERSITY-HADASSAH MEDICAL SCHOOL, JERUSALEM (2) DEPARTMENT OF CELLULAR BIOCHEMISTRY AND HUMAN GENETICS, HEBREW UNIVERSITY-HADASSAH MEDICAL SCHOOL, JERUSALEM

15:40-15:50 **PROGRESSIVE AND SEVERE STARGARDT-LIKE DISEASE CAUSED BY A NOVEL ABCA4 FOUNDER SPLICING MUTATION**

(1) * DR. BANIN EYAL (1) MRS. BEIT-YA'ACOV ANAT (1) MRS. MEISSONNIER-MIZRAHI LILIANA (1) DR. OBOLENSKY ALEXEY (2) DR. LANDAU CARMIT (1) DR. BLUMENFELD ANAT (2) DR. ROSENMANN ADA (1) DR. SHARON DROR
(1) DEPARTMENT OF OPHTHALMOLOGY AND (2) THE MICHAELSON INSTITUTE FOR VISION REHABILITATION; DEPT. OF OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM, ISRAEL

15:50-16:00 **FUNCTIONAL EVALUATION OF THE NEUROPROTECTIVE EFFECT OF GLATIRAMER-ACETATE (COPAXONE) ON THE RAT INNER RETINA DURING MATURATION AND AGING ®**
(1) * DR. BEN-SHLOMO GIL (1) DR. OFRI RON
(1) KORET SCHOOL OF VETERINARY MEDICINE, HEBREW UNIVERSITY OF JERUSALEM, REHOVOT, ISRAEL

Session VI - Genetics 16:00 – 16:50

Moderators: Dr. Tamar Ben-Yosef and Dr. Ruth Ashery-Padan

16:00-16:10 **HEREDITARY FAMILY SIGNATURE OF FACIAL EXPRESSION**
(1) * MRS. PELEG GILI (2) PROF. KATZIR GADI (1) DR. PELEG OFER (3) MRS. KAMARA MICHAL (1) DR. BRODSKY LEONID (3) PROF. HEL-OR HAGIT (3) PROF. KEREN DANIEL (1) PROF. NEVO EVIATAR
(1) INSTITUTE OF EVOLUTION, UNIVERSITY OF HAIFA (2) DEPTARTMENT OF BIOLOGY, ORANIM-UNIVERSITY OF HAIFA (3) THE DEPARTMENT OF COMPUTER SCIENCE, UNIVERSITY OF HAIFA

16:10-16:20 **OCULAR BIOMETRY, REFRACTION AND PACHYMETRY IN NEONATES CONCEIVED BY IN VITRO FERTILIZATION VERSUS NATURAL CONCEPTION**
(1) * DR. HERSCOVICI ZVI (2) DR. SNIR MOSHE (1) PROF. KREMER ISRAEL (1) PROF. WEINBERGER DOV (1) DR. AXER-SIEGEL RUTH
(1) DEPARTMENT OF OPHTHALMOLOGY, RABIN MEDICAL CENTER (BEILINSON CAMPUS), PETAH TIQVA, ISRAEL (2) PEDIATRIC OPHTHALMOLOGY AND STRABISMUS UNIT, SCHNEIDER CHILDREN′S MEDICAL CENTER OF ISRAEL, PETACH-TIKVA, ISRAEL

16:20-16:30 **A WHOLE GENOME HOMOZYGOSITY SCAN OF A FAMILY AFFECTED BY AUTOSOMAL RECESSIVE CONE-ROD DYSTROPHY WITH HIGH MYOPIA SUGGESTS LINKAGE**

TO CHROMOSOME 4P.
(1) * DR. PRAS ERAN (2) MRS. ABU ALMOGIT (1) DR. ETING EVA (1) PROF. AVNI ISAAC
(1) DEPARTMENT OF OPHTHALMOLOGY, ASSAF HAROFEH MEDICAL CENTER, ZERIFIN. (2) GARTNER INSTITUTE OF HUMAN GENETICS, SHEBA MEDICAL CENTER, TEL HASHOMER

16:30-16:40 **A MISSENSE CNGA3 MUTATION RARE IN WESTERN POPULATIONS IS FREQUENT AMONG JEWISH AND MUSLIM PATIENTS WITH ACHROMATOPSIA**
(1) * MRS. BIDA LINA (1) MR. GREENBERG ALEX (1) DR. ANAT BLUMENFELD (2) DR. ADA ROSENMANN (1) PROF. MERIN SAUL (1) DR. BANIN EYAL (1) DR. SHARON DROR
(1) DEPT. OF OPHTHALMOLOGY AND (2) THE MICHAELSON INSTITUTE FOR VISION REHABILITATION; HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM.

16:40-16:50 **GENETIC DISSECTION OF PAX6 DOSAGE REQUIRMENTS IN THE DEVELOPING EYE**
(1) * MRS. DAVIS-SILBERMAN NOA (2) DR. BERGER JOACHIM (3) PROF. TAMM ERNST R. (2) DR. STOYKOVA ANASSTASIA (1) DR. ASHERY-PADAN RUTH
(1) SACKLER FACULTY OF MEDICINE, DEPARTMENT OF HUMAN GENETICS AND MOLECULAR MEDICINE, TEL AVIV UNIVERSITY, ISRAEL (2) MAX-PLANCK-INSTITUTE FOR BIOPHYSICAL CHEMISTRY, G&OUML;TTINGEN, GERMANY (3) DEPARTMENT OF ANATOMY, MOLECULAR ANATOMY AND EMBRYOLOGY, UNIVERSITY OF ERLANGEN-N&UUML;RNBERG, GERMANY

Poster viewing (Exhibition Halls) 16:50 – 17:50
Wine & Cheese

Session VII - Lens and Cataract 17:50 – 18:30

Moderators: Prof. Ehud Assia and Prof. Ahuva Dovrat

17:50-18:00 **IS IT SAFE TO USE CELLULAR TELEPHONES?**
(1) * PROF. DOVRAT AHUVA (1) DR. BORMUSOV ELVIRA
(1) RAPPAPORT FACULTY OF MEDICINE, TECHNION-ISRAEL INSTITUTE OF TECHNOLOGY, HAIFA

18:00-18:10 **EXPERIMENTAL STUDY ON THE SAFETY AND EFFICACY OF THE SEELENS – NEW HYDROPHILIC ACRYLIC IOL**
(1) * DR. SHULMAN SHIRI (1) DR. GEFFEN NOA (1) DR. TAM GUY (1) PROF. ASSIA EHUD
(1) OPHTHALMOLOGY DEPARTMENT,MEIR MEDICAL CENTER, KFAR-SABA

18:10-18:20 **THE QUATER SPHERE LENS: A NEW OPTICAL ELEMENT WITH OPTICAL AND OPHTHALMIC IMPLEMENTATIONS**
(1) * PROF. BARTOV ELISHA
(1) EDITH WOLFSON MEDICAL CENTER EYE DEPARTMENT

18:20-18:30 **AVOIDING POSTOPERATIVE IOP ELEVATION IN PHACOEMULSIFICATION CATARACT SURGERY WITH THE USE OF AN ANTERIOR CHAMBER MAINTAINER WITHOUT VISCOELASTIC MATERIAL**
(1) * DR. COTLEAR DANEL (1) DR. RASKIN EYAL (1) DR. LEVARTOVSKY SHMUEL
(1) BARZILAI MEDICAL CENTER ASHKELON

Dinner – 19:30, Caravan Restaurant, Abu-Gosh (optional)

Friday, March 16, 2007

Coffee and Posters (Exhibition Hall) 08:00 – 08:30

Session VIII - Oncology and Tumors 08:30 – 09:30

Moderators: Prof. Jacob Pe'er and Dr. Nitza Goldenberg-Cohen

08:30-08:40 **CHARACTERIZING MOLECULAR PATHWAYS WHICH UNDERLIE THE DEVELOPMENT OF METASTASES FROM UVEAL MELANOMA**
(1) * MRS. DROR RINAT (1) DR. MEIR TAL (2) DR. YU XUEPING (2) DR. QIAN JIANG (3) DR. SIMON ITAMAR (1) PROF. PE'ER JACOB (1) DR. CHOWERS ITAY
(1) OPHTHALMOLOGY, HADASSAH - HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM, ISRAEL (2) WILMER EYE INSTITUTE, JOHNS HOPKINS UNIVERSITY SCHOOL OF MEDICINE, BALTIMORE, MD (3) MOLECULAR BIOLOGY, HEBREW UNIVERSITY – HADASSAH SCHOOL OF MEDICINE, JERUSALEM, ISRAEL

08:40-08:50 **PROGESTERONE RECEPTOR AND C-KIT EXPRESSION IN ORBITAL CAVERNOUS HEMANGIOMAS**
(1) DR. BRISCOE DANIEL (1) * DR. ROSEN ELI (2) DR. KIDRON DVORAH
(1) DEPT OF OPHTHALMOLOGY AND (2) DEPT OF PATHOLOGY; MEIR MEDICAL CENTER, KFAR SABA

08:50-09:00 **INTRAVITREAL INJECTIONS OF METHOTREXATE FOR THE TREATMENT OF VITREORETINAL LYMPHOMA**
(1) * DR. FRENKEL SHAHAR (2) PROF. SIEGAL TALI (2) MRS. SHALOM EDNA (1) PROF. PE'ER JACOB
(1) DEPARTMENT OF OPHTHALMOLOGY AND (2) NEURO-ONCOLOGY CENTER; HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM

09:00-09:10 **TPS - A CYTOKERATIN MARKER, AS A POTENTIAL BLOOD MARKER FOR DETECTING METASTATIC UVEAL MELANOMA**
(1) * PROF. BARAK VIVIAN (2) DR. FRENKEL SHAHAR (1) MRS. KALICKMAN INNA (2) DR. HENDLER KAREN (3) PROF. FOLBERG ROBERT (2) PROF. PE'ER JACOB
(1) DEPARTMENT OF ONCOLOGY AND (2) DEPARTMENT OF OPHTHALMOLOGY; HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM (3) DEPARTMENT OF PATHOLOGY, UNIVERSITY OF ILLINOIS AT CHICAGO, CHICAGO, IL, USA

09:10-09:20 **EPIGENETIC SILENCING STATUS OF MULTIPLE GENES IN UVEAL MELANOMA**

(1) * MRS. MERHAVI EFRAT (1) MRS. AVRAHAM REVITAL BAT-CHEN (2) DR. COHEN YORAM (3) DR. FRENKEL SHAHAR (3) DR. CHOWERS ITAY (3) PROF. PE'ER JACOB (1) DR. GOLDENBERG-COHEN NITZA
(1) OPHTHALMOLOGY, KRIEGER EYE RESEARCH LABORATORY, FMRC, TAU, RABIN MEDICAL CENTER, PETACH TIKVA, ISRAEL (2) GYNECOLOGY, SHEBA CANCER RESEARCH CENTER, SHEBA MEDICAL CENTER, RAMAT GAN, ISRAEL (3) OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM, ISRAEL

09:20-09:30 **COMBINED STEROID ADMINISTRATION VIA INTRALESIONAL INJECTION AND SUB-TENON'S INFUSION FOR THE TREATMENT OF PERIORBITAL AND ORBITAL CAPILLARY HEMANGIOMA**

(1) * DR. SNIR MOSHE (2) DR. AXER-SIEGEL RUTH (3) DR. BEN-AMITAI DAN (1) DR. GOLDENBERG-COHEN NITZA (2) PROF. WEINBERGER DOV (2) DR. FRILING RONIT
(1) PEDIATRIC OPHTHALMOLOGY UNIT, SCHNEIDER CHILDREN′S MEDICAL CENTER OF ISRAEL, (2) DEPARTMENT OF OPHTHALMOLOGY, RABIN MEDICAL CENTER (3) PEDIATRIC DERMATOLOGY UNIT, SCHNEIDER CHILDREN′S MEDICAL CENTER OF ISRAEL

Session IX - Visual Function 09:30 – 10:15

Moderators: Dr. Yehoshua Almog and Dr. Yair Morad

09:30-09:40 **THE PATTERN OF CORRELATION BETWEEN VISUAL ACUITY AND COLOR VISION IN DIFFERENT TYPES OF VISUAL LOSS**

(1) * DR. ALMOG YEHOSHUA (1) DR. NEMET ARIE
(1) MEIR MEDICAL CENTER

09:40-09:50 **THE RELATION BETWEEN NIGHT MYOPIA AND NIGHTTIME MOTOR VEHICLE ACCIDENTS**

(1) * DR. MORAD YAIR (1) DR. COHEN YUVAL (1) PROF. AVNI ISAAC
(1) DEPARTMENT OF OPHTHALMOLOGY, ASSAF HAROFEH MEDICAL CENTER, ZRIFIN

09:50-10:00 **NEUROVISION™ TREATMENT FOR MODERATE AMBLYOPIA**

(1) * DR. LEVINGER ELIYA (1) DR. LEVINGER SHEMUEL
(1) ENAIM REFRACTIVE MEDICAL CENTER

10:00-10:10 **THE EFFECTS OF REFRACTIVE SURGERY ON AMBLYOPIA IN ADULT EYES**
(1) DR. ORUCOV FAIK (1) * DR. CARAZA MAURICIO (1) MR. CASPI ZIV (1) DR. LANDAU DAVID (1) DR. STRASSMAN EYAL (1) PROF. FRUCHT-PERY JOSEPH (1) PROF. SOLOMON ABRAHAM
(1) DEPARTMENT OF OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER

Guest Lecture 2 ("SHARON" Hall) 10:15 – 11:00

Prof. Robert B. Nussenblatt, M.D.
National Eye Institute (NEI), National Institute of Health (NIH), Bethesda, MD, USA

EXPERIMENTAL AUTOIMMUNE UVEORETINITIS AND THE CLINIC - A HEALTHY SYMBIOSIS

Coffee and Posters (Exhibition Halls) 11:00 – 11:30

Session X - Infections 11:30 – 12:00

Moderators: Dr. Guy Kleinmann and Dr. Irina Barequet

11:30-11:40 **PREVENTION OF STAPHYLOCOCCUS EPIDERMIDIS ENDOPHTHALMITIS BY PRESOAKED COLLAGEN SHIELDS COMPARED WITH TOPICAL PROPHYLAXIS**
(1) * DR. KLEINMANN GUY (2) DR. HAUGEN BRIAN O (2) DR. WERNER LILIANA (2) DR. HAYMORE JONATHAN G (2) DR. ROMANIV NATALYA (2) PROF. MAMALIS NICK (2) PROF. OLSON RANDALL J
(1) DEPARTMENT OF OPHTHALMOLOGY, KAPLAN MEDICAL CENTER, AFFILIATED TO THE SCHOOL OF MEDICINE, HEBREW UNIVERSITY AND HADASSAH, JERUSALEM (2) JOHN A MORAN EYE CENTER, UNIVERSITY OF UTAH, SALT LAKE CITY, UTAH, USA

11:40-11:50 **INTRAVITREAL STAPHYLOLYSIN TREATMENT OF S. AUREUS EXPERIMENTAL ENDOPHTHALMITIS - FURTHER STUDIES**
(1) * DR. BAREQUET IRINA (1) DR. HABOT-WILNER ZOHAR (2) DR. MANN ORAN (1) MRS. SAFRIN MARY (1) PROF. KESSLER EFRAT (1) PROF. ROSNER MORDECHAI
(1) GOLDSCHLEGER EYE RESEARCH INSTITUTE, TEL AVIV UNIVERSITY SACKLER FACULTY OF MEDICINE, SHEBA

MEDICAL CENTER, TEL HASHOMER (2) DEPT. OF OPHTHALMOLOGY, TEL AVIV SOURASKY MEDICAL CENTER, TEL AVIV

11:50-12:00 **IS THE COMBINATION OF MOXIFLOXACIN AND POVIDONE IODINE MORE EFFECTIVE THAN POVIDONE IODINE ALONE FOR REDUCING BACTERIAL GROWTH IN THE CONJUNCTIVAL SAC ?**
(1) * DR. HALACHMI- EYAL ORLY (1) DR. LANG YARON (2) DR. KENESS YORAM (3) DR. MIRON DAN
(1) DEPARTMENT OF OPHTHALMOLOGY, HA'EMEK MEDICAL CENTER, AFULA (2) LABORATORY OF MICROBIOLOGY, HA'EMEK MEDICAL CENTER, AFULA (3) INFECTIOUS DISEASE CONSULTATION SERVICE, HA'EMEK MEDICAL CENTER, AFULA, RAPPAPORT SCHOOL OF MEDICINE, HAIFA, ISRAEL

Session XI - Glaucoma and Optic Nerve 12:00 – 13:00

Moderators: Prof. Orna Geyer and Dr. Hani Levkovitch-Verbin

12:00-12:10 **TRAUMATIC BRAIN INJURY INDUCED NEUROPROTECTION OF RETINAL GANGLION CELLS TO OPTIC NERVE CRUSH**
(1) * DR. BEN SIMON GUY (2) PROF. HOVDA DAVID (2) DR. HARRIS NEIL (3) DR. GOMEZ-PINILLA FERNANDO (4) PROF. ROBERT GOLDBERG
(1) GOLDSCHLEGER EYE INSTITUTE, SHEBA MEDICAL CENTER, TEL HASHOMER, ISRAEL (2) DIVISION OF NEUROSURGERY, DEPARTMENT OF SURGERY, UCLA, LOS ANGELES, CALIFORNIA, USA (3) DEPARTMENT OF PHYSIOLOGICAL SCIENCE, UCLA, LOS ANGELES, CALIFORNIA, USA (4) JULES STEIN EYE INSTITUTE, DEPARTMENT OF OPHTHALMOLOGY, UCLA, LOS ANGELES, CALIFORNIA, USA

12:10-12:20 **DIFFERENT MAPK PROTEINS ARE PRESENTED AND ACTIVATED IN THE AQUEOUS HUMOR OF RATS, DEPENDING ON ELEVATED IOP.**
(1) * DR. BEIT-YANNAI ELIE (1) MRS. SHMULEVICH ALLA
(1) CLINICAL PHARMACOLOGY,FACULTY OF HEALTH SCIENCES, BEN-GURION UNIVERSITY OF THE NEGEV

12:20-12:30 **AXONAL DEGENERATION IN GLAUCOMA HAS DIFFERENT MOLECULAR COMPONENTS THAN RETINAL GANGLION CELL APOPTOSIS**

(1) * DR. LEVKOVITCH-VERBIN HANI (1) MRS. NISGAV YAEL (1) DR. DARDIK RIMA (1) MRS. VANDER SHELLY (1) PROF. MELAMED SHLOMO
(1) GOLDSCHLEGER EYE INST, SHEBA MEDICAL CENTER, TEL-HASHOMER, ISRAEL.

12:30-12:40 **SELECTIVE LASER TRABECULOPLASTY (SLT) IN THE TREATMENT OF PRIMARY ANGLE CLOSURE WITH PERSISTENT ELEVATED IOP FOLLOWING IRIDOTOMY**

(1) * DR. BARKANA YANIV (2) DR. CHING LIN HO (3) DR. LAI JIMMY (4) DR. AQUINO MARIO (5) DR. ROJANAPONGPUN PRIN (6) DR. HON TYM WONG (7) DR. AQUINO CECILIA (8) PROF. BELKIN MICHAEL
(1) DEPARTMENT OF OPHTHALMOLOGY, ASSAF HAROFE MEDICAL CENTER , ZERIFIN , ISRAEL (2) SINGAPORE NATIONAL EYE CENTER , SINGAPORE (3) UNITED CHRISTIAN HOSPITAL, HONG KONG (4) ST. LUKE′S MEDICAL CENTER, PHILIPPINES (5) CHULALONGKORN UNIVERSITY & HOSPITAL, THAILAND (6) TAN TOCK SENG HOSPITAL, SINGAPORE (7) NATIONAL UNIVERSITY HOSPITAL , SINGAPORE (8) GOLDSCHLEGER EYE RESEARCH INSTITUTE, TEL AVIV UNIVERSITY, ISRAEL

12:40-12:50 **THE DIAGNOSTIC YIELD OF OPTIC NERVE ULTRASONOGRAPHY DIFFERENTIATING PAPILLEDEMA FROM PSEUDOPAPILLEDEMA IN EYES WITH SWOLLEN DISCS**

(1) * DR. NEUDORFER MEIRA (1) DR. SIEGMAN MAYTAL (1) DR. HAMMEL NAAMA (1) DR. KESLER ANAT
(1) DEPARTMENT OF OPHTHALMOLOGY, TEL AVIV MEDICAL CENTER, TEL AVIV.

12:50-13:00 **COMPARISON OF RETINAL NERVE FIBER LAYER THICKNESS IN GLAUCOMATOUS AND NONARTERTIC ANTERIOR ISCHEMIC OPTIC NEUROPATHY**

(1) * DR. AREV-FISHELZON TAGIL (1) DR. HOROWITZ JOSEPHA (1) DR. MATHALONE NURIT (1) DR. SEGEV EITAN (1) PROF. GEYER ORNA
(1) DEPARTMENT OF OPHTHALMOLOGY, CARMEL MEDICAL CENTER, HAIFA

Session XII - Retina 13:00 – 14:00

Moderators: Prof. Beni Miller and Prof. Dov Weinberger

13:00-13:10 **IRON METABOLISM ABNORMALITIES AND OXIDATIVE INJURY IN MOUSE MODELS OF RETINAL AND MACULAR DEGENERATION**

(1) * MRS. DELEON EFRAT (1) MRS. LEDERMAN MICHAL (2) DR. BERENSTEIN EDDY (2) PROF. CHEVION MORDECHAI (1) DR. CHOWERS ITAY
DEPARTMENT OF OPHTHALMOLOGY, THE HADASSAH – HEBREW UNIVERSITY MEDICAL CENTER (2) DEPARTMENT OF CELLULAR BIOCHEMISTRY AND HUMAN GENETICS, THE HEBREW UNIVERSITY OF JERUSALEM

13:10-13:20 **MODULATION OF EPITHELIAL DIFFERENTIATION OF RETINAL PIGMENT EPITHELIAL CELLS THROUGH INHIBITION OF HISTONE DEACETYLASE ACTIVITY USING HYPERICIN**

(1) * MRS. BARLIYA TILDA (2) DR. LIVNAT TAMI (1) DR. LAVIE GAD (3) PROF. WEINBERGER DOV
(1) BLOOD CENTER, SHEBA MEDICAL CENTER (2) HEMATOLOGY, SHEBA MEDICAL CENTER (3) DEPARTMENT OF OPHTHALMOLOGY, BEILINSON MEDICAL CENTER

13:20-13:30 **TRANSCONJUNCTIVAL SUTURELESS 23-GAUGE VITRECTOMY: IMPLEMENTATION AND RESULTS**

(1) * DR. SEGAL ORI (2) DR. TADAYONI RAMIN (2) PROF. GAUDRIC ALAIN
(1) OPHTHALMOLOGY DEPT, ASSAF HAROFE HOSPITAL (2) OPHTHALMOLOGY DEPT, LARIBOISIERE UNIVERSITY HOSPITAL, PARIS, FRANCE

13:30-13:40 **THE EFFECT OF ANGIOPOIETIN-1 ON VASCULAR PERMEABILITY AND RETINAL NEOVASCULARIZATION IN A RABBIT MODEL OF PROLIFERATIVE RETINOPATHY**

(1) * DR. BACHAR ANAT (2) PROF. PERLMAN IDO (3) DR. FLUGELMAN MOSHE (1) PROF. MILLER BENJAMIN
(1) THE ALBERTO MUSCUNA OPHTHALMOLOGY DEPARTMENT, RAMBAM, HEALTH CARE CAMPUS, HAIFA (2) PHYSIOLOGY DEPARTMENT, THE RUTH AND BRUCE RAPPAPORT FACULTY OF MEDICINE, TECHNION- ISRAEL INSTITUTE OF TECHNOLOGY, HAIFA (3) CARDIOLOGY DEPARTMENT, THE LADY DAVIS HOSPITAL, CARMEL, HAIFA

13:40-13:50 **EXPRESSION OF PRO-INFLAMMATORY CYTOKINES IN A MOUSE MODEL OF CENTRAL RETINAL ARTERY OCCLUSION**

(1) * DR. KRAMER MICHAL (2) MRS. DADON SHIMRIT (1) DR. HASANGRILU MURAT (1) PROF. WEINBERGER DOV (2) DR. GOLDENBERG-COHEN NITZA
(1) DEPARTMENT OF OPHTHALMOLOGY, RABIN MEDICAL CENTER, SACKLER SCHOOL OF MEDICINE, TEL AVIV UNIVERSITY, TEL AVIV (2) THE KRIEGER EYE RESEARCH LABORATORY, FMRC, TEL AVIV UNIVERSITY, TEL AVIV

13:50-14:00 **OPTOELECTRONIC RETINAL PROSTHESIS: SYSTEM DESIGN AND PERFORMANCE**

(1) * PROF. PALANKER DANIEL (2) MR. LOUDIN JIM (2) DR. SIMANOVSKII DMITRII (2) MR. SRAMEK CHRISTOPHER (2) MR. BUTTERWICK ALEXANDER (1) MR. HUIE PHIL
(1) DEPARTMENT OF OPHTHALMOLOGY (2) HANSEN EXPERIMENTAL PHYSICS LABORATORY, STANFORD UNIVERSITY, STANFORD, CA, 94305, USA

Concluding Remarks 14:00 – 14:05

Prof. Mordechai Rosner

ABSTRACTS

POSTER SESSION 1

THE REMOVAL OF 10/0 POLYESTER (MERSILENE) SUTURES AFTER SMALL INCISION CONGENITAL CATARACT SURGERY

(1) DR. BAR-SELA SHAI (2) * DR. SPIERER ORIEL (3) PROF. SPIERER ABRAHAM
(1) GOLDSCHLEGER EYE INSTITUTE, SHEBA MEDICAL CENTER, TEL-HASHOMER, ISRAEL (2) GOLDSCHLEGER EYE INSTITUTE, SHEBA MEDICAL CENTER, TEL-HASHOMER, ISRAEL (3) GOLDSCHLEGER EYE INSTITUTE, SHEBA MEDICAL CENTER, TEL-HASHOMER, ISRAEL

Introduction: The purpose of this study was to evaluate the functioning of a 10/0 polyester (Mersilene) sutures for small corneal incision congenital cataract surgery.
Patients / Methods: We retrospectively reviewed the medical records of 55 cases (39 patients), aged 2 months to 12 years, who underwent congenital cataract extraction and intraocular lens implantation between 1999 and 2004, using Mersilene sutures. An examination looking for suture-related complications and retionoscopy was done 1 week after surgery and then every month for 6 months. The sutures were removed in cases of local tissue reaction, but not due to high postoperative astigmatism. Paired t-test was used to compare patients' age and astigmatism level in those cases which had suture removal (group1) as opposed to those who did not (group 2).
Results: In 10 cases (18%) corneal vascularization, necessitating suture removal, was found during 6-month follow-up period, without the trigger of loose suture. patients' age was 3.5 ± 3.3 years and 4.2 ± 3.1 years in groups 1 and 2, respectively. At 1 week postoperatively the astigmatism value was 1.7 ± 1.7 Diopter (D) and 2.4 ± 2.2 D in groups 1 and 2, respectively, and it reduced to 0.9 ± 0.8, in both groups at 6 months postoperatively. One case of endophthalmitis was encountered 2 days after suture removal.
Conclusions: Removal of Mersilene sutures after congenital cataract surgery is required in cases of corneal vascularization, occurring during the first months postoperatively. Owing to the risk of general anesthesia and infection, suture removal should be considered with caution in cases of postoperative astigmatism.

AWARENESS AND THE USE OF NUTRITIONAL SUPPLEMENTATION FOR AGE RELATED MACULAR DEGENERATION PATIENTS

(1) * DR. WAISBOURD MICHAEL (1) MRS. RABINOVITCH ANAT (1) DR. HEILWEIL GADI (1) DR. GOLDSTEIN MICHAELLA (1) PROF. LOEWENSTEIN ANAT
(1) DEPARTMENT OF OPHTHALMOLOGY, TEL AVIV SOURASKY MEDICAL CENTER

Introduction: AMD is the leading cause for blindness and visual impairment in the developed world. The Age Related Eye Disease Study (AREDS) recommended the use of nutritional supplementations for selected patient in order to reduce the risk of progression to advanced AMD in up to 25%. The aim of our study was to assess the awareness of age related macular degeneration (AMD) patients regarding their own ocular disease and the implementation of the (AREDS) recommendation for the use of nutritional supplementation in these patients.
Patients / Methods: Ninety nine patients suffering from AMD participated in this study. The patients were surveyed about their extent of knowledge about AMD and their use of nutritional supplementation.
Results: Nearly half (43%, n=43) of AMD patients noted their knowledge of their own ocular disease was low. Twenty two percent (n=22) noted medium extent of knowledge and only 34% (n=34) noted high extent of knowledge of AMD. Most patients (55%, n=55) could not correctly name their own ocular condition and named AMD in 21 different manners. Less than half (46%, n=46) of all candidates for treatment were actually taking the proper treatment and dosage.
Conclusions: AMD patients lack knowledge about their own ocular disease with more than half of the patients who could not correctly name their illness. Most patients suitable for nutrient supplementations usage were not receiving them at all or received an incorrect dosage. Therefore further patient education and better implementation of the AREDS recommendations is advisable.

CONTAMINATION OF CONTACT LENS STORAGE CASES OF REFRACTIVE SURGERY CANDIDATES

(1) * DR. KRATZ ASSAF (1) DR. LEVY JAIME (1) PROF. LIFSHITZ TOVA
(1) OPHTHALMOLOGY DEPARTMENT, SOROKA UNIVERSITY MEDICAL CENTER, FACULTY OF HEALTH SCIENCES, BEN-GURION UNIVERSITY OF THE NEGEV, BEER-SHEVA, ISRAEL.

Introduction: Frequency of refractive surgery is increasing, reaching one million procedures per year in the USA alone. Many of the candidates for refractive surgery are contact lens wearers who wish to get rid of their contact lenses. Theoretically, contamination of contact lenses prior to refractive surgery may put the patient in higher risk for developing post-op infections such as ulcerative keratitis. The purpose of this study was to examine the existence of contamination of contact lens storage cases of refractive surgery candidates.
Patients / Methods: Thirty storage cases of sixteen asymptomatic refractive surgery candidates were examined. A sample of solution from each storage case was taken and cultured for the growth of bacteria, fungi and acanthamoeba. For the detection of bacteria and fungi, both traditional method and broth based method (Bactec Peds Plus F) were used.
Results: Bacterial contamination was found in 63.3% of contact lens storage cases while fungal contamination was found in 3.3%. No growth of acanthamoeba was detected. The most common detected pathogen was Pseudomonas, accounting for 37% of all positive bacterial growths. Gram+ bacteria were responsible for 32% of positive growth. In 26% of cases there was a growth of more the one kind of bacteria. The yield of the Bactec method was significantly higher than the traditional method (19 vs. 13 cases, p=0.0313).
Conclusions: The commonly used disinfecting solutions provide little protection from contamination of contact lens storage cases. Prophylactic treatment with broad range antibiotics may be advisable prior to refractive procedures especially in candidates who are contact lens wearers.

LONG TERM CHANGES IN THE CYLINDER POWER OF HYPERMETROPIC CHILDREN WITH AND WITHOUT ACCOMODATIVE ESOTROPIA

(1) * DR. WYGNANSKI-JAFE TAMARA (2) MRS. ZWLILLING BEATRICE (2) DR. LEIBA HANA
(1) SHEBA MEDICAL CENTER (2) KAPLAN MEDICAL CENTER

Introduction: Lambert and Lynn suggested that cylinder power increases in children with accommodative esotropia treated with spectacles. We analyzed the changes in cylinder power of spectacle wearing hypermetropic children with and without esotorpia.
Patients / Methods: Refractive errors were followed in 108 children with hypermetropia with and without esotropia for a mean of 3.9 years. Cycloplegic refractions were performed by retinoscopy. The refractive data was analyzed for the entire group and according to age of spectacle prescription, and ocular alignment.
Results: The mean cylinder power increased on average by 0.16 D. In the youngest age group (0<2 years) the mean increase was 0.3 D, in the second group (2<4 years) 0.2D,and in the third group (>4 years) 0.08 D. There was a tendency towards a larger average increase in astigmatism in the accommodative esotropes.
Conclusions: Similar to the results reported by others, we found a slight increase in cylinder power which more substantial amongst patients under the age of two. Nevertheless, this change although statistically significant is probably of no clinical importance. In children wearing spectacles for hypermetropia with and without esotropia, astigmatism increases minimally. Cylinder power changes were more common in the accommodative esotrope group.

CLINICAL AND HISTOLOPATHOLOGICAL ANALYSIS OF CORNEAL INTRASTROMAL ANTIBIOTIC INJECTIONS IN THE RABBIT CORNEA

(1) * DR. LICHTER HENIA (1) DR. JAFRI BATOOL (1) DR. GROSSNIKLAUS HANS (1) DR. BANNING CHRISTOPHER (1) DR. SONG DIANE (1) DR. GARCIA-VALENZUELA ENRIQUE (2) DR. BAHAR IRIT (1) DR. EDELHAUSER HENRY (1) EMORY UNIVERSITY, ATLANTA, GA, USA (2) RABIN MEDICAL CENTER, PETAH TIQWA, ISRAEL

Introduction: The purpose of the study was to investigate the safety and side effects of intrastromal antibiotic injection in an animal eye model.
Patients / Methods: Five series of rabbits (4 eyes each) underwent corneal intrastromal injection of vancomycin 50 mg/ml, gentamycin 14 mg/ml, amphotericin B 5 mg/ml, or balanced salt solution (control). 0.1 ml was injected 2 mm from the limbus at the temporal side. The corneas were examined and photographed for 3 weeks, and then harvested for light and electron microscopy.
Results: Intrastromal white haze was immediately visible at the site of injection in all corneas. By 3 weeks, the haze from the injection had disappeared in all eyes except those injected with vancomycin. Amphotericin B left yellowish deposits in 2 eyes which we attributed to the color of the amphotericin B solution. In one eye, superficial corneal neovascularization developed after injection with > 0.1 ml amphotericin B. No lens or anterior segment abnormalities were seen. With the exception of amphotericin B series, which revealed inflammatory cells in 2 eyes and vascularization in one, light and electron microscopy revealed a normal histologic picture and reactive keratocytes.
Conclusions: Corneal intrastromal injection of antibiotics causes no - some adverse effects. It may serve as a useful mode of therapy for deep corneal infections that is refractory to topical treatment.

STRUCTURE-FUNCTION RELATIONSHIP IN GLAUCOMA – A STUDY IN UNILATERAL PSEUDOEXFOLIATION GLAUCOMA

(1) * DR. BARKANA YANIV (2) DR. BURGANSKY-ELIASH ZVIA (1) DR. AVNI ISAAC (1) DR. KAPLAN AUDREY
(1) DEPARTMENT OF OPHTHALMOLOGY, THE ASSAF HAROFE MEDICAL CENTER, ZERIFIN (2) DEPARTMENT OF OPHTHALMOLOGY, THE EDITH WOLFSON MEDICAL CENTER, HOLON

Introduction: It is still not known precisely how much nerve tissue has been lost when a certain visual field defect is present in an eye with glaucoma. The ability of structure-function studies to answer this question is limited by the large variability in anatomical parameters in the normal population. In this study we correlated the amount of RNFL loss and amount of visual field (VF) loss in patients with truly unilateral glaucoma that is secondary to unilateral pseudoexfoliation syndrome (PXS).
Patients / Methods: Patients with unilateral PXS and inter-eye IOP difference of at least 5 mmHg were enrolled. In all patients, visual function was assessed with SITA-standard 24-2 perimetry, and RNFL thickness was assessed from imaging with Stratus OCT. Percent RNFL thickness loss relative to the healthy eye was correlated with mean deviation (MD).
Results: 16 patients were enrolled. MD in the eye with PXS ranged –0.97 to -18.3 dB. RNFL average ranged 41 to 103 microns in the PXS eye and 84 to 102 microns in the fellow eye. There was a threshold of ~50% RNFL thickness loss below which a whole- or hemi-field visual field defect was not demonstrated. Above this threshold there seemed to be a linear relationship between MD (in dB) and % RNFL thickness loss. Visual field defect without RNFL thinning was not observed.
Conclusions: Unilateral PXS allows the study of structure-function relationship while eliminating "noise" from inter-individual anatomic variability. We observed a large range of RNFL thickness loss that preceded field loss. The observed structure-function relationship provides useful information for patient counceling and glaucoma research. Our results also support a potential role for OCT as a sensitive diagnostic modality in the early "pre-perimetric" diagnosis of glaucoma and emphasize the need for more sensitive modes of perimetry.

DIASTOLIC DOUBLE PRODUCT IN NORMAL TENSION GLAUCOMA - A NEW ENTITY TO CONSIDER

(1) * DR. NESHER RONIT (1) DR. SHULMAN SHIRI (2) PROF. NESHER GIDEON (3) DR. KOHAN RICARDO (4) PROF. HARRIS ALON
(1) DEPARTMENT OF OPHTHALMOLOGY, MEIR MEDICAL CENTER, KFAR SABA, ISRAEL, SACKLER MEDICAL SCHOOL, TEL AVIV UNIVERSITY, TEL AVIV, ISRAEL (2) DEPARTMENT OF INTERNAL MEDICINE, SARRE ZEDEK MEDICAL CENTER, HEBREW UNIVERSITY MEDICAL SCHOOL, JERUSALEM, ISRAEL. (3) DEPARTMENT OF INTERNAL MEDICINE, CARMEL HOSPITAL, HAIFA, ISRAEL (4) DEPARTMENT OF OPHTHALMOLOGY, INDIANA SCHOOL OF MEDICINE, INDIANA, USA

Introduction: Nocturnal hypotension with dramatic falls in blood pressure (i.e. nocturnal dips) has been described to occur more frequently in patients with NTG. The capability to autoregulate blood flow secures tissue perfusion to essential organs. In NTG auto-regulation has been shown to be impaired. The double product (DP) is a known entity that was initially introduced to describe cardiac workload. It is calculated by multiplying the systolic blood pressure by the heart rate. DDP - diastolic double product, calculated by multiplying diastolic blood pressure by heart rate may serve as an indicator of tissue perfusion when autoregulation is impaired.
Patients / Methods: 11 NTG patients, mean age (53+10) with episodic symptoms suggestive of hypotension enrolled in the study. 24-hour monitoring of blood pressure (BP) and heart rate (HR) was performed in each case. The diastolic and systolic double product (DDP and SDP) at each reading were calculated by multiplying the HR by the respective BP. DDP<3600 and SDP<5400 were considered abnormally low. DDP<3000 and SDP<4700 were considered moderately abnormal, and DDP<2500 and SDP<4000 were considered severely abnormal.
Results: DDP was low in all 11 patients in at least one reading, mostly during nighttime. In 8 pts this decrease lasted at least 1 hour. The mean number of abnormally low readings was 8.9+7.3 per patient. Moderately abnormal DDP readings were recorded in 9 patients (in 6 lasting more than 1 hour), and severely abnormal readings were observed in 6 patients (lasting more than 1 hour in 2 pts). Abnormally low SDP was present in 8 patients. The mean number of abnormally low SDP readings was 4.7+6.5 per patient. Moderately abnormal SDP readings were recorded in 6 patients. Severely abnormal SDP readings were observed in 3 patients .
Conclusions: Abnormally low DDP was recorded in all patients, lasting more than an hour in most cases. Abnormally decreased DDP, contemplating both the BP and HR, may represent a state of low ocular perfusion in this subgroup of NTG patients. The role and value of DDP recordings should be evaluated in larger-scale controlled studies of NTG patients, combining DDP with ocular blood flow measurements.

EFFECT OF PARA-AMINOBENZOIC ACID ON THE COURSE OF RETINAL DEGENERATION IN RD10 MICE

(1) * DR. GALBINUR TURAL (1) DR. OBOLENSKY ALEXEY (1) DR. CHOWERS ITAY (1) DR. BANIN EYAL
(1) DEPT. OF OPHTHALMOLOGY, HADASSAH-HEBREW UNIVERSITY MEDICAL CENTER, JERUSALEM

Introduction: Recent evidence supports a role for oxidative injury in the pathogenesis of retinal degenerations. Para-aminobenzoic acid (PABA) is a cyclic amino acid belonging to the Vitamin B group and may act to decrease oxidative injury and lipid peroxidation. Our aim was to evaluate the efficacy of PABA in reducing the rate of retinal degeneration in the rd10 mouse model of retinitis pigmentosa.
Patients / Methods: Twenty-five rd10 mice were used. Intraperitoneal injections of PABA (50mg/kg) were performed 6 times per week during the first 6 weeks of life. Control mice were similarly injected with saline. At 3 and 4.5 weeks of age, electrophysiological (full field electroretinogram – ERG) and quantitative histological techniques were used to assess the course and extent of retinal degeneration.
Results: Dark adapted mixed cone-rod ERG responses were higher in PABA-treated rd10 mice as compared with saline-injected animals at both the 3 and 4.5 week time points (mean b-wave amplitude at highest stimulus intensity at 3 weeks: 304.3±27.2 microvolt versus 223.2±37.8 microvolt in saline-injected mice; at 4.5 weeks: 206.7±27.3 microvolt versus 165.3±37.5 microvolt) (mean±SEM). At 4.5 weeks, thickness of the outer nuclear layer (ONL) was markedly better preserved in the peripheral retina of PABA-treated mice as compared with saline-injected controls (10.80±0.94 microns versus 8.60±0.64 microns, p=0.017). Correspondingly, the number of photoreceptor nuclei rows in the peripheral ONL was significantly versus 1.89±0.23 rows in higher in the PABA-treated group (2.63±0.24 rows saline-injected controls, p=0.018). There was a trend towards a thicker ONL with more photoreceptor nuclei rows in the central and mid-peripheral retina of PABA-treated mice.
Conclusions: PABA treatment may slow the course of retinal degeneration in rd10 mice with relative preservation of retinal function and structure. We hypothesize that this rescue effect is mediated by the anti-oxidant properties of PABA.

ENHANCED S-CONE SYNDROME WITH HEARING LOSS - A POSSIBLE NEW SYNDROME.

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Introduction: The genetic analysis, Electroretinogram (ERG) and Optical Coherence Tomography (OCT) findings in a family with Enhanced S-Cone Syndrome and hearing loss.
Patients / Methods: Two of ten siblings, Forty-five years old man with visual acuity of 2/20 in both eyes and his forty-one years old brother with visual acuity of 0.5/20 in both eyes had reduced central vision, photophobia and hearing loss. The parents were first order cousin of Arab origin. ERG was performed (LKC, UTAS-3000) according to the ISCEV protocol. Stratus OCT 3 (version 4.0.1) scans and Auditory Brainstem Evoked Response (ABR) were performed. Mutation analysis of the NRE2E3 gene was performed by direct sequencing of PCR amplified exons.
Results: The photopic ERG results showed non-detectable wavelength amplitude for the 30Hz flicker and long wavelength single flash stimuli, while the white and the short wavelength single flash stimuli were remarkably higher (b wave: 50-60 microvolt). Scotopic responses were within the normal limits. The OCT results showed in the macular area loss of normal neuroretinal contour and loss of normal neuroretinal architecture with severe thinning of the photoreceptor layer and absence of the outer and inner segments of the photorecepter layer. ABR of wave III and V showed delayed latencies in both ears. No pathogenic mutation was identified in the coding region or in the exon-intron boundaries of the NRE2E3 gene. However the possibility of a mutation in the non-coding regions, a large deletion, or a rearrangement has not been ruled out.
Conclusions: Enhanced S-Cone Syndrome was diagnosed based on the ERG results with preserved s-cone response and non-detectable L-cone response. The OCT showed thinning of the photoreceptor layer which rationalized with the ERG results. The ABR demonstrated a nero-sensory defect which had not been described in previous reports. However, no pathogenic mutation was identified.

PATHOLOGICAL MECHANISMS LEADING TO EPIPHORA AND OTHER OCULAR MANIFESTATIONS RELATED TO WEEKLY ADMINISTRATION OF DOCETAXEL

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Introduction: Epiphora due to canalicular stenosis is a recently described side effect of weekly docetaxel. We prospectively evaluated the incidence of this complication and other ocular manifestations in patients treated at our medical center. Pathological specimens of conjunctiva were taken in order to investigate the possible mechanisms of docetaxel toxicity.

Patients / Methods: Twenty one consecutive patients (breast cancer: 14; metastatic non-small cell lung cancer: 6; metastatic nasopharyngeal carcinoma: 1) (female/male: 14/7; age range 34-78 years) were treated with weekly docetaxel (35mg/m2/wk iv for 6 weeks, cycles repeated every 49 days). A standard questionnaire regarding epiphora was completed before each dose of docetaxel. Patients who complained of excessive tearing underwent a thorough ophthalmologic evaluation before receiving the next dose. Patients that were treated surgically – underwent conjunctival biopsy.

Results: Epiphora due to stenosis of lacrimal puncti and canaliculi developed in seven (33%) patients following a cumulative dose of 208-645 mg/m2 (median: 400 mg/m2). Two patients developed complete canalicular stenosis requiring surgery (dacryocystorhinostomy). Epiphora was accompanied by madarosis and ectodermalization of the palpebral and bulbar conjunctiva in 5 patients. Treatment was discontinued due to epiphora in 2 (10%) patients. After median follow up of 11 months, four patients still had epiphora. Conjunctival pathology showed thinning of epithelial lining and depletion of goblet cells.

Conclusions: Epiphora due to canalicular stenosis is a frequent complication of weekly docetaxel and might be dose limiting. Possible mechanisms for this complication are discussed – in light of the pathology findings. Irreversible damage requiring surgical intervention may develop despite close monitoring. The potential risk of canalicular stenosis should be carefully weighed against the theoretical benefit of weekly decetaxel, which is mainly less myelosuppression. Conjunctival pathologic changes can contribute to epiphora, and may simulate changes in the lacrimal excretory system mucosa.

TRANSPLANTATION OF RPE DERIVED FROM HUMAN EMBRYONIC STEM CELLS IN ALBINO AND DYSTROPHIC RAT EYES

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Introduction: Replacement and support of dysfunctional Retinal Pigment Epithelium (RPE) may have therapeutic benefit in diseases such as Age Related Macular Degeneration and subtypes of Retinitis Pigmentosa. Human Embryonic Stem Cells (hESCs) may serve as an unlimited source for such cells. Last year we reported the efficient generation of RPE from hESCs in-vitro. In the present study we transplanted such cells into the eyes of albino rats and RCS rats with a Mertk gene mutation which serve as a model for retinal degeneration caused by RPE dysfunction. Viability of the transplanted cells and their effects on the host retina were examined.
Patients / Methods: Sixty-six RCS and albino Sprague-Dawley rats were used. Differentiation of hESCs was induced by culturing embryonic bodies (EBs) in suspension for at least 4 weeks (4w). Clusters of pigmented cells within the EBs were mechanically dissected and further cultured. For in-vivo transplantation, a cell suspension enriched with pigmented cells was derived from the cultures and delivered into the sub-retinal or intravitreal space of the right eye of each animal, with the left eye serving as an internal control. Survival of engrafted cells, expression of RPE-specific markers and effects on the host retina were examined by histology and immunohistology up to 8w post-transplantation.
Results: Transplanted cells could be found at different locations, including the sub-retinal (SR) space, intra-retinal (IR), intra-vitreal space (IV) and in mixed locations (IR+IV or SR+IR). Cells survived for at least 8w, with minimal migration from the site of injection. A large proportion of cells maintained pigment and a polygonal shape, and expression of RPE-specific markers such as RPE65, Bestrophin and Mitf-A was observed as well as the tight junction marker ZO-1. Preliminary observations suggest relative preservation of the RCS-host retina in the vicinity of SR and IR grafts but not in eyes with IV grafts.
Conclusions: hESCs can give rise to pigmented cells in-vitro which demonstrate an RPE-like morphology and express RPE-specific markers. Following intraocular transplantation, cells survive for at least 8w and maintain their RPE-like qualities. This may be a first step towards the future use of hESC as an unlimited source for renewing degenerating RPE cells.

COMPARATIVE STUDY OF THE OUTCOMES OF DEEP LAMELLAR KERATOPLASTY (DALK) VS PENETRATING KERATOPLASTY (PK)

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Introduction: Deep Anterior Lamellar Keratoplasty is currently used as an alternative surgical procedure in the treatment of Keratoconus and corneal stromal scars. Limited information regarding the outcom of this procedure is available. The purpose of this study was to compare the outcomes and complications of deep anterior lamellar keratoplasty (DALK) and penetrating keratoplasty (PK).
Patients / Methods: The clinical notes of 28 eyes of 26 patients clinically diagnosed with keratoconus or deep stromal scars who had received DALK or PK at the Toronto Western Hospital between 2003- 2005, were reviewed. The surgery was performed by one surgeon. Deep lamellar keratoplasty was performed with the Melles technique . Penetrating Keratoplasty was performed with standard technique using a Hanna trephine. The main outcome measures were best corrected visual acuity, contrast visual acuity, refractive results and complications were analyzed.
Results: The groups were comparable for age, sex and preoperative visual acuity. There was no significant statistical difference in the proportion of patients achieving 20/40 or better between the PK and DALK groups (57.1 % vs 54.5% p= 0.078). The proportion of patients achieving contrast acuity equivalent of 20/40 or better at 50% (Log CS 0.3) and 25% (Log CS 0.7) contrast levels were higher in the PK group however this difference was not statistically significant (50% vs 60% p= 0.086 and 67% vs 79% p= 0.088 respectively). The median result of the final spherical equivalent power in the DALK group was plano while it was mildly myopic in the PK group (-2.38) although the difference was statistically insignificant. Complication rates were similar for DLK and PK. There were four cases of endothelial rejection in the PK group while the two rejection reactions in the DALK group were limited to the stroma.
Conclusions: This study confirms comparable best corrected visual acuity, contrast acuity and refractive results from both PK and DALK in cases of deep corneal scars and keratoconus. DALK appears to be associated with a different rejection pattern which does not involve the endothelial layer.

TRAUMATIC WOUND DEHISCENCE AFTER PENETRATING KERATOPLASTY

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Introduction: The puprose of this study was to assess the patient characteristics, incidence, risk factors, and clinical outcome of traumatic wound dehiscence after penetrating keratoplasty.
Patients / Methods: Retrospective chart review of 15 eyes (14 patients) with traumatic wound dehiscence after penetrating keratoplasty between January 1996 and August 2006, who were operated and managed at the Cornea Service in Hadassah Medical Center.
Results: Of 789 penetrating keratoplasties that were performed between January 1996 and August 2006, 15 eyes (1.97%) of 14 patients had traumatic wound dehiscence. Eleven eyes were operated for keratoconus, 3 eyes had trachoma, and one had corneal graft for a traumatic scar. The mean time from penetrating keratoplasty to trauma was 33 months (range 2 weeks to 16 years). The mean age at time of wound dehiscence was 37 years (range 18–81 years) with a bimodal distribution (12 eyes between years 11 to 40, and the remaining 3 eyes between years 60 to 90). Falls (46.6%) and playing accidents among children (40%) were the most common mechanism of trauma. Home (80%) was the most common place for trauma to occur. All corneal ruptures occurred at the graft-host interface. There was no particular location preference for wound rupture. Vitreous and lens loss were noted in 11 eyes (73%) and retinal complications occurred in 3 eyes (20%).The first surgical procedure included primary wound closure in all eyes, combined with anterior vitrectomy in 7 eyes, and posterior vitrectomy in one eye. A second surgical intervention for retinal complication was needed in 3 eyes. Eight grafts remained transparent, 2 grafts remained edematous, 4 eyes were re-grafted, and one eye was re-grafted twice. One eye went to phthisis. After one year of follow-up, the mean loss of BCVA was 5 lines, one patient had light perception, and 2 patients had no light perception.
Conclusions: Patients with corneal transplants have a life-long risk for wound dehiscence. Traumatic wound dehiscence is more prevalent in younger patients who had penetrating keratoplasty for Keratoconus. The visual outcome is usually poor. Patients must be continuously educated as to the risk of wound rupture after penetrating keratoplasty and as to the necessary precautions.

EVALUATING THE EFFECT OF DICLOFENAC DROPS VS. DEXAMETHASONE DROPS FOLLOWING TRABECULECTOMY WITH MITOMYCIN C + PHACOEMULCIFICATION + POSTERIOR CHAMBER INTRA OCULAR LENS IMPLANTATION SURGERY.

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Introduction: To investigate whether diclofenac drops are effective as steroids in preventing postoperative inflammation and filter fibrosis following combined surgery of trabeculectomy and cataract extraction.
Patients / Methods: This prospective, randomized, masked study includes consecutive patients scheduled for combined surgery of trabeculectomy with MMC and phaco with PC-IOL by Dr. Levkovitch-Verbin. Postoperatively, a masked ophthalmologist examined the patient at 1, 5, and10 days, 3 and 6 weeks, 3, 5, 8 and 12 months. Bleb quality was scored as a function of its height and vascularity. Anterior chamber inflammatory response was evaluated and scored. Patient satisfactory was scored by detailed questionnaire.
Results: Baseline characteristics of the diclofenac (n=19) and steroids(n=20) groups were similar in age, preoperative intraocular pressure (IOP), number of medications and visual acuity (VA). On days 5 and 10 anterior chamber (AC) inflammatory score was similar for both groups in terms of corneal edema, AC cells and flare. At 8 months mean VA of the diclofenac group was 6/9 vs 6/10 in the steroids group, mean IOP 12.8mmHg vs 12.7mmHg, number of glaucoma medications per patient 0.08 vs 0.9 (p=0.059) and bleb quality score of height/wide/vascularity/seidel - 1.8/2.17/1.67/0 vs 1.4/1.38/1.92/0.2 respectively. At 12 months mean VA was 6/10 vs 6/8, IOP 12.8 mmHg vs 13 mmHg, number of glaucoma medications 0.44 vs 0.77 and bleb quality score 2/2/1.89/0 vs 1.6/1.73/1.73/0 respectively. None of these differences was statistically significant, although the difference in number of glaucoma medications at 8 months was almost significant (p=0.059).
Conclusions: This prospective, randomized study found that diclofenac is effective as steroids in managing the postoperative inflammatory response in combined surgeries of trabeculectomy and phacoemulsification. In steroid responders diclofenac can be used safely.

INTRAVITREAL TRIAMCINOLONE ACETONIDE FOR RADIATION MACULOPATHY AFTER PLAQUE RADIOTHERAPY FOR CHOROIDAL MELANOMA

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Introduction: Radiation maculopathy could lead to vision disturbances and vision loss in patient treated with plaque radiotherapy for choroidal melanoma. This study was designed to evaluate the effect of intravitreal triamcinolone acetonide on patients with visually symptomatic radiation-induced maculopathy after plaque radiotherapy for choroidal melanoma. .
Patients / Methods: Prospective, nonrandomized, single-center case series analysis of 31 patients with visually symptomatic radiation-induced maculopathy after plaque radiotherapy for choroidal melanoma. All patients were treated at the Ocular Oncology Service at Wills Eye Hospital of Thomas Jefferson University, triamcinolone acetonide (4 mg/1 mL) was injected through the pars plana into the vitreous cavity using sterile technique. Status of radiation maculopathy and final visual acuity were the main outcome measures
Results: At the time of diagnosis of choroidal melanoma, visual acuity was 20/20 to 20/50 in 90% (n = 28), 20/60 to 20/200 in 10% (n = 3), and 20/400 or worse in none of the patients. The mean radiation dose to the foveola was 5,122 cGy (median, 3,280 cGy; range, 1,000-16,100 cGy). Radiation maculopathy developed at a mean of 22 months (median, 16 months; range, 6-96 months) after plaque radiotherapy. In all cases, the choroidal melanoma was regressed, and there was no retinal detachment or neovascularization of the retina, optic disk, or iris. At the time of diagnosis of radiation maculopathy, visual acuity was 20/20 to 20/50 in 19% (6/31), 20/60 to 20/200 in 58% (18/31), and 20/400 or worse in 23% (7/31) of patients. After intravitreal injection of triamcinolone acetonide, visual acuity was stable or improved in 91% (20/22) of patients by 1 month and 45% (14/31) by 6 months. Mean foveal thickness by optical coherence tomography was 417 microm at injection and 207 microm at 1 month and 292 microm at 6 months after injection.
Conclusions: Intravitreal triamcinolone acetonide can stabilize or improve visual acuity in some patients with radiation-induced maculopathy, but its effect might not be lasting.

ATYPICAL PATTERNS IN SCANNING LASER POLARIMETRY-CLINICAL CORRELATIONS

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Introduction: Atypical birefringence patterns (ABP) are artifactous retinal nerve fiber layer thickness patterns occasionally seen with scanning laser polarimetry (SLP). In this study we set out to identify which clinical correlations might be associated with the occurrence of these atypical patterns.
Patients / Methods: Sixty-one subjects (glaucoma patients, glaucoma suspects and normal individuals) underwent a full ophthalmic eye examination, standard visual field (VF) test and GDx variable cornea compensation (GDx-VCC) SLP examination. One eye per patient was selected for this study. The ABP magnitude was measured in two independent ways: using a built-in support vector machine analysis (typical scan score, TSS), and by a masked experienced observer. We correlated the magnitude of ABP with: gender, age, refractive state of the eye, corneal polarization axis, corneal polarization magnitude, GDx-VCC global parameters (TSNIT and NFI), and the amount of damage seen in the VF, as evident from: the glaucoma hemifield test (GHT), mean deviation (MD) and pattern standard deviation (PSD).
Results: Of the 61 study eyes, 27 (44%) showed an ABP, based on a TSS cut-off <82.5). A very high correlation was found between the TSS score and the masked experienced observer (r-square = 0.80; p-value < 0.001). The following were the only clinical parameters found, on bivariate analysis, to be significantly correlated with the presence of an ABP: age (r-square = 0.086; p-value = 0.02); corneal polarization magnitude (r-square = 0.069; p-value = 0.04); TSNIT (r-square = 0.16; p-value < 0.001).
Conclusions: A correlation was not found between the presence and magnitude of ABP and most clinical parameters evaluated in this study. A low, but statistically significant, correlation was found for age and corneal polarization magnitude (r-square = 0.086 and 0.069, respectively). A low-medium correlation was found for TSNIT (r-square = 0.16), however, we speculate that this might represent a confounding effect, rather than an underlying association. We conclude that none of the clinical parameters investigated in this study appear to be strongly correlated with the presence of an ABP on SLP scans performed using the commercially available GDx-VCC.

SPECTRUM AND THE SUSCEPTIBILITIES OF MICROBIAL ISOLATES IN OCULAR INFECTIONS

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Introduction: The aim of this study was to determine the distribution and antibiotic susceptibility patterns of bacterial strains isolated from patients with eye infections at the Hadassah University Hospital.
Patients / Methods: The study included a survey of all positive eye samples submitted to the microbiology laboratory over a period of 10 years (from 1990 to 2006). Fungal, protozoal, mycoplasma and mycobacteria isolates were excluded from this survey.
Results: 2525 eye samples were received from newborn patients, 3156 from children and 2211 from adult patients. The most common pathogens isolated in newborns were staphylococcus sp (n= 736, 29.1%), streptococcus sp (n=467, 18.5%) and escherichia (332, 13.1%), whereas in children the most common bacteria were haemophilus influenza (n=1417, 44.9%), streptococcus sp (n=712,22.6%) and staphylococcus sp (n=457, 14.5%). Common bacteria in adults included staphylococcus sp (n=747, 33.8%), streptococcus sp (n=387, 17.5%) and pseudomonas (n=278, 12.6%). Gram-positive bacteria were sensitive to vancomycin (99.9%), ciprofloxacin (93.5%), cefazolin (92.2%) and ofloxacin, while gram-negative bacteria were sensitive to ciprofloxacin (95.85%), ofloxacin (94.4%), chloramphenicol (93.8%) and gentamicin (90.6%).
Conclusions: This microbiological survey showed differences in bacterial isolates from ocular tissues among newborns, children and adults. Gram-positive susceptibility was highest for vancomycin and ciprofloxacin, while gram-negative bacteria susceptibility was highest for ciprofloxacin and ofloxacin.

NOVEL PSYCHOPHYSICAL TEST FOR DIAGNOSIS OF AGE RELATED MACULAR DEGENERATION BY IDENTIFICATION OF COMBINED COLOR VISION AND CONTRAST SENSITIVITY DEFECTS

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Introduction: The majority of non-neovascular AMD patients remain undiagnosed and often present to the ophthalmologist only after the neovascular stage of the disease has developed and severe visual loss already occurred. We aim to develop a self-administered psychophysical test for early diagnosis of AMD based on identification of reduced blue color contrast sensitivity.
Patients / Methods: Self-administered set of psychophysical card tests were produced which facilitate identification of tritanopia defects combined with impaired contrast sensitivity. Tests were presented to patients with early AMD (n = 13 eyes), intermediate AMD (n = 21 eyes), neovascular AMD (n = 6 eyes), and unaffected controls (n = 52 eyes). Inclusion criteria included age over 60 years and best corrected visual acuity of 0.5 or better. Blue contrast sensitivity threshold were compared among these groups.
Results: Mean visual acuity was similar between patients and controls. Mean sine-wave gratings (SE) on a modified colored FACT (Functional Acuity Contrast Test) of eyes with intermediate AMD (5.1 ± 0.6) and neovascular AMD (4 ± 1.3) was lower than control eyes (6.8 ± 0.3, $P = 0.006$, ANOVA with Bonferroni correction). Univariant analysis also demonstrated higher mean grating for circle charts that we have developed in control eyes (69 ± 5) compared with eyes with intermediate AMD (53 ± 4.5) and neovascular AMD (21 ± 5, $P < 0.05$, T-test).
Conclusions: This study supports the idea that blue color contrast sensitivity is gradually reduced during the course of AMD despite preservation of visual acuity. The novel tests that we have developed may serve as a valuable adjunct screening test to identify individuals with intermediate AMD.

TRANSIENT MACULAR THICKENING AFTER PHACOEMULCIFICATION SURGERY

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Introduction: Previous studies have demonstrated that macular thickening occurs shortly after cataract surgery by phacoemulcification. We investigated the change in macular thickness over time following uncomplicated phacoemulsification.
Patients / Methods: 30 nonconsecutive patients with best-corrected visual acuity of 20/30 or better after uneventful phacoemulcification were included. Excluded were patients with diabetes, myopia, macular pathology, glaucoma and uveitis. Macular thickness in the operated eye and non-operated fellow eye was measured with the optical coherence tomography (OCT) 1 and 6 months postoperatively..
Results: The mean (+/- SE) foveal thickness in the operated eyes at 1 month postoperatively was 203.5+/-11 micron and decreased to 187.1+/- 9 micron at 6 month ($p< 0.023$). The mean (+/- SE) macular volume of the operated eyes at 1 month was 7.1+/-0.15 mm3 and it decreased to 6.9+/-0.13 mm3 at 6 month ($p< 0.002$). There were no similar changes in the non-operated eyes,.
Conclusions: OCT measurements demonstrated that the subclinical macular thickening present at 1 months after phacoemulsification decreased spontaneously at 6 months following surgery.

RETINAL NERVE FIBER LAYER (RNFL) THICKNESS AND MACULAR THICKNESS IN PATIENTS WITH MULTIPLE SCLEROSIS

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Introduction: The purpose was to compare the RNFL thickness as measured by Optical Coherence Tomography (OCT) among Multiple Sclerosis (MS) eyes with a history of optic neuritis (ON), MS fellow eyes, and MS eyes without a history of ON.
Patients / Methods: Twenty five patients with definit MS who have not experienced ON during the past six months were evaluated. Group one: 12 patients who experienced ON more than 6 months ago (15 affected and 9 non- affected [fellow] eyes). Group two: 13 patients without a history of ON in either eye (26 non-affected eyes). Patients with other eye diseases were excluded. All patients underwent OCT measurements, which included macular evaluation (Fast Macular Thickness scan) and peripapillary retinal nerve fiber layer (RNFL) thickness evaluation (RNFL 3.4 mm scan).
Results: Group one: RNFL thickness of affected eyes appeared to be non-significantly lower than that of their fellow eyes (84.2+/- 16 and 95.9+/- 10 microns respectively, $p< 0.053$), but there was a significant difference in macular volume of the same eyes (6.39+/- 0.4 mm3 and 6.77+/- 0.4 mm3 respectively, $p< 0.016$). No such changes were found comparing the two non-affected eyes of each patient in group two. RNFL thickness and macular volume were significantly lower in affected eyes (group 1) comparing to non-affected eyes (group 2): (84.03+/- 17 and 100.41+/- 11 micron, $p< 0.024$ and 6.5+/- 0.5 mm3 and 6.9+/- 0.4 mm3 respectively, $p<0.007$). When fellow, non-affected, eyes of patients of group 2 were compared to the non-affected eyes of patients of group 1 no significant differences in macular volume or RNFL thickness were found.
Conclusions: ON causes atrophy of RNFL around the optic disc. Apparently, it seems that macular thinning also occurs following the attack of ON.

STRUCTURAL ABNORMALITIES OF THE CORNEA AND LID RESULTING FROM COLLAGEN V MUTATION IN EHLER DANLOS SYNDROME TYPE I

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Introduction: Type V collagen forms heterotypic fibrils with type I collagen and accounts for 10-20% of corneal collagen. The purpose of this study was to define the ocular phenotype resulting from mutations in type V collagen genes, COL5A1 and COL5A2, and to study the pathogenesis of anomalies in a col5a1 deficient mouse.
Patients / Methods: Seven patients with classical Ehlers Danlos syndrome (EDS) due to COL5A1 haploinsufficiency and one with an exon skipping mutation in COL5A2 underwent an ocular examination, corneal topography, pachymetry and specular microscopy. A col5a1 haploinsufficient mouse model of classical EDS was used for biochemical and immunochemical analyses of corneas. Light and electron microscopy were utilized to quantify stromal thickness, fibril density as well as fibril structure and diameter.
Results: Five males and three females (mean age: 26±13.57yrs; range:11-52yrs) were studied. All patients had “floppy eyelids”. The cornea of all cases were thinner (mean corneal thickness: 435.75±12.51µm) when compared with controls (568.89±28.46µm, $p<0.0001$). In the col5a1 +/- mouse cornea, type V collagen content was reduced by ~49%, while stromal thickness was reduced by ~26%. Total collagen deposition in col5a1+/- corneas also was reduced. Collagen fibril diameters were increased, while fibril density was decreased throughout the stroma at all developmental stages.
Conclusions: In the eye, COL5A1 and COL5A2 mutations manifest as abnormally thin and steep corneas with floppy eyelids. Mechanisms involved in producing the latter anomalies likely involve altered regulation of collagen fibrillogenesis due to abnormalities in heterotypic type I/V collagen interactions similar to those observed in the col5a1+/- mouse cornea.

CAN IVIG INHIBIT FORMATION OF TUMOR BY INSEMINATED CELLS IN AN EYE MODEL ?

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Introduction: Intravenous Ig (IVIg) is currently used to treat patients suffering from autoimmune conditions. Studies done on laboratory animals inoculated i.v. with melanoma or sarcoma cells and treated with IVIg induced a statistically significant inhibition of metastatic lung foci and prolongation of life. Purpose: To evaluate the inhibitory potential of IVIg on inseminated tumor cells by preventing tumor formation.
Patients / Methods: An animal eye model was used in the presented study. The cornea of albino New Zealand rabbit was used as site for tumor cells insemination. Under general anesthesia according to ARVO Rules for Animal Care and under the Animal CARE Committee Approval, a concentration of 5,000 cells per micro liter was injected sub epithelium of cornea.The site of the injection was close to the sclera-corneal border at the site of superior rectus muscle insertion. A volume of 2 micro liters was injected. Three groups of rabbits were included in the study: cornea inseminated with CT26 tumor cells, cornea inseminated with CT26 tun\mor cells and IVIg and cornea inseminated with CT26 tumor cells with PBS . At an interval of two days , two more injections of IVIg and PBS respectively were injected. The eye were examined at slit lamp under deep anesthesia every second day up to 10 days from the beggining of the study.
Results: In the corneas inseminated with tumor cells and not treated, a rich vascular bed was formed and at 10 days it covered almost the whole surface of the injected block of cells. In the IVIg injected corneas and tumor cells the amount of vascularisation was poor and the volume of the tumor cells was reduced. The PBS injection did not affect the development of the vascularisation and the aspect was identical to the non-treated corneas.
Conclusions: IVIg has an inhibitory effect on the development and organization of inseminated tumor cells in the cornea. It may have a topical application in inhibition or destruction of local intra ocular tumors.

NEURONAL CORRELATES OF BINOCULAR PROCESSING MANIPULATING MONOCULAR PERCEPTION

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Introduction: In our previous study bias in perceived grouping was examined in conditions where the two eyes receive different spatial external distortion.
Patients / Methods: Stimuli, 10x10 dots matrix with Horizontal and Vertical spacing defining the direction of grouping (V/H), were presented, in random order either to both eyes (binocular), or only to one (monocular), while the other was exposed to background luminance. Cylindrical lenses were used to introduce a constant distortion along one direction. Bias and reaction times (RT) were measured under dichoptic conditions, including monocular and binocular presentations with or without orthogonal distortions between the eyes. Event-related potentials (ERPs) were recorded to find neuronal correlates of the interplay between the two levels of processing.
Results: Behavioral results showed that without distortion there was no bias, with sharp transitions between V/H groupings, while RT increased at the transition, with binocular RT being slower than monocular by 160 ms (N=14). Orthogonal distortions between the eyes showed no binocular bias but large monocular bias (N=10). Monocular distortions showed a bias in the treated eyes, while untreated eyes showed orthogonal bias (N=11). Binocular RT was slower than the monocular by 150 ms. The bias with the dichoptic presentation was found to be the average of the two opposite monocular groupings.
Conclusions: The findings of slower binocular RT and of monocular distortion bias in the untreated eye suggest that binocular processing affects monocular perception. The ERPs provide the neurophysiological basis for observed behavioral effect.

POSTER SESSION 2

HAPTOGLOBIN GENOTYPE AND RETINOPATHY OF PREMATURITY

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Introduction: Oxidative stress is thought to play a major role in the pathogenesis of the retinopathy of prematurity (ROP). Haptoglobin (HP) is a polymorphic antioxidant protein and its different allelic protein products differ in their antioxidant capacity. Previous studies have shown that patients with 1-1 HP genotype have lower prevalence of diabetic retinopathy while patients with the 2-2 HP genotype have higher prevalence of atherosclerotic coronary artery disease. We therefore sought to investigate a possible role of the HP genotype in the development of ROP in human subjects.
Patients / Methods: This study was carried out in an institutional setting in 2 medical centers during a 36-month period. All the patients diagnosed or referred because of ROP in one or 2 eyes were included in the study group: n=34; 53% Jews; 47% Arabs; 56% Males, 44% females, GA 26.7 ± 1.9 wks; BW 895 ± 192 g. A group of adult patients treated for other ocular diseases and not having ROP in either eye served as control, representing the general population: n=185; 88% Jews; 12% Arabs; 49.2% Males, 50.8% females. HP genotype was determined by PCR from blood samples drawn from all participants. The main outcome measure was the distribution of the different HP genotypes in the study and control groups.
Results: In the ROP group and in the control group, there were no intra-group differences between Arabs and Jews as to the distribution of the 3 different HP genotypes. The relationship of ROP to HP genotypes is shown in Table. The difference between the ROP and the control groups regarding the distribution of the HP genotypes was not significant (p=0.098). Compared to controls, 1-1 HP genotype was marginally higher (p=0.07) in the ROP group than genotypes 2-1 and 2-2 together. HP Genotype ROP(n=34) Control(n=185) 1-1 7(20.6%) 17(9.2%) 2-1 15(44.1%) 77(41.6%) 2-2 12(35.3%) 91(49.2%)
Conclusions: Compared to controls, ROP patients had a trend towards a higher frequency of the 1-1 HP genotype and a lower frequency of 2-2 HP genotype. Our results suggest that the HP genotype might have an effect on the prevalence of ROP.

PREVENTION OF DIABETIC DAMAGE TO INTACT BOVINE LENS IN CULTURE USING ANTIOXIDANTS

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Introduction: Purpose: To investigate the mechanisms involved in diabetic cataractogenesis and the effects of antioxidants in preventing glucose damage to the eye lens.
Patients / Methods: Methods: Bovine lenses were exposed in organ culture to 450 mg % glucose, which simulates acute diabetes. Other lenses were exposed to 450 mg% glucose including antioxidants: Lutein, Desferrioxamine (DFO) or N-acetyl-L- cysteine (NAC). Control lenses were incubated without glucose or antioxidants. Other controls were incubated with each antioxidant without glucose. Incubation time was 15 days. Lens optical quality was assessed throughout the 15 days of the culture using our unique laser system. At the end of the culture period, lenses were analyzed by inverted microscopy and the lens epithelial layer was used for histochemical analysis.
Results: Results: High levels of glucose in the culture medium caused optical and morphological damage to bovine lenses. Antioxidants reduced the damage caused by high glucose levels. The activities of the enzyme hexokinase were increased significantly in the presence of glucose.
Conclusions: Conclusions: High glucose levels causes damage to the eye lens. The lens itself is able to correct part of the optical damage. The 3 antioxidants partially protect the lens from damage caused by high glucose levels. NAC which enhances GSH-dependent intracellular defenses and decreased the inflammatory response protected the eye lens better than Lutein and DFO. This study was supported in part by Guzik Ophthalmology Research Fund.

INTERACTION OF TEMPORAL AND SPATIAL FREQUENCY IN THE CONTRAST TRANSFER FUNCTION OF THE PATTERN ELECTRORETINOGRAM

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Introduction: It was accepted that the amplitude-vs.-contrast (amp/cont) function of the pattern-electroretinogram (PERG) is linear. Recording the PERG at varying temporal stimulation frequencies (Zapf and Bach, 1999) found that this needs to be qualified. The amp/cont is indeed linear at 7-rps, but becomes progressively non-linear at higher temporal-frequencies (TF). This finding was unexpected as it clashes with hypotheses linking the PERG generators to the magnocellular system. The aim of this study was to evaluate the amp/cont function of the PERG at different TF and spatial-frequencies (SF), and at different contrast levels.
Patients / Methods: A preliminary study was conducted in which we determined the TF for the experiment's settings. In each eye, we recorded PERGs at 4 different TF (7.5, 19, 25 and 38-rps) and 2 contrast levels (50%, 100%). The TF that yielded high non-linear amp/cont function (19 rps) was chosen for the two subsequent experiments. First, we recorded responses to 4 different check sizes (0.21°, 0.38°, 1.6° and 18°) presented at 19 rps. At each check size, two different contrast settings (50% and 100%) were used. These recordings were used to evaluate the effect of SF on the amp/cont function. Second, we recorded PERG responses to stimuli of constant SF (0.81°) and TF (19 rps) at 5 different contrast levels (between 25-100%). These recordings were used to evaluate the effect of contrast on amplitude.
Results: In the preliminary study, the amp/cont function was linear for the lowest TF used (7.5 rps). The linearity "broke" at the higher TFs, with a greatest break from linearity evident at 19-rps. Thus, we chose this frequency for the two subsequent experiments. In the first experiment, recordings using SFs of 0.21° and 18° resulted in an amp/cont function that was nearly linear. The three intermediate SFs yielded functions that were exponential. In the second experiment, the amp/cont function was linear at contrast settings < 50%, and exponential thereafter.
Conclusions: The amp/cont ratio is not linear as was previously thought. In this work we showed that the amp/cont function depends on 3 factors: the TF, SF and contrast. Together, these three parameters determine whether the function is linear or exponential.

CHROMOSOME 3 ABERRATIONS PRECEDE THE DEVELOPMENT OF NETWORK EXTRAVASCULAR MATRIX PATTERN IN UVEAL MELANOMA

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Introduction: Monosomy of chromosome 3 and network extravascular matrix patterns are associated with death of uveal melanoma (UM) patients. Networks are typically found in confined area within the tumor while the intratumor distribution of chromosome 3 aberrations is unknown. We aim to assess the spatial correlation among chromosome 3 aberrations and networks in UM.
Patients / Methods: Extravascular matrix patterns, proliferative activity, and cell type were characterized in 15 primary UM. Cells were isolated using laser capture microdissection (LCM) from two tumor regions and one normal retina area from each tissue block. In the eight tumors containing networks cells were microdissected from one area with networks and another area without networks. In seven tumors without networks cells were microdissected from two distinct tumor areas. Presence of chromosome 3 aberrations was assessed using microsatellite analysis in each LCM sample (MSA).
Results: Useful MSA data was obtained from 43 of the 45 samples. Monosomy 3 was detected in 16 samples from eight tumors. There was no intratumor heterogeneity in terms of monosomy 3 regardless of existence of heterogeneity in terms of networks, cell type, or proliferative activity across the two samples from the same tumor. Networks were associated with monosomy 3 on the whole tumor level ($p = 0.005$)
Conclusions: While monosomy 3 is associated with network pattern it does not account for intratumor heterogeneity in terms of network pattern location. Thus, monosomy 3 aberrations precede the development of network patterns and may contribute but are not sufficient for its development.

EVALUATING SUPPRESSION OF NONSENSE MUTATIONS BY AMINOGLYCOSIDE ANTIBIOTICS AS AN INTERVENTION FOR VISION LOSS IN TYPE I USHER SYNDROME

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Introduction: Type 1 Usher syndrome (USH1) is a recessively-inherited condition, characterized by profound prelingual deafness, vestibular areflexia, and prepubertal onset of retinitis pigmentosa (RP). While the auditory component of USH1 can be treated by cochlear implants, to date there is no effective treatment for RP. USH1 can be caused by mutations in each of at least seven genes. While truncating mutations of these genes cause USH1, missense mutations of some of the same genes cause only nonsyndromic deafness. These observations suggest that partial or low level activity of the encoded proteins may be sufficient for normal retinal function, although not for normal hearing. Interventions to enable at least some translation of full-length protein, may delay the onset and/or progression of RP in individuals with USH1 due to nonsense mutations. One such possible therapeutic approach is suppression of nonsense mutations by small molecules such as aminoglycoside antibiotics.
Patients / Methods: Suppression of nonsense mutations was initially tested in vitro, using a transcription/ translation assay of a reporter plasmid harboring various nonsense mutations of the PCDH15 gene, underlying USH1F. One of these mutations is R245X, which we recently identified as a major cause of USH1 in Ashkenazi Jews. Ex vivo suppression of these mutations is tested using expression constructs transfected into cultured cells. In addition, we are currently developing an R245X knock-in mouse. This mouse will serve as a model for testing suppression by aminoglycoside antibiotics in vivo. In parallel, we are developing a series of new aminoglycoside-derived compounds, which will maintain their suppressive activity, while having reduced toxicity.
Results: Using an in vitro suppression assay we demonstrated up to 91% suppression of PCDH15 nonsense mutations by commercial aminoglycosides. We also demonstrated ex vivo suppression of the R245X mutation by G418. To date we have tested over 35 new compounds for their in vitro suppression properties. Cellular toxicity assays are being performed on several compounds for which encouraging results have been obtained.
Conclusions: The research described here will have important implications for development of targeted interventions that are effective for patients with USH1 and nonsyndromic RP caused by various nonsense mutations.

HISTOLOGICAL CRITERIA FOR GRADING OF ATYPIA IN MELANOCYTIC CONJUNCTIVAL LESIONS

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Introduction: To develop a standardized protocol for grading atypia in order to evaluate melanocytic conjunctival lesions (MCL), mainly primary acquired melanosis (PAM) and inflamed juvenile conjunctival nevi (IJCN), and to establish prognostic parameters for progression to malignant melanoma (MM).
Patients / Methods: Patients with MCL removed between 1980 and 2001 at the Hadassah University Hospital, Jerusalem were included. We reviewed clinical charts and histologic slides of 304 patients with MCL diagnosed as nevus (222 cases), PAM (35 cases), IJCN (40 cases) and MM (5 cases). The emphasis of this study was to establish a scoring method of atypia for IJCN and PAM, according to the following histologic parameters: nest cohesion, melanocytic hyperplasia, nuclear features and pagetoid spread and to compare to clinical follow-up. Each histologic criterion was assigned a score from 0-2 and then the degree of atypia of each case was determined from the overall histologic score. Immunostaining using HMB-45, MART-1, S-100, Ki-67, LCA, CD3, and CD20 antibodies was performed.
Results: The degree of atypia of the PAM lesions was mild (score 1-2) in 28% (8/29), moderate (score 3-4) in 10% (3/29), severe (score >5) in 10% (3/29), and 52% (15/29) of PAM lesions were without atypia. All of the IJCN were only with architectural disorder (score 2). There were no recurrences in the IJCN and PAM without and with mild atypia, while 67% (2/3) of PAM with moderate atypia recurred. All three lesions of PAM with severe atypia (100%) recurred with development to MM. Immunostaining helped to evaluate pagetoid spread and maturation of melanocytes, and lymphocytes population. Ki-67 stained >5% of the melanocytes in all MM and one PAM with severe atypia, 1-5% in other PAM with severe atypia and negative or <1% of the melanocytes in other MCL. The criteria for evaluation of atypia were found to be significantly associated with the clinical outcome ($p<0.0001$).
Conclusions: The standardized histologic scoring protocol of MCL is reliable. Adherence to this routine will contribute to a reduction in the confusion of a benign MCL such as IJCN with a potentially preneoplastic one and should be useful in predicting which lesions of PAM will progress to MM.

ABETALIPOPROTEINEMIA IN ISRAEL: A FOUNDER MUTATION IN THE ASHKENAZI JEWISH POPULATION AND A CONTIGUOUS GENE DELETION IN AN ARAB PATIENT

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Introduction: Abetalipoproteinemia (ABL) is a rare autosomal recessive metabolic disorder, characterized by the absence of plasma apolipoprotein B- containing lipoproteins and very low levels of plasma triglycerides and cholesterol. ABL is caused by mutations of the MTP gene. We investigated the genetic basis for ABL in a cohort of Israeli families.
Patients / Methods: ABL is caused by mutations of the MTP gene. To identify ABL-causing mutations in the Israeli population we determined the sequence of each of the 18 exons of MTP in nine Israeli ABL patients.
Results: MTP mutations were found in all patients. Five of the nine patients were Ashkenazi Jewish. In three of them we identified a conserved haplotype and a common MTP mutation, p.G865X. The carrier frequency of this founder mutation in the Ashkenazi Jewish population is 0.76%. A Muslim Arab patient was found to be homozygous for a contiguous gene deletion of approximately 481Kb. This deletion includes MTP and eight other genes.
Conclusions: The identification of p.G865X as a founder mutation underlying the majority of ABL cases in Ashkenazi Jews should facilitate molecular diagnosis, carrier screening and genetic counseling in this population. We also report the first case of ABL and additional abnormalities due to a contiguous gene deletion at the 4q23 chromosomal region.

GENETIC AND CLINICAL ANALYSES OF A LARGE FAMILY WITH X-LINKED CONE-ROD DEGENERATION

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Introduction: Only one X-linked gene, RPGR, is currently known to cause cone / cone-rod degeneration (CD/CRD) and two additional loci (COD2 and COD4) were mapped by linkage analysis. One family with progressive cone dystrophy was previously reported to be linked to the COD2 region on Xq27 which is likely to harbor the yet unknown causative gene. The aim of the current study was to perform a genetic and clinical evaluation of a large Moroccan Jewish family with X-linked cone-rod degeneration (XLCRD).
Patients / Methods: Clinical evaluation included detailed family history, full ophthalmologic exam, and full-field electroretinography (ERG). Haplotype and linkage analyses were performed by studying 26 microsatellite markers covering the entire X-chromosome. Mutation analysis was performed by direct sequencing of PCR products. The GO, EST, and SAGEmap databases were used to collect information regarding the function and expression pattern of genes located within the linked interval.
Results: We recruited a large Moroccan Jewish family with XLCRD and clinically assessed six affected children. Affected individuals had varying degrees of nystagmus, their visual acuity was markedly impaired, and all had severely reduced or extinct full field ERG cone responses. Rods were also affected but to a lesser extent. Linkage analysis clearly implicated the COD2 region and excluded the remaining X-chromosome including the RPGR and COD4 regions. Aiming to identify the causative gene, we tabulated all known genes in the COD2 region and collected information regarding their expression pattern and presumed protein function. Out of the 33 genes evaluated, we considered three that are highly expressed in the retina as candidates for the disease. Two of the genes belong to a family of proteins that are speculated to be involved in axonal growth and the third gene encodes a protein with unknown function. A mutation analysis of these genes did not yet revealed the pathogenic mutation..
Conclusions: The family presented here is the second family linked to the COD2 region and may allow identification of the causative gene.

HYPERMETHYLATION OF CPG ISLAND LOCI OF MULTIPLE TUMOR SUPPRESSOR GENES IN RETINOBLASTOMA

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Introduction: Retinoblastoma, a rare pediatric eye tumor, is the most common primary intraocular cancer in children. The retinoblastoma protein, Rb, functions as a tumor suppressor by controlling cell cycle progression through complex interaction of multiple kinases and their inhibitors that together form the Rb pathway. The pathogenesis of retinoblastoma is known to involve inactivation of both copies of the RB1 gene and other genetic or epigenetic alterations in independent molecular pathways. Epigenetic silencing of tumor suppression genes (TSG) by methylation of discrete regions of the CpG Island is a major mechanism for tumorigenesis. To further explore the role of epigenetic genes inactivation in RB, we investigated the methylation phenotype commonly inactivated in other human cancer. Methylation of at least 3 of 5 specific genes may represent a distinct trait referred to CpG island methylator phenotype (CIMP). Positive CIMP tumors are associated with positive BRAF mutations. In this study, we will investigate oncogenic BRAF mutations, the role of epigenetic silencing of multiple TSG in retinoblastoma, and the methylation phenotype.
Patients / Methods: The promoter methylation status of the genes RAS-associated domain family 1A (RASSF1A), death associated protein kinase (DAPK), retinoic acid receptor beta (RAR-beta2) and O6-methyl-guanine-DNA methyltransferase (MGMT), which are important in cell growth regulation, apoptosis, and DNA repair, was determined in DNA extracted from RB tumor samples of 19 patients using methylation-specific polymerase chain reaction. CIMP status was determined for other genes: SOCS-1, IGF-2, RUNX3, NEUROG1 and CACNA1G. BRAF mutations in RB samples were analyzed using PCR and direct sequencing.
Results: No BRAF mutations were found. The frequency of cancer-related gene methylation was: RASSF1A 89%, NEUROG1 50%, DAP-kinase 5%, RUNX3 5%, CACNA1G 5% , and none in MGMT , RAR-β2, SOCS-1 and IGF-2.
Conclusions: High rate of hypermethylated RASSF1A in RB has been previously reported. The absence of MGMT hypermethylation might be associated with low tumor stage. We found negative CIMP in RB, as well as lack of BRAF mutations. The frequent methylation status found in NEUROG1 may provide an alternative pathway in the development and progression of RB, but further study is needed.

BONE MARROW DERIVED STEM CELLS DIFFERENTIATION IN ISCHEMIC RETINA

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Introduction: To enhance neuronal differentiation of adult bone marrow-derived stem cell (BMSCs) in the retina, following induction of ischemic optic neuropathy.
Patients / Methods: C57Bl6 mice underwent syngeneic transplantation of whole bone marrow cells (wBMC) from GFP donors to generate full chimeras. After three months, the mice bone marrow was mobilized with GM-CSF (5 daily doses of 15 μg/g) and one of the eyes was injured. Ischemic optic neuropathy (AION) was induced by laser photosensitization of intravenously-injected Rose Bengal over the optic disc. The contralateral eyes served as negative controls. The next day the mice were injected (intravitreously) with 5 μg of brain derived neurotrophic factor (BDNF). After 4 weeks the eyes were enucleated and analyzed by immunohistochemistry for expression of differentiation markers in the GFP-positive bone marrow cells.
Results: in BDNF-treated eyes, the GFP labeled BMSC homed to and incorporated in the ischemic retina, in particular in the retinal ganglion (RGC) and inner plexiform layers. The GFP-labeled cells in the RGC layer were positive for neuronal markers. Glial, endothelial and myeloid differentiation were observed in other layers of the retina.
Conclusions: In previous studies we showed that bone marrow-derived stem and progenitor cells homed to the injured layers retina efficiently and selectively. In this study, the response of these cells to local injury signals was promoted by exogenous administration of BDNF. We found a marked increase in number of cells expressing neuronal markers in the RGC layer, development of dendritic extensions to the adjacent cells within 4 weeks after the insult. These data serve the basis for further assessment of the functional involvement of bone marrow-derived cells to retinal injury.

MOLECULAR CHANGES IN THE MOUSE RETINA FOLLOWING INDUCTION OF CENTRAL RETINAL ARTERY OCCLUSION

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Introduction: Central retinal artery occlusion (CRAO) is an ophthalmologic emergency that causes a major irreversible visual loss. Our purpose was to characterize the molecular changes in the retina following induction of CRAO in a mouse model.
Patients / Methods: CRAO was induced in 100 adult male mice by laser activation of intravenous injected rose Bengal at the origin of the central artery emerging from the optic nerve head. The right eye was treated, and the left served as a control. The animals were divided into 3 groups: 60 were examined for molecular changes, 30 for histologic changes, and 10 for vascular changes. Clinical fundus examination was performed 1, 3, 6, 12 and 24 hours following CRAO induction, and again on days 7 and 21. Fluorescein angiography was performed 3, 6, and 24 hours after CRAO induction. The animals were euthanized and the eyes prepared for histology and apoptosis assay. RNA, extracted from the retina on different time intervals, was analyzed for levels of hypoxia- induced factor 1alpha, vascular endothelial growth factor, Thy-1 and heme oxygenase 1 using real time-polymerase chain reaction on cDNA.
Results: Up to 24 hours following CRAO induction, the retina was edematous with interrupted blood perfusion in all groups. Fluorescein angiography revealed reduced arterial perfusion at 3 hours after CRAO induction, and onset of reperfusion at 6 hours after induction. On histologic sections, nuclear loss was maximal on day 21 in all groups tested. Thy-1 expression decreased to 65% of baseline levels on day 7. Gene expression of HIF1α and HO1 decreased to 0.75 at 3 hours and returned to normal levels after 7 days, while no changes from baseline levels were detected for VEGF. Maximal expression was detected for HO1, VEGF, Thy-1 and HIF1α by 6, 1.5, 1.4 and 1.2 folds, respectively, 12 hours after induction.
Conclusions: CRAO causes specific histologic and molecular changes in the retina. Most prominant elevation was measured for HO1 within 12 hours. Measurement of apoptosis and changes in gene expression in this setting may improve understanding of the underlying pathophysiology and the analysis of the neuroprotective effect of various treatments in the future.

A COMPARISON OF THE ELECTRICAL IMPEDANCE PROPERTIES OF PRESERVED AND FRESH PORCINE OCULAR TISSUES

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Introduction: The goal of this study was to compare the passive electrical properties of fresh and preserved porcine ocular tissue and to associate the findings with possible changes in tissue properties. Furthermore, In vitro studies on ophthalmic tissue are often done after various periods of preservation and measuring the changes in electrical properties could provide valuable data.
Patients / Methods: Impedances of porcine cornea, lens, sclera and uveal tissue were measured in vitro for two situations: eyes preserved for 72 hours after enucleation at 4˚c and eyes measured within one hour from enucleation. Measurements were done at room temperature. We employed a custom developed system able to measure four-electrode impedance from 1kHz to 400 kHz (injected current < 100 µA).
Results: The results of the complex impedance are presented in a Cole-Cole model. Average resistivity of lens at 1kHz was 400 Ω.cm and that of sclera was 100 Ω.cm. Significant resistivities differences were found for the between the preserved (70Ω.cm) and the fresh cornea (900 Ω.cm).Furthermore, lens (fresh and preserved) as well as fresh cornea resistivities demonstrated marked relaxation process. This, however, was not found in the preserved cornea or other ocular tissues.
Conclusions: Changes in impedance properties of corneal tissue before and after refrigeration are probably related to alteration in corneal hydration status. The disappearance of the relaxation phenomena might suggest changes in water-extra cellular matrix interaction.

AXONAL DAMAGE AND DEMYLINATION IN THE OPTIC NERVE FOLLOWING CRUSH INJURY OF TRANSGENIC MICE

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Introduction: Optic nerve crush is a graded, reproducible injury to the axons of the optic nerve that can be used to explore changes in retinal ganglion cells (RGCs) and optic nerve. Thy1 is a surface glycoprotein uniquely expressed in RGCs and their axons; 2', 3'-cyclic nucleotide 3'-phosphodiesterase (CNPase) is an enzyme found almost exclusively in oligodendrocytes, which form myelin in the central nervous system. The aim of the study was to improve our understanding of the pathophysiology of axonal injury , and its influence on the RGCs and oligodendrocytes , using transgenic mice labeled for Thy1-Cyan Fluorescent Protein (CFP) or CNPase-Green Fluorescent Protein (GFP).
Patients / Methods: Both groups of transgenic mice were anesthetized, and the right optic nerve was crushed. The crush procedure was performed three times for 7 seconds each using forceps, at 2.5- 3.0 mm posterior to the globe. The eyes were enucleated in temporal manner and the brain with the optic nerves was completely dissected. Cryopreserved sections of both optic nerves measuring 6.0 microns were analyzed with fluorescence microscopy. Flat-mounted retinas of the Thy1-CFP mice were also analyzed for RGC loss..
Results: Optic nerve injury could be detected from day 4, reaching a maximum after two week. Axonal loss and demyelination occurred simultaneously. The damage proceeded retrogradely and could be seen peri-chiasmaticallywithin 4 days. An 70% RGC loss was detected after 2 weeks.
Conclusions: The simultaneous axonal injury and loss of myelinization in the present study suggests compound injury of RGCs and oligodendrocytes. The significant loss of ganglion cells indicates the severity of the damage. Transgenic mice offer a promising method of investigating exploring optic nerve damage following crush injury. Fluorescence labeling of the axons and myelin can shed light on the mechanisms of injury and the pathophysiology of optic neuropathies. The use of this model may be extended to study the neuroprotective effect of various agents.

CHEMOKINE RECEPTOR-2 KNOCKOUT MOUSE (CCR2-/-) AS AN ANIMAL MODEL FOR AGE RELATED MACULAR DEGENERATION (AMD)

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Introduction: Recent studies have suggested using the chemokine receptor-2 knockout mouse (Ccr2-/-) as an animal model for Age Related Macular Degeneration (AMD). We aim to further characterize retinal alterations of this mouse strain in order to assess its potential similarities with AMD.
Patients / Methods: Retinal morphology and function were studied in aged Ccr2-/- mice and in age and genetic background-matched (C57BL/6) control mice (16-23 months old). Color fundus photographs and autofluorescence (AF) images were analyzed for assessment of drusen development and AF patterns in Ccr2-/- mice, respectively. Retinal function was evaluated by full field light and dark adapted electroretinography (ERG).
Results: Subretinal deposits which closely resemble drusen were observed by ophthalmoscopy in aged mice. The number of such deposits as assessed by a masked observer was significantly higher in Ccr2-/- mice compared with controls (21.8 ± 6.3 vs. 4.1 ± 4.5, respectively, $p= 0.0004$, t-test). Levels of AF were significantly higher in Ccr2-/- mice compared with controls (52.1 ± 24.4 in arbitrary units vs. 26.1 ± 12 respectively, $p=0.02$, t-test). Mean scotopic and photopic ERG responses were similar in Ccr2-/- mice and controls.
Conclusions: These data suggest that retinal alterations in aged Ccr2-/- mice share similarities with AMD in humans. The presence of drusen-like deposits and increased AF suggest altered retinal pigment epithelium. Our ongoing studies of this mouse strain using molecular biology approaches may provide insights into the pathogenesis of the retinal degeneration in Ccr2-/- mice and of AMD in humans.

RETINAL DEGENERATIONS CAUSED BY NR2E3 MUTATIONS IN THE ISRAELI AND PALESTINIAN POPULATIONS

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Introduction: The NR2E3 gene encodes a nuclear receptor transcription factor that is involved in photoreceptor differentiation. Different NR2E3 mutations were shown to be the cause of different clinical diagnoses such as enhanced S-cone syndrome (ESCS), Goldmann-Favre syndrome, and clumped pigmentary retinal degeneration. Our purpose was to evaluate the involvement of NR2E3 in retinal degenerative disease in the Israeli and Palestinian populations.
Patients / Methods: Israeli and Palestinian patients from 35 families with various autosomal recessive retinal degenerative diseases were recruited for the study. Clinical evaluation included a full ophthalmologic exam, assessment of refractive error, color vision testing, and full-field electroretinography (ERG). Haplotype analysis was performed by studying single nucleotide polymorphisms (SNPs) within the NR2E3 gene. A screen for sequence changes was performed by restriction enzyme analysis and sequencing of PCR products.
Results: We recruited seven Muslim families with probable ESCS. Patients from these families manifest decreased visual acuity early in life, characteristic ERG findings including severe impairment of the rod response with atypical supranormal cone responses under both photopic and scotopic conditions, and some patients had clumped pigment in their peripheral retina. In three of these families, we identified a single homozygous NR2E3 mutation, IVS1-2A>C, as the cause of disease. To study the possible role of NR2E3 in the etiology of retinitis pigmentosa (RP), we performed a homozygosity analysis in 28 families with a clinical diagnosis of autosomal recessive retinitis pigmentosa. The analysis revealed a homozygote mutation, Arg311Gln, in one Muslim and one Jewish family. Interestingly, the ERG responses in these families were compatible with RP and did not show the characteristic ESCS pattern.
Conclusions: Our results demonstrate the involvement of NR2E3 in both ESCS and autosomal recessive RP in our population.

REGISTERED BLINDNESS AMONG ADULTS IN ISRAEL: 1996-2005

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Introduction: Our purpose was to estimate the population–based incidence rates of blindness registration and their trends over time in the Israeli adult population.
Patients / Methods: We performed a retrospective review of the data on bilateral blindness in adults ≥ 40 years of age registered with the Association of the Blind of Israel between 1996-2005. The causes of blindness were ascertained and the incidence rates of blindness due to various causes were calculated.
Results: A total of 18,666 blind certificates were examined. The most commonly recorded cause of blindness was age-related macular degeneration (AMD), followed by glaucoma and diabetic retinopathy. From 1996 to 2005, the annual incidence of registered bilateral blindness decreased significantly at an average rate of 4.8% per year ($P<0.0001$). Glaucoma blindness significantly decreased at an average rate of 8.1% per year ($p>0.0001$), but there were no similar changes in the incidence of AMD blindness (1% rise per year, $p =0.17$) or diabetic retinopathy blindness (1% decrease per year, $p=0.62$).
Conclusions: Advances in treatment management of ocular pathology have led to a significant decrease in the number of adults with glaucoma-associated bilateral blindness in Israel from 1996 to 2005.

RDH5 MUTATION ANALYSIS IN A SERIES OF ISRAELI PATIENTS WITH FUNDUS ALBIPUNCTATUS: DETECTION OF NOVEL MUTATIONS

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Introduction: Fundus albipunctatus is a rare autosomal recessive congenital stationary night blindness with severely delayed dark adaptation caused by mutations in the11-cis retinol dehydrogenase [RDH5] gene. In a subpopulation of patients, cone and macular function may also be affected. Our purpose was to clinically and genetically characterize Israeli patients with Fundus Albipunctatus
Patients / Methods: Six patients with Fundus albipunctatus from four distinct ethnicities underwent a full clinical ophthalmic exam and full field electroretinography (ERG) according to the ISCEV protocol, including repeat testing after 3 hours of dark adaptation. Genomic DNA was extracted from peripheral blood and mutation analysis of the RDH5 gene was performed by direct sequencing of PCR-amplified exons.
Results: Israeli Fundus albipunctatus patients manifested the characteristic widespread sub-retinal white spots on funduscopy, and on ERG testing showed an initially severely impaired scotopic response which markedly improved following prolonged dark adaptation. One patient, of Arab-Muslim descent, also had impairment of cone function. All patients were affected by RDH5 mutations. Two of the identified mutations are novel and result in truncation of the 11-cis retinol dehydrogenase protein: the R54X mutation was identified in Jews from Persia and Buchara, and a four nucleotide deletion (70 del TGCC) that predicts a frameshift in codon 24 and a premature termination of translation was identified in Ashkenazi Jews. A missense mutation previously reported in one patient (D128N) was identified in the Arab-Muslim patient.
Conclusions: Mutation analysis of the RDH5 gene in Israeli Fundus albipunctatus patients revealed two novel and one previously reported mutation. This underscores the important role played by this gene in congenital stationary night blindness.

DESENSITIZATION OF TRPV1 IN PAIN TRANSDUCTION

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Introduction: Acute ocular pain is associated with many causes such as injury and optic neuritis. The control of severe pain with currently available analgesics is frequently less than optimal. TRPV1 is a member of the Transient Receptor Potential (TRP) family of channel proteins. TRPV1 has been observed in the cornea and the spinal trigeminal nucleus, where peripheral and central processes of the trigeminal neurons terminate. TRPV1 is a polymodal ion channel that integrates several types of noxious stimuli: heat, extracellular acidification, and capsaicin, a pungent extract from hot chili peppers. The convergence of these stimuli on TRPV1 channels expressed in peripheral sensory nerves underlies the common perceptual experience of pain due to hot temperatures, tissue damage and exposure to capsaicin. Desensitization of TRPV1 enables nociceptors to adapt to painful stimuli by diminishing their overall response to a sustained signal. Understanding the molecular basis of this phenomenon may enable us to design new therapies for treating acute ocular pain. Extracellular Ca2+ is required for desensitization to occur, although, until recently, the mechanism by which Ca2+ mediates desensitization was unknown.
Patients / Methods: We used classic electrophysiology methods to study TRPV1. Mammalian cells in tissue culture were transfected with TRPV1. Current was measured by voltage clamp in either whole cell or excised patches. Calmodulin (CaM) and membrane lipids were applied to either the external or internal side of the patches. FRET was carried out on xenopus oocytes expressing various fluorescently labeled proteins.
Results: Single channel analyses demonstrate that CaM affects channel gating. Electrophysiological studies indicate that both Ca2+/CaM and a mutant CaM trapped in the Ca2+-free state (CaM1,2,3,4) interact with TRPV1. We have identified a putative CaM binding domain in the N-terminal region of TRPV1, and preliminary observations of fluorescent resonance energy transfer (FRET) between CFP-CaM and YFP-TRPV1 further indicate that CaM interacts with the N-terminal region of the channels.
Conclusions: We have shown that the ubiquitous Ca2+ sensor calmodulin (CaM) inhibits activation of TRPV1 by capsaicin, and that this inhibition is a molecular candidate for the behavioral desensitization described.

ROLES OF PAX6 IN RETINAL PIGMENTED EPITHELIUM (RPE) DEVELOPMENT

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Introduction: The Retinal Pigmented Epithelium (RPE) is a one layer tissue of cuboid epithelial cells, that lies between the retina and the choroid. It serves as a major component of the blood-retina barrier and is involved in nutrients flow from the choroid to the retina. Additional roles of the RPE are to provide mechanical protection for the outer segments of the photoreceptors and absorbance of excess light. The Pax6 gene is known to be a "master regulator" of eye development. Pax6 is expressed in the developing pigmented epithelium (PE) which will give rise to the RPE, iris and cilliary body. Despite its importance in eye development, little is known about its role in RPE. The purpose of this study is to understand the role of Pax6 in RPE development and the mechanism which mediates its function.
Patients / Methods: We employed the Cre/loxP system to induce conditional inactivation of the Pax6 gene in the developing RPE. In order to reveal the effect of conditional elimination of Pax6 from the RPE, we used histological (H&E) staining, immunofluorescence and In Situ RNA.
Results: Pax6 inactivation in the RPE occurs at E10.5. This inactivation leads to micropthalmia, RPE abnormalities and complete loss of cilliary body and iris. In the molecular level we noticed changes in the expression pattern of Gas1 (growth arrest-specific1) indicating early disruption of cilliary body and iris progenitor cells. In addition we noticed a change in the molecular phenotype of the developing RPE which indicates a change in the specification and differentiation of the RPE.
Conclusions: In this work we demonstrate the importance of Pax6 in RPE development and its crucial role in the early development of the pigmented epithelia of the cilliary body and iris.

THE ROLES OF PAX6 IN DEVELOPMEND OF THE OCULAR LENS

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Introduction: The Pax6 transcription factor is essential for the development of the eye as well as the CNS, pancreas and olfactory system. With complete loss of Pax6, eyes fail to develop, while when only one copy of the gene is disrupted, severe ocular abnormalities are observed. In the mouse these abnormalities include microphthalmia, aniridia and cataracts. The proper development of the ocular lens depends on Pax6 activity and normal dosage of expression. Pax6 is detected in the Lens Epithelium cells throughout development. Previously, using the Cre/loxP approach we have demonstrated that Pax6 is required within the surface ectoderm for the formation of the lens placode. In the current study we further explore the role of Pax6 at subsequent stages of lens development, after the lens vesicle has formed.
Patients / Methods: The Cre/loxP conditional knock-out approach was employed to delete the Pax6 specifically from the lens subsequent to the lens vesicle stage. Specific Cre expression in the lens was achieved by employing the Mrl10-Cre transgenic mice, in which a Pax6 consensus binding site and the alphaA-crystallin promoter are used to regulate Cre expression.
Results: A Dramatic change in lens size and morphology was observed in the Pax6flox/flox;Mrl10-Cre mice. These changes in the lens were further characterized in respect to morphological, cellular and molecular changes. Pax6 was ablated from the Pax6flox/flox;Mrl10-Cre embryos during mid-gestation. The loss of Pax6 resulted in a number of abnormalities that differed according to the differentiation stage of the mutated lens-cell. Lens epithelial cells that are devoid of Pax6 fail to exit cell-cycle and to differentiate into fiber cells. In addition, Pax6 promotes survival of lens epithelial cells, as mutant animals showed increased levels of apoptosis and a severe decrease in lens size.
Conclusions: Our findings expose novel roles for Pax6 in regulation of cell cycle exit, for the survival of lens epithelium and for proper differentiation of the lens fibers.

ELUCIDATING THE TRANSCRIPTIONAL TARGETS OF PAX6 IN MAMMALIAN RETINOGENESIS

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Introduction: The Pax6 transcription factor is essential for normal development of the brain, pancreas and the eye. We investigate the functions of Pax6 in eye development, as Pax6 is essential and sufficient for eye formation in different organisms and has the capacity to induce the formation of ectopic eyes in flies and frogs upon misexpression. Inactivation of Pax6 leads to early arrest in eye development, thus prohibiting the analysis of the gene's role in later stages of development and adulthood. Therefore, a conditional mutagenesis approach (Cre/loxP) was employed. Only a small number of Pax6 direct targets are known. We aim to discover novel direct targets of Pax6 in retinal progenitor cells prior to the onset of their differentiation. This will lead to unravelling of other players in eye developmental cascade that play role in cell fate acquisition in retinogenesis.
Patients / Methods: a-Cre line was used to inactivate Pax6 in the distal OC of Pax6flox/Pax6flox; a-Cre embryos. Pax6-deficient as well as control RPCs were isolated from E12 embryos by employing fluorescence-activating cell sorter. The RNA isolated from these cells was subjected to comparison of gene-expression profiles using the Affymetrix Gene Chip microarray. The 5kb upstream regions of annotated genes that were differentially regulated in the microarray experiment were scanned In-Silico for the presence of Pax6 binding sites. Comparative genomics was employed in order to filter out false positives. Chromatin ImmunoPrecipitation was used to verify the predictions.
Results: Following the microarray experiment, 964 genes have shown statistically significant difference in expression between wild-type and the Pax6(flox/ flox;a-Cre) retinas; 318 were downregulated and 646 upregulated. A total of 1151 putative Pax6 binding sites and 265 evolutionary conserved regions were found in the upstream region of these genes. The intersection yields 99 genes with conserved putative Pax6 binding sites in their upstream regions. 6 genes were tested using ChIP and 4 of them were found to bind Pax6.
Conclusions: We have devised an approach to discover novell Pax6 direct targets in vivo. This will help us in the future to unravel other players in eye developmental cascade, identify direct targets in other tissues and identify transcriptional co-regulators.

HISTOLOGICAL AND CROSS-SPECIES MICROARRAY ANALYSIS OF THE PERIPHERAL RETINA VERSUS THE RED AREA IN THE PIGEON

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Introduction: The molecular events leading to the development of different retinal regions, and mainly the macula, are poorly understood. The main reason is the lack of an appropriate animal model. We have chosen the pigeon retina, which includes both a central fovea and a large nasal macular-like region (the red area), as a model for identifying genes involved in regional development of the retina.
Patients / Methods: Different retinal regions were dissected from adult pigeon retinas. For histological analysis, retinal samples were fixed in Davidson solution, and embbeded in parafin. For gene expression analysis, total RNA was extracted and used for screening the affymetrix whole-genome chicken microarray. Data analysis included normalization and electronic filters.
Results: Histological analysis of different areas of the adult pigeon retina revealed a higher concentration of ganglion cells in the red area versus the peripheral retina. Since there is no available whole-genome microarray for the pigeon genome, we performed a novel aproach, cross-species microarray hybridization, using pigeon retinal RNA and chicken microarray. To validate the reliability of the hybridization signal, we aligned the nine genes for which the sequence is known for both species, and calculated the regression between intensity levels and sequence mismatches. The results revealed a high correlation of 0.91, indicating that this novel approach might be useful for estimating relative gene expression levels in the pigeon retina. A statistical analysis of the data obtained from the two microarray slides revealed 2200 genes with 2-fold expression difference. In line with the histological data, among the genes preferably expressed in the red area were many genes which are specific to ganglion cells, such as SNAP25 and Stathmin. On the other hand, genes that are known to be expressed in cone photoreceptors are enriched in the RNA sample extracted from the res area. Among the differentially expressed genes, a high number encodes transcription factors that are considered as canidates for involvement in regional retinal development.
Conclusions: Our results suggest that cross-species microarray hybridization in avians is a usful tool for gene expression analysis. We provide here the first attempt to identify genes with differential regional expression in the avian retina.

EVALUATION OF OCULAR SURFACE CHANGES IN SULFUR MUSTARD INJURIES IN RABBITS, USING IMPRESSION CYTOLOGY

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Introduction: Ocular injuries induced by sulfur mustard (SM) are characterized by acute corneal erosions, anterior segment inflammation and delayed keratopathy, leading to irreversible visual deficits. Partial Limbal Deficiency was shown previously by us, using clinical and histological evaluations. The present study aimed at monitoring ocular surface changes following SM exposure, utilizing impression cytology in rabbits. The relation to clinical symptoms was tested.
Methods: All experiments were performed according to ARVO resolution on the Use of Animals in Research. Rabbit eyes (N=10) were exposed to SM vapor. A clinical follow-up was carried out for tow months, based on slit-lamp examination and pachymetry. Impression cytology (IC) samples were obtained from the upper bulbar conjunctiva, limbus and central cornea on filter paper under general anesthesia. The samples were stained by PAS and analyzed for goblet cell (GC) density, N/C ratio and general morphology of cells in the various ocular surface regions. Testing was conducted daily during the first week and once a week thereafter.
Results: SM induced acute corneal erosions and prolonged anterior segment inflammation. Following an apparent clinical healing, most of the eyes developed a delayed corneal injury characterized by neovascularization, edema and epithelial defects. IC, during the acute phase (1 week), showed damaged cells in cornea and conjunctiva including disappearance of GC. 1-2 weeks after exposure when corneas looked clinically normal, pathological features such as GC, peeled off epithelium and giant cells were observed using the IC. GC density in the conjunctiva was significantly low and did not return to baseline values even after 2 months.
Conclusions: IC was found useful for an early diagnosis of abnormal changes of ocular surface following SM exposure, which may be related to the delayed pathology. The procedure enables to monitor long-term changes in the same eyes and to elucidate the role of potential treatments.

INVOLVEMENT OF MMPS IN OCULAR RESPONSE TO SULFUR MUSTARD IN RABBITS

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Introduction: The gelatinases, MMP-2 and MMP-9, are involved in physiological and pathological processes that include extracellular matrix remodeling. Sulfur mustard (SM) causes acute ocular lesions that in some cases develop into delayed pathology. Thus, gelatinase activity was measured in cornea and in tears following ocular exposure to SM, and the clinical status of the eyes was evaluated.
Methods: Rabbit eyes were exposed to SM vapor. Clinical evaluation, using slit-lamp and pachymetry, was performed daily for the first week and once a week thereafter, for up to 1 month. Gelatinase activity was measured by zymography at various time points post exposure.
Results: Acute corneal lesions, observed during the first three days after exposure, declined spontaneously within one week. Corneal MMP-9 activity, which is absent in naïve rabbits, was detected at 24h post exposure. The activity peaked at 48h-72h, corresponding with the severity of the clinical signs, and was still observed at 1 week. Delayed lesions, characterized mainly by neovascularization, were seen in 50% of the eyes at 2 weeks, and corneal MMP-9 activity was found only in these impaired eyes. Constitutive corneal MMP-2 activity was present in naïve rabbits. The activity increased beginning at 72h, and remained high for 2 weeks regardless of clinical status. In tear fluid of naïve rabbits, gelatinase activity was negligible. Following SM exposure, while MMP-2 activity remained insignificant, MMP-9 activity was elevated beginning at 24h post exposure and remained high throughout the follow up period. In some cases of non-impaired eyes this activity declined at 3 weeks.
Conclusions: MMP-9 activity, which is absent in naïve corneas and tears, was correlated to the ocular clinical status following SM vapor, indicating a possible role of MMP-9 in acute wound healing and development of delayed pathology. Prolonged elevated corneal MMP-2 activity was observed as well. These results may have diagnostic and therapeutic implication in SM injury.

PAPERS

Cornea

"PATHOGNOMONIC" PATTERN OF CORNEAL EROSION AND OTHER OCULAR INJURIES CAUSE BY AIRSOFT GUNS.

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Introduction: Airsoft guns are plastic pistols that shoot hard round plastic bullets approximately 6mm in diameter. These guns are gaining popularity since they are relatively inexpensive and can be purchased with no age restriction. There is an increasing rate of ocular injuries caused by these guns. The purpose of this study was to explore the characteristic ocular findings caused by Airsoft guns.
Patients / Methods: All cases of ocular injuries from Airsoft gun bullets in the years 2005–2006 were included. Complete ocular examination was performed in each case and most of the cases were photographed. Ballistic investigation of the Airsoft gun bullets was performed using ultra high-speed still and video cameras. Airsoft impact tests were also performed on rabbit eyes and histopathological examinations were performed.
Results: Sixteen patients were included in this study. The mean age was 10.2 years, 93.8% were males. The most common injuries were corneal erosion and traumatic hyphema (68.8% and 50.0%, respectively). A unique "ring" pattern was seen in 54.5% of corneal erosions. No penetrating injuries were seen. One patient had commotio retinae and one patient suffered transient IOP elevation. All patients had final VA of 20/30 or better. Mean period until resolution was 6.7 days.
Conclusions: This is the largest reported series in the literature of ocular injuries from Airsoft guns. Our findings demonstrate a "pathognomonic" pattern of corneal erosion which was not previously described. It is advised that the use of this dangerous toy should be restricted and done only with protective goggles.

STUDYING THE EFFECT OF CORNEAL TISSUE PROPERTIES AND IOP ON NORMAL AND KERATOCONIC CORNEAS USING FINITE ELEMENTS BIOMECHANICAL MODEL

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Introduction: The pathogenesis of KC is not known but is probably related to changes in intrinsic biomechanical properties of the cornea, corneal thinning or a combination of these processes. Post LASIK corneal ectasia might share some pathogenetic processes of KC and is characterized by progressive steepening of the cornea and visual loss.
Patients / Methods: Three-dimensional finite element (FE) simulations was developed in order to asses the effect of several factors on corneal shape and intrastromal stress distribution. Corneal topography was created by calculating best sphere curve fitting and calculating the optical power of the corneal anterior surface. Normal corneas were compared with several combinations of morphological changes (thinning) or decreased tissue mechanical properties. The effect of several values of intraocular pressure (IOP) on corneal curvature, cone elevation as well as on tissue stress was further evaluated.
Results: Four major factors influenced the shape of the cornea: the meridian elastic modulus of the cornea, the shear modulus perpendicularly to the corneal surface, corneal thickness and IOP. Decreasing the meridian modulus and shear modulus of the cornea (mimicking degradation of the normal collagen fibril structures), resulted in a conical shape of the cornea and increase of corneal steepening and astigmatism. Corneal thinning (generalized or localized) was also associated with further shifting of the corneal apex. Increasing IOP resulted in exacerbation of cone elevation as well as increase in intrastromal mechanical stress. The IOP influence on the cornea's radius of curvature was significantly higher in KC corneas (increasing IOP by 1.0 mmHg caused a decrease of 40.0 μm in the radius of curvature) as compared to normal (5.0 μm). Moreover, it was shown that as more as advanced the keratoconus condition is, the higher decrease in radius of curvature per 1.0 mmHg increase is produced.
Conclusions: The present FE studies allowed characterization of the effects and interactions of several biomechanical corneal tissue properties and IOP in normal as well as pathological corneas. IOP has a large effect on corneal curvature and intrastromal corneal stress distribution. This model can serve for prediction the effect of IOP lowering in KC or post LASIK ectatic corneas.

THE POTENTIAL USE OF AMNIOTIC MEMBRANE TRANSPLANTATION FOR TREATMENT OF PARTIAL LIMBAL STEM CELL DEFICIENCY FOLLOWING SULFUR MUSTARD EXPOSURE IN RABBITS

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Introduction: Ocular injuries induced by sulfur mustard (SM) are characterized by acute corneal erosions, anterior segment inflammation and delayed keratopathy, leading to irreversible visual deficits. The late pathology is characterized by chronic inflammation, epithelial defects, impairment in corneal innervation and neovascularization, typical characteristics of Partial Limbal Stem Cell Deficiency (PLSCD). The aim of the present study was to further elucidate the pathological mechanism of SM- induced delayed keratopathy and to test the potential use of amniotic membrane transplantation (AMT) for treatment.
Patients / Methods: Animal Care and Use Committee approval at IIBR was obtained. Rabbit eyes were exposed to SM vapor. Slit-lamp examination and pachymetry were carried out and at the end of experiments corneas were processed for histology. AMT was conducted in corneas displaying delayed pathology while clinically impaired untreated corneas served as controls. A single layer of human AM was placed over the cornea following superficial keratectomy and adhered by soft contact lens (silicone hydrogel, PureVision TM, Bausch &Lomb) and tarsorrhaphy for 1 week. Topical antibiotic was applied for 3 days.
Results: Focal limbal damage was observed in corneas displaying the typical delayed injuries, expressed by stromal cellular infiltration, invasion of inflammatory cells into limbal epithelium and migration of goblet cells towards the cornea. AMT improved corneal epithelialization (migration and adherence), reduced inflammation and vascularization, compared to the severe edema and epithelial defects in the untreated controls. Yet, abnormal corneal epithelial phenotype was still seen.
Conclusions: A continuous cell death was observed in limbal epithelium following SM exposure, associated with focal inflammatory response. It is suggested that stromal inflammation in the limbus conferred impaired microenvironment to corneal epithelial stem cells, thus leading to their loss and to a second cascade of pathological events. AMT reduced the ongoing inflammation and facilitated epithelial healing, however, further studies are required to determine whether AM alone is sufficient for therapy of PLSCD following SM exposure.

OCULAR EFFECT, TOLERABILITY AND SAFETY OF 0.03% TACROLIMUS OINTMENT IN PATIENTS WITH INTRACTABLE ALLERGIC CONJUNCTIVITIS

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Introduction: To determine the efficacy, tolerance and safety of 0.03% tacrolimus ointment, a potent immunosuppressive macrolide antibiotic, in the treatment of intractable allergic conjunctivitis.
Patients / Methods: 20 patients (mean age 10.8 years: range 6-26) with intractable allergic conjunctivitis were treated in an open-label study. Patients received topical 0.03% tacrolimus ointment alone, twice daily for 8 weeks and were followed for 2 weeks after stopping the study drug. Full eye examinations were conducted weekly. Objective symptoms of chemosis, tarsal follicle size, corneal staining and subjective symptoms of tearing, itching and photophobia were recorded (as per modified scoring system of Abelson). We monitored complete blood count and tacrolimus levels.
Results: Marked clinical improvement in the modified Abelson score was observed over the 8 weeks of treatment, in all categories. In addition we noted marked improvement in visual acuity in some of the patients. Adverse events were limited to local burning in one patient that discontinued treatment. No signs of immunosuppression occured. Tacrolimus 0.03% levels were undetectable.
Conclusions: Tacrolimus ointment 0.03% appears to be safe, well tolerated, and effective in the treatment of allergic conjunctivitis refractory to traditional treatments.

LONG TERM CONTROL OF POST-LASIK MYOPIC SHIFT IN HIGH MYOPIA WITH TOPICAL TIMOLOL MALEATE

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Introduction: The purpose of this study was to describe the effects of topical timolol maleate on myopic regression after laser in-situ keratomielusis (LASIK).
Patients / Methods: Timolol 7.9 years)±maleate was used twice daily in 32 eyes of 19 patients (age 29.9 who had myopic regression and decrease of visual acuity (spherical equivalent [SEQ] of -1.00 or more). The treatment began 2-36 months after uneventful LASIK, and followed up for 10-38 months. SEQ, uncorrected visual acuity (UCVA), intraocular pressure (IOP), pre-operative pachymetry, ablation depth and number of laser pulses were recorded. The main outcome measure was the SEQ reduction during treatment with topical timolol.
Results: The pre-operative SEQ was -9.6 +/- 2.9 D (range -5.75 to -14.75) in the right eye and -9.9 +/- 2.6 (range -6.87 to -14.25) in the left eye. After 2-36 months, a residual myopia of -1.87 +/- 0.77 D (range -1 to -2.75 D) was noted in 32 eyes, and topical timolol maleate was started. After 1.78 +/- 1.23 months (range 1-6 months) the SEQ was reduced to -0.94 +/- 0.57 D (range 0 to -1.75 D), $p<0.0001$ (Wilcoxon test). The UCVA improved from 0.34 +/- 0.15 to 0.63 +/- 0.23 ($p<0.0001$, Wilcoxon test). The IOP did not change and remained stable. The reduction in SEQ correlated with the pre-operative SEQ ($r=-0.48$, $p=0.0059$), and with the post-operative SEQ before treatment was started ($r=-0.69$, $p<0.0001$). It marginally correlated with the calculated residual stromal bed ($r=-0.32$, $p=0.072$), and the pre-operative central corneal thickness ($r=-0.29$, $p=0.09$). Patients who continued the timolol use maintained a lower SEQ at the last follow up visit, compared to those who decided to discontinue the treatment (-1.00 +/- 0.43 D vs. -1.59 +/- 0.66 D, respectively; $p=0.025$, Mann-Whitney test). The time between surgery and beginning of timolol treatment did not affect the SEQ reduction.
Conclusions: Long term treatment with topical timolol maleate reversed residual myopia and improved visual acuity after LASIK. The beneficial effect of timolol was maintained as long as the treatment continued.

DOWNREGULATION OF VEGF RECEPTORS (VEGFR-1/FLT-1 AND VEGFR-2/FLK-1) IN THE HUMAN CONJUNCTIVAL EPITHELIUM IN CHRONIC OCULAR SURFACE INFLAMMATORY DISORDERS

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Introduction: VEGF receptors were previously shown to be downregulated following denervation and after inflammatory stimulation in several in-vivo and in-vitro models. The purpose of this study was to evaluate the protein expression of several angiogenic mediators in the conjunctival epithelium of patients with chronic ocular surface inflammatory diseases.
Patients / Methods: Impression cytology specimens were collected from the inferior and the superior bulbar conjunctiva of patients with chronic ocular surface inflammatory diseases, including Sjogren's syndrome, ocular rosacea, conjunctival chalasis and ocular cicatricial pemphygoid, as well as from healthy volunteers. Cells were transferred to glass slides by repeated printing. Expression of Vascular Endothelial Growth Factor (VEGF), VEGF receptor 1 (Flt-1), VEGF receptor 2 (Flk-1) and Pigment Epithelial Derived Factor (PEDF) was evaluated by immunocytochemistry using mouse anti-human monoclonal antibodies for these proteins. Digital image analysis using ImagePro-Plus software (Media Cybernetics, Silver Springs, MD) was performed to quantify the expression of these mediators. A mean intensity stain index (ISI) was calculated from digital images captured from sequential fields of conjunctival epithelial cells in each coverslip. The mean ISI values of the mediators from patients with ocular surface inflammatory disorders were compared to that of controls.
Results: The mean ISI score of VEGFR-1 (Flt-1) in the conjunctival epithelium of patients with chronic inflammation was 32.5 +/- 12.6 compared to 67.9 +/- 21.3 in healthy controls ($p<0.001$). The mean ISI score of VEGFR-2 (Flk-1) was 42.2 +/- 26.7 in patients compared to 57.8 +/- 27.9 in healthy individuals ($p=0.05$). No significant differences were evident in the expression of VEGF between patients and controls, while the expression of PEDF was barely detected.
Conclusions: The protein expression of VEGF-specific membrane receptor (VEGFR-1/Flt-1 and VEGFR-2/Flk-1) in the conjunctival epithelium is downregulated in chronic ocular surface diseases. This can be a result of chronic inflammation, or of reduced innervation of the ocular surface epithelium, which are common to these diseases.

AMD

A NEW HOME-MONITORING-AMD-PERIMETER FOR THE DETECTION OF CNV ONSET

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Introduction: Currently, monitoring of patients at risk for developing CNV is of limited efficacy, and most patients are diagnosed when the CNV lesion is relatively large, subfoveal, and the visual acuity significantly reduced. In order to detect CNV early, a Home Macular Perimeter (HMP), a new home perimeter for AMD monitoring, utilizing a macular visual field test based on the phenomenon of hyperacuity, was developed. The aim of the present study was to evaluate the learning effects of repeated and frequent use on the potential sensitivity level and performance reliability of the HMP in home environment.
Patients / Methods: The HMP is a prototype of standalone portable PC-based perimetry device. 41 eyes (38 patients) with intermediate AMD underwent supervised examination session with the HMP at their home twice a week for 1 month. A tutorial was followed by 8 sessions. A personalized on-line algorithm adjusted the tests according to subject's performance. The acceptance criteria for a successful performance were that the patient managed to reach a hyperacuity sensitivity level of 0.16 degrees offset on horizontally (H) presented signals or 0.19 degrees offset on vertically (V) presented signals, and that the test was performed in a reliable manner.
Results: 88% percent (36/41 eyes) reached the required working level (≤0.16H or ≤0.19V) and performed the test reliably. 5 patients (5 eyes) did not meet the acceptance criteria. Following the tutorial sessions, all patients, including computer-illiterate ones, managed to operate the device. The performance of the patients while doing the tutorial improved from one practice session to the next .The online analysis, assisting the patient to reach their personalized working level, using “staircase method” was found to be efficient and most patients reached the required sensitivity level in 4-6 sessions.
Conclusions: The concept of home automated perimetry for intermediate AMD patients was validated successfully and can be used in the future generations of the device. This new home diagnostic device holds promise for early detection of CNV with better final outcome following newly developed and evolving treatment options.

PHARMACOKINETICS OF BEVACIZUMAB AFTER SINGLE INTRAVITREAL INJECTION IN THE RABBIT

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Introduction: Bevacizumab (Avastin, Genentech) is a humanized monoclonal antibody designed to bind to all forms of VEGF, thereby blocking vessel permeability and angiogenesis in neovascular age-related macular degeneration (AMD). Intravitreal Bevacizumab has been used in the last 2 years as an off label use to treat neovascular AMD, although no pharmacodynamic data about it exists in the eye. The purpose of this study is to determine the pharmacokinetics and serum bioavailability of intravitreal bevacizumab in the rabbit.
Methods: 12 albino rabbits were intravitreally injected to one eye with Bevacizumab1.25mg/0.05ml. One rabbit served as intact control. Vitreous samples were taken 1, 2, 4, 6 weeks after injection, 3 rabbits for each time point. Blood samples were taken 2 and 6 weeks after injection. Bevacizumab concentrations in the plasma and vitreous were determined by enzyme-linked immunosorbent assay (ELISA) using rabbit anti-human IgG for capture and horseraddish peroxidase (HRP) conjugated rabbit anti-human IgG for detecting.
Results: The mean vitreal concentration of bevacizumab decreased by 37%, 62%, 70% and 81% at the 1, 2, 4 and 6 weeks respectively. Mean vitreal concentration in the uninjected eye was 4.93 ng/ml, 4.36ng/ml, 1.06ng/ml and 0.41ng/ml at the 1, 2, 4, 6 weeks respectively. Mean plasma concentration of Bevacizumab was 17.20 pg/ml, and 7.02 pg/ml at the 2 and 6 weeks respectively. Mean vitreal and plasma concentrations of the control rabbit were lower than the sensitivity of the assay.
Conclusions: The mean half life of Bevacizumab in the rabbit eye was 10 days. The high intravitreal concentrations observed after 6 weeks demonstrates a lower than expected turnover of Bevacizumab. The concentration of Bevacizumab in the plasma and uninjected eye indicates systemic circulation.

GENE EXPRESSION PATTERNS IN WHITE BLOOD CELLS FROM PATIENTS WITH NEOVASCULAR AGE RELATED MACULAR DEGENERATION

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Introduction: Inflammation is thought to play a substantial role in the pathogenesis of age related macular degeneration (AMD). We aim to characterize gene expression patterns in white blood cells (WBCs) from patients with neovascular AMD (NVAMD) in order to identify candidate genes and pathways for involvement in the process.
Patients / Methods: RNA was extracted from WBCs of 16 patients with NVAMD and 16 unaffected, age and gender matched controls. Microarray analysis was performed using oligonucleotide arrays containing 36,000 features, and by applying a reference sample design. Two distinct statistical algorithms were utilized to identify altered expression patterns: significance analysis for microarrays (SAM), and linear models for microarray data (LIMMA). Bioinformatics were applied to identify pathways which are associated with NVAMD. Results were validated using real time quantitative RT-PCR (QPCR) on a set of samples which were not tested by the arrays.
Results: SAM analysis identified eight and 168 genes with NVAMD associated expression patterns at False Discovery Rate (FDR) of 0% and 10%, respectively. Four of the eight genes at FDR 0% were also detected by the LIMMA algorithm. The NVAMD associated gene list was enriched with genes involved in inflammation and antigen presentation. QPCR findings corroborated with microarray results for three of four genes which were tested. The mean increased expression levels in NVAMD patients compared with unaffected individuals for these three genes range between 1.8-fold to 5.3-fold.
Conclusions: NVAMD is associated with altered expression level of several genes in WBCs. Such genes in general, and immune response related genes from this group in particular, are candidates for involvement in the pathogenesis of AMD. Ongoing studies assess if such alterations may serve as biomarkers for the disease, and test whether they are primary or secondary to the disease process.

ASSESSMENT OF CORRELATION AMONG SINGLE NUCLEOTIDE POLYMORPHISMS IN CHROMOSOME 10Q26, HTRA1 GENE EXPRESSION LEVELS, AND CLINICAL CHARACTERISTICS OF NEOVASCULAR AGE RELATED MACULAR DEGENERATION

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Introduction: Single nucleotide polymorphisms (SNPs) in chromosome 10q26 including rs10490924 and a variant in the promoter region of the HTRA1 gene (rs11200638) have been recently associated with age related macular degeneration (AMD). Our aim was to confirm the association among these SNPs and AMD in an independent population, to assess if rs11200638 affects HTRA1 mRNA levels, and to determine whether it accounts for heterogeneity in the clinical manifestations of neovascular AMD (NVAMD).
Patients / Methods: DNA was extracted from 208 AMD patients and 100 age-matched controls. Genotyping for rs11200638 and rs10490924 was performed by restriction enzyme analysis and confirmed with sequencing. HTRA1 mRNA levels were measured in WBCs from 31 individuals with different rs11200638 genotypes using quantitative PCR. Genotypes were correlated with clinical characteristics of NVAMD and with outcome following photodynamic therapy (PDT).
Results: Homozygosity (OR = 9.1, 95% CI = 3.4-24.3, P < 0.001) and heterozygosity (OR = 1.8, 95% CI = 1.1-3.2, P = 0.018) for the risk allele of rs10490924 were associated with AMD. Similarly, homozygosity (OR = 9.4, 95% CI = 2.2-40.6, P = 0.003) for the risk allele of rs11200638 (A variant) was associated with AMD while heterozygosity for this allele showed a trend towards association. The WBC mRNA levels of HTRA1 did not show evidence of a statistically significant correlation with the rs11200638 (HTRA1 upstream) SNP (mean expression level = 0.14 ± 0.16 and 0.25 ± 0.28 for the A and G alleles, respectively, P = 0.3). Neither SNPs were associated with characteristics of NVAMD such as choroidal neovascular membrane type or size, visual acuity, or outcome following PDT.
Conclusions: The rs11200638 HTRA1 promoter variant and rs10490924 are associated with AMD in the Israeli population. However, rs11200638 is not associated with mRNA levels of HTRA1 in WBCs. Neither SNPs account for the variable clinical characteristics and response to PDT among NVAMD patients.

ELUCIDATING THE ROLE OF PYRIDINIUM BIS-RETINOID (A2E) IN THE PATHOGENESIS OF AGE RELATED MACULAR DEGENERATION (AMD)

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Introduction: The lipofuscin fluorophore A2E, a pyridinium bis-retinoid, is known to be an initiator of blue-light-induced apoptosis in retinal pigment epithelial cells (RPE). Degradation of A2E leads to the production of reactive oxygen species (ROS), which activate apoptosis and cell damage. The aim of this study is to gain insight into the mechanisms which underlie A2E-mediated damage to the RPE using bioorganic and biochemical studies.
Patients / Methods: A2E and a bromo-derivative of A2E (A2E-Br), with a group carrying specific functionality for Mass-Spectrometry (MS) studies, were synthesized to provide a better tool for following A2E modification under blue light. A2E and its analog, A2E-Br, were loaded into RPE cell line for bio-analytical and biochemistry studies, including assessment of mitogen-activated protein kinase (MAPK) signal transduction changes by Western blot analysis.
Results: A2E-like derivative under blue light irradiation was found to be suitable for bioanalytical research involving mass spectrometry studies. The bromine atom improved the detection of A2E MS fragments through the doublet Br isotope peaks. Blue light irradiation of A2E-Br results in the formation of reactive derivative that by MS/MS lead to aldehyde and dioxole fragments. We were able to show that A2E-Br cause similar toxic effects as the A2E to RPE cells following blue light exposure. MAPK pathway members were found to be activated following RPE loaded with A2E-Br and blue light irradiation.
Conclusions: Investigating A2E-like compound modification under blue light and tracing some of the MAP-kinase intracellular changes enable us to obtain a better understanding of the factors mediating damage and/or taking part in cell rescue in retinal diseases and suggesting new target for A2E mediated damage prevention.

INTRAVITREAL BEVACIZUMAB (AVASTIN) FOR NEOVASCULAR AGE-RELATED MACULAR DEGENERATION

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Introduction: The purpose of this study is to report the visual and anatomic outcome of intravitreal bevacizumab (Avastin) injection in the treatment of exudative age-related macular degeneration (AMD).
Patients / Methods: Interventional, consecutive, retrospective case series. Forty-five eyes of 45 patients with subfoveal neovascular AMD received intravitreal bevacizumab (1.25 mg) until macular edema, subretinal fluid, and/or pigment epithelial detachment resolved. Outcome measures include standardized visual acuity, optical coherence tomography (OCT), macular thickness and volume and intraocular pressure, at 24 or more weeks follow-up.
Results: Patients were observed for a median length of follow-up of 48 weeks (range, 24–60 weeks). Twelve eyes had prior treatment with photodynamic therapy. Median vision improved from 20/200 to 20/100 at final visit ($P = 0.04$). Overall, mean OCT macular thickness decreased from 305 µ to 240 µ ($P < 0.001$) at last visit. At last follow-up, all eyes received an average of 2.5 injections. There was no incidence of severe vision loss, adverse ocular effect or systemic side effects.
Conclusions: Short-term results suggest that intravitreal bevacizumab (Avastin) is well tolerated and associated with improvement in VA, decreased retinal thickness by OCT in most patients. Further evaluation of intravitreal bevacizumab for the treatment of choroidal neovascularization is warranted.

ERG

A COMMON FOUNDER MUTATION OF CERKL UNDERLIES AUTOSOMAL RECESSIVE SEVERE RETINAL DEGENERATION WITH EARLY MACULAR INVOLVEMENT IN THE YEMENITE JEWISH POPULATION

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Introduction: Retinitis pigmentosa (RP), the most common form of hereditary retinal degeneration, is a genetically heterogenous disorder. At least 24 genes and loci have been implicated in autosomal recessive (ar) RP, one of which is CERKL, encoding a novel ceramide kinase-like protein. To date, only one CERKL mutation, R257X, has been reported in two unrelated Spanish families segregating nonsyndromic arRP.
Patients / Methods: Haplotype analysis for all known genes and loci underlying autosomal recessive nonsyndromic retinal degeneration was performed in an extended Yemenite Jewish family segregating autosomal recessive severe retinal degeneration with early macular involvement. Mutation screening of the underlying gene was performed by direct sequencing. Following identification of the causative mutation, it was screened for in a panel of 16 additional Yemenite Jewish probands with retinal degeneration. Patients homozygous for this mutation underwent ophthalmic evaluation, including funduscopy, visual field testing and electroretinograms.
Results: In an extended Yemenite Jewish family segregating autosomal recessive severe retinal degeneration with early macular involvement we found evidence for linkage to the CERKL gene. Direct sequencing reveled a homozygous splice-site mutation, c.238+1G>A. This mutation was found in four additional Yemenite Jewish families segregating retinal degeneration. The carrier frequency of this mutation in the Yemenite Jewish population is 4.4%. All chromosomes harboring the c.238+1G>A mutation share the same haplotype, thus indicating a founder effect in the Yemenite Jewish population. All patients homozygous for the c.238+1G>A mutation manifest widespread impairment of rod and cone function with early macular involvement.
Conclusions: c.238+1G>A is a prevalent founder mutation of CERKL, which underlies approximately 30% of retinal degeneration cases in the Yemenite Jewish population. The identification of this mutation will facilitate molecular diagnosis, carrier screening and genetic counseling in this population. c.238+1G>A is associated with an atypical retinal degeneration phenotype, involving both peripheral and central regions of the retina early-on in the disease process.

INCREMENT LIGHT INTENSITIES AFFECTING THE FULL FIELD ELECTRORETINOGRAM IN THE INTEROCULAR AMPLITUDE DIFFERENCES IN NORMAL SUBJECTS.

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Introduction: Increment light intensities affecting the full field electroretinogram in the interocular amplitude differences in normal subjects.
Patients / Methods: 36 subjects, without retinal changes of clinical significance by ophthamoscope, and normal ERG responses were included. They included 20 men and 16 women, with a mean age of 40 (SD 16) years and range of 16–67 years. ERG was recorded in both eyes following the International Society for Clinical Electrophysiology of Vision (ISCEV) standard protocol. The interocular percentage differences of the ERG b-wave amplitudes were calculated and presented as percentiles (25th, 50th, 75th, 95th), means (SD), and medians.
Results: Isolated rod, scotopic maximal in 0dB, +10dB, +20dB light intensities, dark adapted 30 Hz flicker, photopic single flash in 0dB, +5dB light intensities, and light adapted 30 Hz flicker responses were recorded. The median interocular percentage differences in the b-wave amplitudes for the above ERG stimulus responses were 8%, 8%, 7%, 7%, 10%, 10% and 7%, respectively. ANOVA identified smaller b-wave interocular percentage differences for the flicker than the single plash and larger photopic than scotopic ($p=0.015$) however, there was no effect of light intensities ($p>0.05$). The mean interocular percentage differences were 9%, 9%, 9%, 9%,%, 12%, 13% and 8%. The 95th percentiles for the interocular percentage differences were 22%, 19%, 19%, 24%, 28%, 29%, and 17%, respectively.
Conclusions: The interocular percentage differences in the ERG b-wave amplitudes for seven different stimulus responses showed significant difference in our cohort of individuals without clinically significant retinal changes. Flicker and scotopic single flash responses demonstrated lower interocular percentage differences with median of 7–8% and a 95th percentile of 17–24% than the photopic single flash responses with median of 10% and a 95th percentile of 28-29%. However, different light intensities demonstrated similar interocular percentage differences. Our findings should be useful for determining sample sizes in future therapeutic trials on retinal diseases with monocular therapeutic strategies and may also have application for the more accurate detection of asymmetric retinal disease.

PROTECTIVE EFFECT OF ZINC-DESFERRIOXAMINE COMPLEX IN THE RD10 MOUSE MODEL OF RETINAL DEGENERATION

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Introduction: Iron-associated oxidative injury may play a role in retinal degenerations such as AMD and retinitis pigmentosa (RP). The novel metalo-complex Zinc-Desferrioxamine (Zn/DFO) may ameliorate such injury by chelation of labile iron in combination with release of Zinc in areas of increased iron levels. The purpose of the present study was to evaluate whether treatment with Zn/DFO can reduce the rate and extent of retinal degeneration in the rd10 mouse model of RP.
Patients / Methods: During the first 6 weeks (6w) of life, intraperitoneal injections of ZnDFO (2.5mg/kg) were performed in rd10 mice three times a week. Three control groups were similarly injected with either saline, ZnCl2, or desferrioxamine (DFO) alone in equivalent concentrations. At 3w, 4.5w and 6w of age, the course and extent of retinal degeneration was assessed using electrophysiologic (full field electroretinogram – ERG), quantitative histologic and immunohistochemical techniques.
Results: Zn/DFO-treated animals showed significantly higher ERG amplitudes at both the 3 and 4.5w time points (mean b-wave amplitude at highest stimulus intensity at 3w: 402.8±53.2 microvolts versus 251.3±35.1 microvolts in saline-injected mice, $p<0.05$; at 4.5w: 174.0±19.9 microvolts versus 110.6±19.1 microvolts, $p<0.05$). A partial rescue effect of Zn and DFO alone was present at 4.5w of age. At 6w, ERG was unrecordable in all experimental groups. Morphometric analysis showed corresponding structural rescue: at 4.5w of age, the outer nuclear layer in the peripheral retina was significantly thicker in Zn/DFO-treated mice (8.31±0.46 micrometers versus 6.45±0.55 micrometers in saline-injected animals, $p<0.01$). At 3 and 4.5w, quantitative immunohistochemistry showed a trend towards larger rhodopsin content in Zn/DFO-treated animals as compared with saline-treated mice. At 3w density of Red/Green cones per 100 micrometers of retinal length was significantly higher in Zn/DFO-treated retinas (7.7±0.52 cells versus 5.9±0.06 cells in saline-injected mice, $p<0.05$). At 4.5w retinas from Zn/DFO and saline-injected groups showed the same Red/Green opsin contents.
Conclusions: Intraperitoneal injections of Zn/DFO provide significant protection of retinal function and structure in rd10 mice. We hypothesize that this rescue effect of the Zn/DFO complex is related to its ability to reduce formation of reactive oxygen species by modulation of iron availability.

PROGRESSIVE AND SEVERE STARGARDT-LIKE DISEASE CAUSED BY A NOVEL ABCA4 FOUNDER SPLICING MUTATION

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Introduction: Typical Stargardt disease mainly affects macular function and a large proportion of cases are caused by mutations in the ABCA4 gene. We identified a number of families with an atypical and severe retinal degeneration which initially resembles Stargardt but then progresses to widespread disease. Our purpose was to clinically characterize and genetically analyze this rare form of retinal degeneration.
Patients / Methods: Ophthalmic evaluation included a full clinical exam, perimetry, color vision testing, and full-field electroretinography (FFERG). Genomic DNA was screened for ABCA4 mutations using microarray analysis and direct sequencing. RNA analysis was done by RT-PCR and sequencing.
Results: We recruited 15 patients who suffer from a unique retinal disease and belong to six highly consanguineous Arab-Muslim families from a single village. During early stages of disease, fundoscopic and angiographic findings as well as retinal function testing resemble those of Stargardt disease, including a dark choroid effect on fluorescein angiography and preserved FFERG. However, later in life, severe, widespread cone-rod degeneration ensues. The marked progressive involvement of the retinal periphery distinguishes this phenotype from classic Stargardt disease. Over time, large patches of atrophy and pigment form throughout the retina, and a statistically-significant decrease of retinal function with age is seen on FFERG. Genetic analysis of ABCA4 revealed two novel deletions, p.Cys1150del and c.4254-15del23. One patient, who was a compound heterozygote for these two mutations, manifested typical, limited Stargardt disease. The remaining 14 patients were homozygote for the c.4254-15del23 intronic deletion and suffered from the progressive form of disease. We identified an identical ABCA4 haplotype in all alleles carrying this mutation, indicating a founder mutation. A detailed RT-PCR analysis in normal retina and lymphoblastoid cells revealed the expression of the constitutive ABCA4 transcript as well as three novel transcripts produced by alternative-splicing. The constitutive ABCA4 transcript, however, could not be detected in lymphoblastoid cells of affected homozygote patients.
Conclusions: In the families studied, Stargardt disease evolves into a widespread retinal degeneration with atypical retinal findings. Our results expand the genotype-phenotype correlation of ABCA4, showing that homozygosity for the novel c.4254-15del23 splicing mutation is associated with a severe progressive form of macular and retinal degeneration.

FUNCTIONAL EVALUATION OF THE NEUROPROTECTIVE EFFECT OF GLATIRAMER-ACETATE (COPAXONE) ON THE RAT INNER RETINA DURING MATURATION AND AGING ®

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Introduction: In humans, inner retinal function undergoes age-related developmental and maturation changes, peaking at puberty and declining thereafter. In a previous study we demonstrated that similar age-related changes in inner retinal function take place in the rat. We further demonstrated that the neuroprotective drug, Copaxone (Glatiramer Acetate), preserves inner retinal function after elevation of intraocular pressure in the rat glaucoma model. The aim of this study was to assess the neuroprotective effect of Copaxone treatment on inner retinal function during maturation and aging in the rat.
Patients / Methods: Three litters totaling 17 Lewis rat puppies were raised from birth in normal laboratory conditions (12hr light/dark regime). All rats were treated with Copaxone, SQ, at ages 1, 4, 7 and 11 weeks (33-100 µg, adjusted for body weight) and pattern electroretinogram (PERG) responses of both eyes were recorded during maturation and aging of the rats at 5, 7, 11, 14, 18, 22, 25, 29 and 33 weeks of age. Stimulus was a series of 5 shifting (6.1 Hz) checkerboard patterns of decreasing spatial frequency (0.368-0.023 cycles per degree, cpd), projected on the animal's fundus using a specially-modified direct ophthalmoscope.
Results: We observed a consistent and significant ($P<0.001$) increase of PERG amplitudes between 5 and 29 weeks of age, in response to all gratings. At the age of 33 weeks, we noticed an insignificant ($P>0.05$) amplitude reduction. In the untreated rats we noticed a consistent and significant ($p<0.05$) PERG amplitude increase, peaking at 11 weeks of age. At 14 weeks of age we noticed an amplitude reduction which continued at 18 weeks of age. The amplitude decline between 11 and 18 weeks of age was not significant ($p>0.05$).
Conclusions: The age-related decline in PERG amplitudes (inner retinal function) seen in control animals was not observed in rats treated with Copaxone. It seems that the injections of Copaxone had a beneficial effect on retinal function in the maturing rat, and the activity of the retina continues to increase instead of declining. Such treatment may therefore be used to delay age-related deterioration in visual function. Further studies should be performed to investigate the mechanism of protection.

Genetics

HEREDITARY FAMILY SIGNATURE OF FACIAL EXPRESSION

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Introduction: Although facial expressions of emotion are universal, individual differences create a facial expression ‘‘signature’’ for each person. Yet, is there a unique family facial expression signature? Only a few family studies on the heredity of facial expressions have been performed, none of which compared the gestalt of movements in various emotional states; only a few movements in 1-2 emotional states. No studies, to our knowledge, have compared movements of congenitally blind subjects with their relatives
Patients / Methods: Using two types of analyses, we show a correlation between movements of congenitally blind subjects with those of their sighted relatives in think-concentrate, sadness, anger, disgust, joy, and surprise and provide evidence for a unique family facial expression signature. In the analysis ‘‘in-out family test’’ a particular movement was compared each time across subjects. In the analysis ‘‘the classification test’’ the congenitally blind subjects were classified to their families according to the gestalt of movements.
Results: Results of the “In-Out family test” show that the frequency of occurrence of a movement of a congenitally blind subject in his family is significantly higher than that outside of his family in think-concentrate, sadness, and anger. Results of ‘‘the classification test’’ show 80% correct classification over the entire interview, 75% in anger, 69% in surprise, 66% in disgust, 60% in joy, 59% in sadness, and 54% in think-concentrate. Analysis of the movements’ frequencies in anger revealed a correlation between the movements’ frequencies of congenitally blind individuals and those of their relatives.
Conclusions: It is shown that the motor patterns underlying facial expressions, have a strong heritable basis, and that visual input is not required. This results in a family facial expression “signature”.

OCULAR BIOMETRY, REFRACTION AND PACHYMETRY IN NEONATES CONCEIVED BY IN VITRO FERTILIZATION VERSUS NATURAL CONCEPTION

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Introduction: We evaluated the effects of IVF on the early development of the eye on full-term healthy infants.
Patients / Methods: The babies were examined from March 1st till August 14th 2006 in the neonatal department, Helen Schneider women's hospital, Rabin medical center. We included full-term newborns after natural conception (NC) or IVF. Data concerning gestational age (GA), birth weight (BW), APGAR score, head circumference, body length (BL), and mode of conception (IVF versus NC) were assembled. Full ophthalmological examination was performed, including cycloplegic refraction, intraocular pressure (IOP) measurement, keratometry, pachymetry, ultrasound biometry, and funduscopy.
Results: A total of 66 neonates (132 eyes) were examined, including 32 IVF and 34 NC babies. In the IVF group 18/32 (56%) were females, whereas in the NC group 19/34 (56%) were males. There were no statistically significant differences between the conception groups in GA, gender, head circumference, IOP, axial length, anterior chamber depth, and lens thickness. The IVF babies had lower BW and BL than the NC neonates ($p=0.032$, t-test). The keratometric and pachymetric values were higher in the IVF than in the NC group ($p=0.009$, $p=0.048$ respectively, t-test). Although the IVF babies were less myopic than the NC babies, the myopia was found to be associated with family history, rather than with the mode of conception.
Conclusions: IVF babies had steeper and thicker corneas as compared with NC babies, as well as lower BW and BL. These differences may reflect a delay in anterior chamber development, and should be followed longitudinally.

A WHOLE GENOME HOMOZYGOSITY SCAN OF A FAMILY AFFECTED BY AUTOSOMAL RECESSIVE CONE-ROD DYSTROPHY WITH HIGH MYOPIA SUGGESTS LINKAGE TO CHROMOSOME 4P.

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Introduction: Purpose: To describe the phenotype of an autosomal recessive cone-rod dystrophy with high myopia, and identify the chromosomal locus.
Patients / Methods: Nine members of a consanguineous Arab family were examined clinically and also underwent fluorescein angiography (FA), biometry, and electrodiagnostic testing. Blood samples were collected for DNA extraction. A homozygousity genome wide scan was performed using > 382 polymorphic microsatellite markers on genomic DNA from 3 affected family members. Regions of homozygosity were further analyzed in all family members.
Results: The phenotype is characterized by severe visual impairment evident in the first decade of life. The macula has a bull`s-eye appearance without “flavimaculatus flecks”, and peripheral retina has occasional pigmentary clumps. FA demonstrates bull`s-eye atrophy of the macula and underlying RPE, with no “dark choroid” pattern. Both cone and rod functions were extinguished in electroretinogram testing. All affected sibs had high myopia with axial lengths that exceeds 25.3 mm. A region of 3 Mb on chromosome 4p fully segregates with the disease within the family. Maximal lod scores > 2.6 were obtained for markers within this region at theta=0. This region overlaps the Stargardt 4 locus.
Conclusions: This data suggest that autosomal recessive cone-rod dystrophy with high myopia, and Stargardt are allelic.

A MISSENSE CNGA3 MUTATION RARE IN WESTERN POPULATIONS IS FREQUENT AMONG JEWISH AND MUSLIM PATIENTS WITH ACHROMATOPSIA

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Introduction: Achromatopsia is a heterogeneous autosomal recessive condition characterized by absence of cone function, with a prevalence of 1:30,000. Patients manifest reduced visual acuity, nystagmus, photophobia and have no color vision. Three causative genes (CNGA3, CNGB3, and GNAT2) have been identified to date, all specifically involved in cone phototransduction. In addition, a locus on chromosome 14 is predicted to harbor a yet unknown gene.
Patients / Methods: Nine Arab-Muslim families and seven Jewish families with the primary diagnosis of achromatopsia were recruited for this study. Clinical evaluation included a detailed family history, a full ophthalmologic exam, assessment of refractive error, color vision testing and full-field electroretinography (ERG). Blood samples were collected from the patients and family members and genomic DNA was extracted. A screen for specific previously-reported mutations in the known genes was conducted by restriction analysis and verified by sequencing. When required, this was followed by sequencing analysis to identify novel mutations.
Results: The most frequently reported achromatopsia-causing mutation in the literature, c.1148delC in the CNGB3 gene, was absent in all studied Israeli patients with the disease. In contrast, a missense mutation (V529M in the CNGA3 gene) that was reported in only three patients worldwide, was found homozygously in 5 out of 16 index cases in our cohort. Two additional patients were heterozygote for this mutation, one of whom was a compound heterozygote with a novel missense mutation (G548R) on the other allele of CNGA3. Interestingly, the V529M mutation was found in two groups of patients: Arab-Muslim families and Jewish families from Iraq, Iran, Buchara, and Afghanistan. The mutation was absent in 13 patients with the diagnosis of cone dystrophy. Haplotype analysis using markers located within the CNGA3 gene suggested two different CNGA3 haplotypes in both groups.
Conclusions: We report here of the identification of CNGA3 mutations in 44% of cases with achromatopsia. Our results demonstrate genetic differences in the etiology of achromatopsia between the Israeli population and the American / European populations that were thus far reported in the literature. Identification of the causative mutations will now allow improved genetic consuling to the patients as well as pre-natal diagnosis when needed.

GENETIC DISSECTION OF PAX6 DOSAGE REQUIRMENTS IN THE DEVELOPING EYE

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Introduction: Aniridia is a panocular disorder denominated after noticeable iris hypoplasia. Affected patients often have severe visual impairment, and complications include cataracts, corneal vascularisation and glaucoma. Most of the familial aniridia are caused by mutations in the PAX6 gene. Pax6 is a known master regulator of eye development as it is invariably essential for the formation of eyes in different organisms. In mice, mutations in one allele of Pax6 lead to phenotype that is similar to the human condition and accompanied by reduction in the external size of the eye.
Patients / Methods: We are investigating the temporal and tissue specific functions of Pax6 by employing the Cre/loxP approach. Using the LeCre and a-Cre mouse lines enables us to eliminate one allele of Pax6 from either the lens or the distal part of the retina, and by that provides us a tool to explore the phenomenon of Pax6 dosage requirements in the developing eye.
Results: Exclusive elimination of one allele of Pax6 from the distal part of the retina results in a significant reduction of the iris size, seen as early as E17.5. Antibody staining of E14.5 eye sections assisted us in defining the borders of the area that will give rise to the iris and showed that the mutant progenitors' pool is significantly smaller then the wild type. Induced deletion of one copy of Pax6 from the lens and cornea causes reduction in the circumference of the eye ball and lens, cloudy cornea and iris abnormalities.
Conclusions: Somatic ablation of Pax6 from either the distal retina or lens causes ocular phenotypes resemble aniridia. The finding that heterozygous mutation is sufficient to induce iris abnormalities in both of the somatic mutants implies that Pax6 dosage plays an important role in the development of this structure.

Lens and Cataract

IS IT SAFE TO USE CELLULAR TELEPHONES?

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Introduction: Purpose: To investigate the nature of the damage resulting from electromagnetic radiation exposure in the frequency range 824 MHz-1200MHz on the eye lens in situ and to determine the mechanisms of damage.
Patients / Methods: Methods: Bovine lenses were incubated in organ culture conditions for 16 days. A total of 60 lenses were used in this study. The lenses were divided into two groups: (1) Control group kept in culture conditions for 16 days. (2) Electromagnetic radiation exposure group of 1.1GHz, 2.22mW for 8 days and kept in culture up to 16 days. At the end of the culture period lenses were taken for analysis by inverted microscopy, nucleic acid staining of the lens epithelium and analysis of lens proteins by 2D gels.
Results: Results: Exposure to 2.22mW at 1.1GHz caused damage to lens optical quality, changes in lens fiber structure at the posterior pole, aggregation of lens proteins and damage to lens epithelial cells. The damage appeared at the lens epithelial layer accompanied by condensation of nuclei of cells.
Conclusions: Conclusions: Electromagnetic radiation has a clear deleterious impact on the eye lens. Exposure above specific energy levels affects lens epithelium and lens fiber cells as demonstrated by inverted microscopy, nucleic acid staining and by 2D gels. This study was supported in part by Guzik Ophthalmology Research Fund.

EXPERIMENTAL STUDY ON THE SAFETY AND EFFICACY OF THE SEELENS – NEW HYDROPHILIC ACRYLIC IOL

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Introduction: Hydrophilic acrylic foldable intraocular lenses (IOL) are widely used following cataract removal by phacoemulsification. These IOLs have high water content providing exellent biocompatibility .The two main disadvantages of the hydrophilic lenses are a higher rate of PCOcomparing to hydrophobic IOLs, and a more flexible haptic that may lead to IOL decentration . Hanita Lenses ltd designed a new type of hydrophilic acrylic PC-IOLwith thicker haptics and a 360 deg double square edge, named "See Lens" to reduce PCO and increase stability.The lens was studied in a rabbit model and compared to "B lens" to estimate PCO, capsular deformity and IOL centration and stability .

Patients / Methods: Eight white New-zealand rabbits underwent phacoemulsification and IOL implantation, one eye was implanted with SeeLens and the second eye of each rabbit was implanted with B Lens . The rabbits were examined 4 ,6 and 8 weeks postoperatively and then sacrified ,eyeballs were enucleated and examined clinically using the Miake-Apple technique and then cut , stained and microscopically examined for IOL location, centration and PCO formation.

Results: There were no intraoperative complications and no evidence of postoperative inflamation. Two eyes from the B-lens group were found to have irido-capsular adhesions. When viewed from vitreus side (Miake –Apple technique) most B lenses' haptics tended to bend towards the optic , reducing the contact area between the IOL and the capsule. SeeLens' haptics demonstrated a wide contact area contributing to IOL stabilityand centration. Mean PCO score and surface were not significantly different between the groups, both in clinical examination and in histological examination of the capsules.

Conclusions: In this rabbit study, See Lens was as safe as the control B Lens in terms of biocompatibility and surgical behaviour. The short and intermediate term PCO scores were similar in both IOLs. The haptic design of See lens was apparently superior to that of the B-lens and maintained a wide loop-capsular contact resistant to capsular contraction forces. This was manifested in significantly better IOL centration . It is speculated that this haptic design would also be superior for sulcus fixation and may reduce long term PCO rate.

THE QUATER SPHERE LENS: A NEW OPTICAL ELEMENT WITH OPTICAL AND OPHTHALMIC IMPLEMENTATIONS

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Introduction: A new optical element invented and patented by the author, consisting of one quarter of a transparent sphere will be presented. The patent was issued with partial financing by the Chief Scientist of the Israel Ministry of Science and Commerce.
Patients / Methods: The new optical element effectively combines the Amici roof prism and two plano convex lenses in a compact, easy to manufacture construct. The Quarter Sphere Lens (QSL) aquires an image at one of its faces and creates a real non-inverted image of it at a plane 90 degrees to the original.
Results: Implementation for creating a wide angle viewing non inverted image system for the extreme retinal periphery will be presented. A similar system for vitreo retinal surgery will be presented. An extremely light and easy to manufacture design for binoculars and low vision aids will be presented. A design for a 360 degrees coupling of fiber optics systems with potential uses in surgical fiber optics systems and in the optical industry at large will be presented.
Conclusions: A simple new patented optical element with potential implementations in ophthalmology, other fields of medicine and optics cosisting of a Quarter Sphere Lens will be presented.

AVOIDING POSTOPERATIVE IOP ELEVATION IN PHACOEMULSIFICATION CATARACT SURGERY WITH THE USE OF AN ANTERIOR CHAMBER MAINTAINER WITHOUT VISCOELASTIC MATERIAL

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Introduction: Purpose: To evaluate the efficacy as well as the safety of Phacoemulsification cataract surgery and foldable PCIOL implantation while using anterior chamber maintainer (ACM) with viscoelastic material (procedure 1) and without viscoelastic material (procedure 2).
Patients / Methods: Methods: This retrospective interventional comparative case-control study included 23 consecutive cases of procedure No 1, and 23 consecutive cases of procedure No 2. Patients were evaluated preoperatively on the day of the operation and 2-6 hours postoperatively as well as on the following day. IOP and post operative complications were monitored on each evaluation
Results: Results: No statistically significant difference in IOP measurement preoperatively and 2-6 hours postoperative was found between both procedures. At day 1 postoperatively there was statistically significant in IOP rise on procedure 2 group ($P \leq 0.01$) compared with procedure 1 group ($P \leq 0.01$). No major postoperative complications differences between the 2 groups were found.
Conclusions: Conclusion: Cataract phacoemulsification with foldable PC IOL implantation with the use of an anterior chamber maintainer and without viscoelastic material is effective yet safe in preventing IOP elevation on day 1 post operatively. This technique may be beneficial especially with glaucoma patients where IOP rises is to be avoided.

Oncology and Tumors

CHARACTERIZING MOLECULAR PATHWAYS WHICH UNDERLIE THE DEVELOPMENT OF METASTASES FROM UVEAL MELANOMA

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Introduction: Uveal melanoma (UM) is associated with death due to the development of systemic metastases in about 50% of patients. We aim to obtain insight into the molecular pathways which underlie the development of metastases from UM in order to identify potential novel therapeutic targets for this disease.
Patients / Methods: Bioinformatics was applied on a microarray dataset containing gene expression patterns from seven primary UM and seven liver metastases from UM, respectively. Gene expression patterns were compared across UM metastases and variety of normal and malignant tissues. Transcription factors which may regulate expression of metastases associated genes were identified using two complementary bioinformatics approaches. Results were validated using real time quantitative RT-PCR (QPCR) and immunohistochemistry (IHC).
Results: Gene expression pattern of liver metastases from UM shared similarities with expression pattern of normal liver tissue. Several transcription factors which potentially regulate expression of metastases associated genes were identified among them NFkB. NFkB2 showed higher mRNA levels in UM metastases compared with the primary tumor according to microarray analysis (false discovery rate = 5%, significance analysis for microarrays) and QPCR ($P = 0.03$, t-test), and higher protein levels according to IHC ($P = 0.002$, t-test). Altered mRNA levels of additional members of the NFkB family and of genes associated with NFkB signal transduction pathways among them NFkB1, RelA, RelB, GADD45β, HHIP, CSF2 and CDK4 were also detected by microarray and QPCR. CDK4 also showed altered protein levels according to IHC ($P = 0.01$, t-test).
Conclusions: Gene expression similarities between liver metastases from UM and normal liver tissue may either be related to the predilection of such metastases to develop in liver or, alternatively, may be secondary to the effect of liver microenvironment. Several members of the NFkB family show altered expression in liver metastases from UM. Based on their known function in other malignancies, this pathway may be important for the growth of UM metastases.

PROGESTERONE RECEPTOR AND C-KIT EXPRESSION IN ORBITAL CAVERNOUS HEMANGIOMAS

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Introduction: Cavernous hemangioma is the most common benign adult tumor of the orbit. Hormonal changes can effect vascular neoplasms, and in one single case series reported in the literature progesterone receptors were found present in all orbital cavernous hemangiomas. The C kit protein is a tyrosine kinase growth factor that stimulates cancerous tissue cell growth, and has been associated specifically with gastrointestinal stromal tumours among other neoplasms. Tyrosine kinase inhibitors are used in the treatment of these tumours. The purpose of our study was to examine the presence of Progesterone receptors and the C – kit protein in 14 cases of orbital cavernous hemangioma.

Patients / Methods: 14 cases operated in Meir Medical Center between 1999 and 2005 were included in the study. The patients, age, sex and tumour size were recorded and all cavernous hemangiomas underwent automated immunohistochemical staining for progesterone receptors and C- kit protein.

Results: There were 7 males and 7 females, with age ranging between 31 and 70 years old. Size of tumours after fixation in formaline ranged between 0.4 X 1.0 X 1.5 and 1.8X1.8X 3.5 cm. Staining for progesterone receptors was strongly positive in 6 cases, weakly positive in 6 cases and negative in 2 cases. C- kit staining was positive in all 14 cases.

Conclusions: We found that the presence of progesterone receptors varies in orbital cavernous hemangiomasand thus our results differ from those published previously. C – kit proteins stained positively in all of our orbital hemangioma cases and this opens the possability for future clinical and treatment implications in the management of this disease.

INTRAVITREAL INJECTIONS OF METHOTREXATE FOR THE TREATMENT OF VITREORETINAL LYMPHOMA

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Introduction: Purpose: To describe our ten years of experience in treating vitreoretinal lymphoma by intravitreal injections of methotrexate (MTX).
Patients / Methods: Methods: Patients with suspected intraocular lymphoma underwent a diagnostic vitrectomy. Samples were sent for cytology, gene rearrangement and cytokine evaluation. Serum was collected for evaluation of cytokine levels. Positive results have led to treatment of patients by injections of 400 µg/0.1 ml methotrexate intravitreally under topical anesthesia. According to our protocol, injections are administered twice weekly for 4 weeks, once weekly for 8 weeks, and then once monthly for 9 months, for a total of 25 injections.
Results: Results: Over the past 10 years we have treated 45 eyes of 26 patients; 7 patients had monocular involvement, and 19 binocular. Twenty-three patients had B-cell lymphoma, and three had T-cell lymphoma. All patients had a complete response after a mean of 6 (range: 2 -16) injections of MTX . None of the patients had an intraocular recurrence. The most common side effects were hyperemia and corneal epitheliopathy, which usually appeared after the third injection and began to subside when the intervals between injections increased. Both the vitreal and serum samples showed a high IL-10 to IL-6 ratio, compatible with the diagnosis of lymphoma.
Conclusions: Conclusions: Vitreoretinal lymphoma can be controlled effectively and without serious adverse reactions by intravitreal MTX injections. The treatment protocol described herein has resulted in, so far, no intraocular recurrences and with bearable side effects .

TPS - A CYTOKERATIN MARKER, AS A POTENTIAL BLOOD MARKER FOR DETECTING METASTATIC UVEAL MELANOMA

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Introduction: Purpose: To evaluate the possible role of the level of serum TPS (tissue polypeptide specific antigen, a cytokeratin 18 fragment), previously shown to be over-expressed in metastatic uveal melanoma, in differentiating between uveal melanoma patients with and without metastases.
Patients / Methods: Methods: The study included three groups of patients: 64 uveal melanoma patients who remained disease-free (DF) for at least 10 years; 37 patients with liver metastases of uveal melanoma, in 20 of whom we had documented pre- and post-metastasis levels; and 53 controls without a history of any malignant disease. Serum levels of TPS (μ/L) were detected by ELISA (IDL, Sweden). Statistical analysis included t-test, sign test (non-parametric), ANOVA, and ROC analysis. The TPS analysis was compared to markers we have studied previously: Osteopontin (OPN), MIA, and S-100β.
Results: Results: The study demonstrated a statistically significant difference between TPS levels in patients with metastatic uveal melanoma (139.63 + 22.20), DF patients (69.29 + 9.76), and controls (54.23 + 0.01), $p < 0.0001$. Significant differences were found between the levels of TPS in the pre-and post-metastatic stage, $p < 0.01$. ROC analysis of the metastatic group vs. DF patients revealed AUC for TPS alone - 71%; for TPS and OPN - 82%; for TPS, OPN AND S-100 – 84%; and for the combination of all four markers – 86%.
Conclusions: Conclusions: Serum TPS, like OPN, MIA and S-100β levels, distinguishes well between metastatic and DF patients or controls, and therefore may serve as a marker for early detection of metastases in patients with uveal melanoma.

EPIGENETIC SILENCING STATUS OF MULTIPLE GENES IN UVEAL MELANOMA

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Introduction: Aberrant promoter hypermethylation of CpG islands is thought to play an important role in the inactivation of tumor supressor genes (TSG) in cancer. In cutaneous melanoma, high methylation rate for O6-methylguanine DNA methyltransferase (MGMT), death-associated protein-kinase gene (DAP-kinase) and RARB2, and RASSF1A was previously reported. As uveal melanoma (UM) may resemble cutaneous melanoma and share the same origin from the neural crest, we suggest determining the role of epigenetic silencing of these genes in UM. To further explore the role of epigenetic genes inactivation in UM, we investigated the methylation status of SOCS-1, IGF-2, RUNX3, NEUROG1 and CACNA1G commonly inactivated in other human tumors. Methylation of at least 3 of these genes may represent a distinct trait referred to as CpG island methylator phenotype (CIMP). CIMP is considered to be a charaterstic feature for the serrated pathway of human tumorigenesis. In this study, we sought to investigate the role of epigenetic inactivation of multiple genes in UM.
Patients / Methods: We investigated the methylation status of 9 candidate cancer-related genes that are frequently epigenetically inactivated in melanoma: MGMT, DAP-K, RARB2, RASSF1A and CIMP related genes: SOCS-1, IGF-2, RUNX3, NEUROG1 and CACNA1G by real time Quantitative Mehylation Specific PCR (QMSP) analysis, after sodium bisulfite modification in 20 UM samples.
Results: The methylation status of genes commonly inactivatd in cutaneous melanoma was 5% in MGMT, 5% in DAP-kinase, none in RARB2, and 71% in RASSF1A. None of our samples presented CIMP positive phenotype. We observed methylation in RUNX3 (25%), NEUROG1 (5%), and CACNA1G (5%). No methylation in SOCS-1 and IGF-2.
Conclusions: High frequency of promotor hypermethylation was detected only for RASSF1A. Given the fact that mutations in genes of the RAS pathway are rarely observed in UM, epigenetic inactivation of RASSF1A may be an alternative mechanism for formation of UM. The low frequency of promotor methylation of TSG commonly inactivated in cutaneous melanoma further stratified the different tumorigenesis pathway between these tumors. The negative CIMP in UM is in accord with the lack of BRAF mutations previously described, which is correlated to positive CIMP tumors.

COMBINED STEROID ADMINISTRATION VIA INTRALESIONAL INJECTION AND SUB-TENON'S INFUSION FOR THE TREATMENT OF PERIORBITAL AND ORBITAL CAPILLARY HEMANGIOMA

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Introduction: To evaluate the effect of combined intralesional and sub-Tenon's administration of steroids for the treatment of periocular and orbital capillary hemangioma following failed intralesional and systemic steriod treatments.
Patients / Methods: A study was conducted by longitudinal, interventional, retrospective single-institution case series. Seven babies with resistant periorbital and orbital capillary hemangioma who attended our tertiary center from 2000 to 2005 were treated with a novel combined technique of steriod administration. Only babies with extensive pressure on the eye globe, refractive anisometropia, proptosis and blocking of the visual axis were considered eligible for the protocol. Treatment consisted of intralesional injection of a mixture of betamethasone 6mg/ cc and triamcinolone 10mg/cc, by body weight, together with sub-Tenon's infusion of betamethasone 6mg/cc and triamcinolone 40mg/cc, up to a volume of 1cc, close to the orbital lesion, in the same session. Condition of visual axis, presence/absence of proptosis, change in 4 refractive parameters, and parental satisfaction were evaluated.
Results: Non of the babies had proptosis or visual axis obstruction after treatment. Mean spherical equivalent decreased in 34%, but difference was not statistically significant (p=0.09). No early or late side effects were observed. The parental satisfaction score during follow-up was 9/10. The mean time to significant improvement was 96.43±58.3 days.
Conclusions: Combined local steriod administration by posterior sub-Tenon's infusion and intralesional injection in babies with extensive capillary hemangioma is associated with a good and satisfactory anatomical and functional outcome and no systemic side effects.

Visual Function

THE PATTERN OF CORRELATION BETWEEN VISUAL ACUITY AND COLOR VISION IN DIFFERENT TYPES OF VISUAL LOSS

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Introduction: No reference is available comparing the correlations between color vision and visual acuity loss in the different groups of diseases, therefore the use of color vision as a clue for diagnosis cannot be used effectively. This study suggests practical guidelines to predict the cause of visual loss based on color vision and visual acuity loss.
Patients / Methods: 249 patients were examined for their best-corrected visual acuity and for the Ishihara color vision test. Each patient had only one definite cause for the visual loss. Patients were divided into 5 categories according to the visual loss etiology: Non compressive optic neuropathies, Compressive optic neuropathy, Macular diseases, Media opacities and Amblyopia. Color vision was correlated to the visual acuity in every group separately.
Results: The proportion of having a certain disease in different subgroups of visual acuity and color vision was statistically significant ($c^2=17.712, p<0.5$). For each level of color vision, there is a significant difference in disease frequency for the different visual acuity level. Compressive optic neuropathy is the most expected disease to be diagnosed with the worst color vision, and the near normal visual acuity. For color vision of 5.5-10 plates and visual acuity of 20/15-20/63, optic neuropathy is the most expected diseases, macular disease in the range of 200/20-160/20, and media opacities in the range of 20/200-20/1200 For better color vision of 10.5-15 plates, there is not a definite expected disease in the range of 20/15-20/63. But for the visual acuity range of 20/160-20/1200, amblyopia and media opacity are the most expected diseases.
Conclusions: Different causes of visual acuity loss affect the Ishihara color vision test in dissimilar severity. For a certain visual acuity the degree of color vision loss may provide a clue to the etiology of the visual loss.

THE RELATION BETWEEN NIGHT MYOPIA AND NIGHTTIME MOTOR VEHICLE ACCIDENTS

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Introduction: Night myopia is known to reduce vision at night. the purpose this study was to investigate the relation between night myopia and the occurrence of night-time motor vehicle accidents in a group of professional drivers.
Patients / Methods: We examined 136 professional drivers. Refraction was determined in full illumination (100 cd/m2) and after sitting in darkness for five minutes. The change in refraction, indicative of night myopia, was correlated with the number of motor vehicle accidents in which each driver was involved (detailed in their personal files) and with a visual complaints questionnaire.
Results: Mean age of the study group was 21.0 years. Mean spherical refraction changed from +0.11 diopters (D) in light to –0.17 D after dark adaptation for five minutes. Night myopia was found in 34 drivers (25%), with a mean of –1.2D (range –0.75 to –3.50D). There was no statistically significant difference between these drivers and the rest of the group in the results of the visual complaints questionnaire, or in the number of accidents performed during the day. However, drivers with more than 0.75D myopic shift were involved in more accidents during the night than the rest of the group (P=0.044).
Conclusions: In this study population, drivers with night myopia of more than 0.75D were more likely to be involved in nighttime crashes. This may imply that examination for night myopia should be done in selected groups of drivers.

NEUROVISION™ TREATMENT FOR MODERATE AMBLYOPIA

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Introduction: NeuroVision™ is a non-invasive, patient-specific computerized treatment based on visual stimulation and facilitation of neural connections responsible for vision. The treatment is indicated in adult amblyopia, patients 9 years or older. Follow up of up to 2 years shows good retention of visual improvement.
Patients / Methods: A total of 11 Patients with moderate amblyopia completed NeuroVision treatment, a computer-based interface in which a repetitive set of visual exercises is performed. Visual performance was obtained at baseline and after completing the treatment (40-44 weeks). The assessment of visual performance includes measuring best corrected visual acuity (BCVA) using ETDRS chart, contrast sensitivity (Optec-6500) and stereoacuiteis (Titmus test) tests.
Results: Mean improvement in BCVA (Log MAR) was statistically significant ($p=0.004$), from 0.59 ± 0.22 to 0.37 ± 0.24 at baseline to the end of treatment respectively. In contrast sensitivity, although there was a significant increase in low frequency scores ($p< 0.05$), there was not a significant change in high frequency scores ($p>0.05$). Median stereoacuities were 250 seconds of arc at baseline and improved to 100 seconds of arc after the treatment.
Conclusions: NeuroVision™, a noninvasive treatment based on the concept of perceptual learning, can improve the visual performance of adult amblyopic patients.

THE EFFECTS OF REFRACTIVE SURGERY ON AMBLYOPIA IN ADULT EYES

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Introduction: The purpose of this study was to evaluate the effects of refractive surgery in adult patients with mild to moderate amblyopia.
Patients / Methods: A retrospective review was performed on patients with amblyopia (BSCVA ≤0.6) who underwent laser vision correction, using the Technolas 217Z excimer laser. The pre-operative best spectacle corrected visual acuity (BSCVA), post-operative un-corrected visual acuity (UCVA), pre-operative and post-operative manifest refraction were recorded. Patients were grouped according to the pre-operative spherical equivalent (SEQ): Group A - myopia higher than -6.00 D; Group B - myopia between -1.00 D to -6.00 D.
Results: Seventy-seven consecutive amblyopic eyes (68 patients) received laser treatment for correction of myopia from April 2003 to March 2006. Of these, 53 eyes had high myopia (Group A; mean pre-operative SEQ -9.46 ± 2.10 D) and 22 eyes had mild to moderate myopia (Group B; mean -3.88 ± 1.31 D). In 50 patients, one eye was amblyopic. In 9 patients both eyes were amblyopic and both had refractive surgery. In another 9 patients, only one eye was amblyopic and this eye only had refractive surgery. In group A, the mean preoperative BSCVA improved in amblyopic eyes from 0.52 ± 0.11 to 0.62 ± 0.20 post-operatively (average gain of 0.10 ± 0.16; $p<0.001$). In group B, the mean BSCVA improved from 0.54 ± 0.6 pre-operatively to 0.71±0.21 after surgery (mean gain of 0.18 ± 0.19; $p=0.037$). The average gain in BSCVA after refractive surgery in amblyopic eyes (0.11) was significantly higher compared with the mean gain in the fellow non amblyopic eyes (0.02). The BSCVA improved by one or more lines in 31 (58.5%) and in 17 (77.3%) patients in groups A and B, respectively, remained unchanged in 15 (28.3%) and in 3 (13.6%) patients in gropus A and B, respectively, and decreased by one or more lines in 7 (13.2%) and in 2 (9.1%) patients in group A and in group B, respectively.
Conclusions: Laser refractive surgery for myopic correction can improve the BSCVA in eyes with mild to moderate amblyopia in adults. This effect is more significant in myopia lower than -6.00 D.

Infections

PREVENTION OF STAPHYLOCOCCUS EPIDERMIDIS ENDOPHTHALMITIS BY PRESOAKED COLLAGEN SHIELDS COMPARED WITH TOPICAL PROPHYLAXIS

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Introduction: Purpose: To compare the prophylaxis potential of collagen shields presoaked in antibiotic solutions versus topical antibiotic drops alone after bacterial anterior chamber challenge in a rabbit model.
Patients / Methods: Methods: 40 rabbits received bilateral 0.03 cc intracameral injections of S. epidermidis (5x108 cfu). Four groups (10 rabbits each) had their eyes randomized: 1) 3mg/ml gatifloxacin(Zymar) drops, or collagen shield presoaked in 3mg/ml gatifloxacin (Zymar), 2) gatifloxacin (Zymar) drops, or shield in 10mg/ml gatifloxacin (Tequin), 3) 5mg/ml moxifloxacin (Vigamox) drops, or shield in 5mg/ml moxifloxacin (Vigamox), and 4) BSS drops, or shield in BSS. Each eye received one drop of gatifloxacin (Zymar), moxifloxacin(Vigamox), or BSS four times starting one hour before bacteria injection. The eyelids were sutured and the respective topical antibiotic/BSS was administered every two hours (five doses total). One day after injection, signs of endophthalmitis were evaluated under slit lamp.
Results: Results: Mean clinical scores of endophthalmitis were 8.47 +/- 3.27 (gatifloxacin drops), 7.1 +/- 3.14 (gatifloxacin shields), 8.33 +/- 4.08 (Tequin shields), 8.4 +/- 2.13 (moxifloxacin drops), 10.15 +/- 3.97 (moxifloxacin shields), 11.45 +/- 2.97 (BSS drops), and 11.9 +/- 1.91 (BSS shields). All antibiotic groups had significantly lower incidences of endophthalmitis (score greater than 9.5) than the BSS control. The following comparisons were statistically significant: BSS shields vs. gatifloxacin shields ($p=0.00105$), and gatifloxacin shields vs. vigamox shields ($p=0.0346$). The mean clinical scores for the presoaked shields were not significantly different than their counterparts that only received the topical antibiotic drops.
Conclusions: Conclusion: Topical antibiotic therapy pre- and post-intraocular bacteria challenge could prevent bacterial endophthalmitis in rabbits. Prophylaxis with a 3mg/ml gatifloxacin (Zymar) presoaked collagen shield was associated with lower rates of endophthalmitis than prophylaxis with 5mg/ml moxifloxacin (Vigamox) presoaked shields.

INTRAVITREAL STAPHYLOLYSIN TREATMENT OF S. AUREUS EXPERIMENTAL ENDOPHTHALMITIS - FURTHER STUDIES

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Introduction: Staphylolysin is a staphylolytic protease that we showed to be effective against experimental keratitis. More recently, we found a promising effect of staphylolysin also against experimental Staphylococcal endophthalmitis. In the current study, we evaluated the efficacy of repeated intravitreal injections of Staphylolysin in the same model. The effect of intravitreal Staphylolysin injection on the eye morphology was also studied.
Patients / Methods: Endophthalmitis was induced in 18 eyes of 18 rats by intravitreal injection of 160 methicillin-resistant S. aureus cells. Rats were randomly assigned to either the treatment group (Staphylolysin 0.5 mg/ml; n=9) or a control group (saline; n=9), each receiving intravitreal injections (10 ul) at 6 and 30 hours post-infection. Forty-eight hours after the induction of endophthalmitis, vitreous samples were collected and processed for bacterial counting. Staphylolysin was also injected intravitreally in four uninfected eyes of four rats. The normal and the injected eyes were enucleated and submitted for histopathological examination.
Results: A statistically significant reduction in the bacterial counts was observed in the Staphylolysin-treated eyes as compared to controls ($p<0.05$). Histopathological analysis showed no structural damage in eyes injected with staphylolysin.
Conclusions: In the current study, we further demonstrated that Staphylolysin can effectively reduce the number of S. aureus cells in an experimental rat model of endophthalmitis and showed that administration of Staphylolysin alone does not cause any structural damage to the eye. Additional studies, including functional examinations, should be performed to assess the potential of Staphylolysin as a new therapeutic tool in the management of Staphylococcal endophthalmitis.

IS THE COMBINATION OF MOXIFLOXACIN AND POVIDONE IODINE MORE EFFECTIVE THAN POVIDONE IODINE ALONE FOR REDUCING BACTERIAL GROWTH IN THE CONJUNCTIVAL SAC ?

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Introduction: The purpose of the study is to asses whether the combination of topical moxifloxacin and povidone iodine is more effective than povidone iodine drops alone as preoperative therapy for sterilization of the conjunctival sac before intraocular surgery
Patients / Methods: An ongoing prospective double-blind controlled study. Included were adult patients, admitted for an elective intraocular operation. Patients were randomly allocated to 2 groups which were treated with either moxifloxacin drops (study group) or saline (control group) given 4 times every 15 minutes for 2 hours prior surgery. All patients were also treated with povidine iodine drops instillated into the conjunctival sac for 3 minutes just before the operation. Cultures were obtained from the conjunctiva cul de sac before (base-line cultures) and immediately after the prophylactic therapy (pre-operative cultures). Microbiology and follow-up clinical data were recorded for each patient.
Results: As of December 2006, 226 patients were enrolled in the study, 111 belonged to the study group, and 115 belonged to the control group. Positive baseline cultures were found in 55(50.9%), and 53(49.1%) of the patients in the study and control groups, respectively. Positive pre-operative cultures were obtained in 2.9% of patients in each group (about 94% sterilization rate). No case of post operative endophthalmitis has been reported.
Conclusions: These preliminary results show there is no benefit in adding topical moxifloxacin to povidone iodine preoperatively. However, since both groups are small, the results are not yet statistically significant. The study is ongoing and overall 500 patients will be included.

Glaucoma and Optic Nerve

TRAUMATIC BRAIN INJURY INDUCED NEUROPROTECTION OF RETINAL GANGLION CELLS TO OPTIC NERVE CRUSH

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Introduction: Optic nerve crush injury leads to death of retinal ganglion cells (RGCs), both as a direct result of the primary injury and via secondary degeneration induced by neurotoxins secreted by dying RGCs. Studies have shown that, if optic nerve crush is preceded by an unrelated injury to another part of the central nervous system, for example, the spinal cord, the ensuing T cell-mediated protective autoimmunity results in a significant increase in RGC survival.
Patients / Methods: In this study, we used the controlled cortical impact paradigm to induce unilateral traumatic brain injury (TBI) in rats at different times before they were contralaterally subjected to a mild optic nerve crush.
Results: Survival of RGCs, assessed 2 weeks after crush injury, was significantly increased when the crush was inflicted 11 days after TBI, but not when the two injuries were concomitant. The beneficial effect was unaffected by injection of low-dose methylprednisolone MP (1mg/kg), but was inhibited after a high-dose injection (30mg/kg). Brain-derived neurotrophic factor (BDNF) mRNA, assayed at intervals after TBI, was increased in the retina ipsilateral to TBI but decreased in the contralateral retina. BDNF peaked 1 day after TBI, decreased on day 11, and rose again on day 21.
Conclusions: Brain injury sustained a certain time before optic nerve injury has a protective effect on RGC survival. This neuroprotective effect, which appears unrelated to retinal BDNF, is inhibited by high-dose MP, commonly used clinically to treat traumatic optic neuropathy.

DIFFERENT MAPK PROTEINS ARE PRESENTED AND ACTIVATED IN THE AQUEOUS HUMOR OF RATS, DEPENDING ON ELEVATED IOP.

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Introduction: The major risk factor for POAG is an elevated intraocular pressure (IOP). The study aim is to investigate the expression of the activated mitogen-activated protein kinases (MAPK), extracellular-regulated kinase (ERK), c-jun N-terminal kinase (JNK) and p38, in the aqueous humor of control and induced elevated IOP rats.
Patients / Methods: SD rats weighting 160-180g were injected into the anterior chamber of the right eye, under general & local anesthesia, a 2% Hyaluronic acid solution (HA), once a week. IOP was measured by Tonopen-XL. At different time point Aqueous humor sample were taken from the treated eye and evaluated for MAPK protein expression by western blot analysis. Saline injected eyes and untreated eyes served as control sham.
Results: Phosphorylated–ERK (pERK) and total-ERK (tERK) changes in rat's aqueous humor following HA injection. In tErk1&2 analyses, we were able to show that Erk1&2 are definitively presented at the aqueous humor from control and HA injected rats. The mean levels of Erk2 was higher at the aqueous humor drained from rats eyes with elevated IOP after HA injections. pERK 1&2 were found at the aqueous humor of HA injected and control rats. The mean levels of pErk2 was significantly ($p<0.05$) higher in rats injected HA more than two weeks versus control. Two bands corresponding to total-JNK were found in the control & elevated IOP groups. Only the phosphorylated-JNK2 (pJNK) was found in elevated IOP and control groups. pJNK2 expression was significantly ($p<0.05$) higher in rats injected HA more than two weeks versus control. p-38 total form can be detected only at the elevated IOP rat's aqueous humor. Phosphorylated-p38 was detected in elevated IOP and control
Conclusions: In this study we were able to show the presence of several members of the MAPK signaling pathway, in rat's aqueous humor, an extra-cellular environment. The response of the extra cellular aqueous humor to the continuously elevated IOP resulted in changes in MAPK expression. We suggest the MAPK in the aqueous humor as new target for modifying IOP and trabecular meshwork resistance to flow.

AXONAL DEGENERATION IN GLAUCOMA HAS DIFFERENT MOLECULAR COMPONENTS THAN RETINAL GANGLION CELL APOPTOSIS

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Introduction: It was recently suggested that axonal degeneration pathways in glaucoma may have different molecular components than those in retinal ganglion cell (RGC) apoptosis. Distinct degeneration pathways were activated in various parts of the RGC of DBA/2J mice that developed glaucoma. In this study, we compared changes in molecular pathways between optic nerve (axonal) degeneration and RGC body apoptosis using 2 models of optic nerve and retinal damage: experimental glaucoma and N-Methyl-D-Aspartate (NMDA) toxicity.
Patients / Methods: Experimental glaucoma was induced in 60 rats using the translimbal photocoagulation laser model. The rats were sacrificed on days 1, 4, 8, 14, and 30. Retinal toxicity was induced by intravitreal injections of NMDA in other rats (n=48) that were sacrificed at 12 hours and days 1, 3, and 6. The optic nerves and retinas were excised and immediately frozen for RT-PCR. The expression of BAX, BAD, Bcl-2, Bclxl (bcl-2 family), Gadd45α (p53 pathway) and the anti-apoptotic gene (caspase inhibitor) IAP1 were investigated separately in the optic nerves and retinas.
Results: Significant up-regulation of BAX at day 14 ($p<0.05$) and significant down-regulation of Bcl-2 at days 8 and 14 ($p<0.05$) were detected in the optic nerves and retinas in the glaucoma model. The proapoptotic gene Gadd45α was significantly up-regulated from days 4-14 in the optic nerves ($p<0.05$) and from days 4-30 in the retinas ($p<0.01$). Interestingly, IAP1 was significantly up-regulated in the RGC bodies from days 8-30 ($p<0.01$), but unchanged or down-regulated in the optic nerves ($p=0.07$ for day 4). The NMDA injections model revealed significant up-regulation of the proapoptotic genes BAX, BAD (bcl-2 family) and Gadd45α from 12 hours until 3 days in the optic nerves and retinas($p<0.05$), returning to baseline at 6 days. The pro-survival caspase inhibitor gene IAP1 was significantly up-regulated beginning only 3 days after NMDA injections in the optic nerves and retinas($p< 0.05$), but the pro-survival genes Bcl-2 and Bclxl were not affected by NMDA injections.
Conclusions: Degeneration pathways in experimental glaucoma and NMDA toxicity model may be different. Similar proapoptotic pathways are activated in the RGC body and axon in experimental glaucoma but the activation of pro-survival pathways is significantly different.

SELECTIVE LASER TRABECULOPLASTY (SLT) IN THE TREATMENT OF PRIMARY ANGLE CLOSURE WITH PERSISTENT ELEVATED IOP FOLLOWING IRIDOTOMY

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Introduction: Intraocular pressure (IOP) often remains elevated following laser iridotomy, despite the successful relief of pupillary block and widening of the angle. A multi-center study was conducted to determine whether SLT can lower IOP in eyes with primary angle closure and a patent iridotomy.
Patients / Methods: Eyes with chronic angle closure that had been treated with iridotomy, had an IOP between 21 – 28 mmHg and a gonioscopically visible pigmented trabecular meshwork for at least 90 degrees were enrolled. SLT was applied to the open angle segments. Duration of follow-up was 6 months.
Results: Sixty-seven eyes of 60 patients were treated . During the study period 2 eyes (3%) had trabeculectomy and were considered failures. The mean baseline IOP was 24.7±2.5 mmHg. Mean IOP reduction was 16.9% at 1 month and 21.9% at 6 months. IOP reduction of 2 mmHg or more was observed in 79% and 94% of eyes at 1 and 6 months, respectively. IOP reduction of 3 mmHg or more was observed in 68% and 75% of eyes at 1 and 6 months, respectively. There were no significant or persistent complications.
Conclusions: SLT seems to be a safe, effective and simple method of reducing IOP in many eyes with primary angle closure and a patent iridotomy in which there is a sufficient extent of visible trabecular meshwork.

THE DIAGNOSTIC YIELD OF OPTIC NERVE ULTRASONOGRAPHY DIFFERENTIATING PAPILLEDEMA FROM PSEUDOPAPILLEDEMA IN EYES WITH SWOLLEN DISCS

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Introduction: Papilledema is a serious neurological condition. Pseudopapilledema is usually a benign condition. Distinguishing between pseudo and true papilledema often can be clinically difficult. The aim of this study was to investigate whether ultrasonography as non invasive technique, can contribute to distinguish between the two conditions.
Patients / Methods: Thirty two patients with clinically diagnosed swollen optic discs were our study group. All patients underwent complete neuro-ophthalmological evaluation and optic nerve ultrasonography (B mode & A mode) using a 7.5 MHz probe. Detailed long follow- up with final diagnosis was than documented including neuroimaging and lumbar puncture findings.
Results: 17 patients had a hypo reflective crescent or a circle around the parenchyma of the nerve in B scan with a widened optic nerve pattern in A mode. 15 patients demonstrated normal optic nerve diameter in A mode and B mode showed either normal optic nerve pattern or findings consistent with optic nerve head druzen.14/17 had normal neuroimaging, with increased intracranial hypertension and were diagnosed as pseudotumor cerebri. 12/15 patients had normal neuroimaging, Normal pressure in LP and no evidence of systemic pathology on long follow up, finally diagnosed as pseudopapilledema. In 26/32 (83%) of the cases the ultrasonographic findings were consistent with the clinical, LP and neuroimaging findings. Only 6/32(17%) of the cases were misdiagnosed by ultrasound.
Conclusions: We found that ultrasonography can serve as a simple, non- invasive tool that can distinguish between different causes of swollen discs.

COMPARISON OF RETINAL NERVE FIBER LAYER THICKNESS IN GLAUCOMATOUS AND NONARTERTIC ANTERIOR ISCHEMIC OPTIC NEUROPATHY

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Introduction: Our purpose was to evaluate the role and ability of optical coherence tomography (OCT) to detect differences in peripapillary retinal nerve fiber layer (RNFL) thickness between glaucomatous optic neuropathy and nonartertic anterior ischemic optic neuropathy (NAION).
Patients / Methods: This study included 18 eyes with NAION and 18 eyes with glaucoma (POAG). Eyes with myopia were excluded. Peripapillary RNFL thickness was measured with the OCT using the fast RNFL thickness protocol. The RNFL thickness parameters used for evaluation included average RNFL thickness and inferior, superior, nasal and temporal RNFL thickness. RNFL thickness parameters were compared between the NAION and glaucoma eyes.
Results: The average RNFL in NAION eyes was 66.2 +/- 39 microns and 49.3 +/- 21.9 microns in glaucoma eyes ($P < 0.001$). There was a significant difference in all RNFL thickness parameters between NAION and glaucoma eyes ($P < 0.001$). Superior and inferior RNFL thicknesses showed the biggest difference. The superior RNFL thickness in NAION and glaucoma was 72.3 +/- 50.7 and 51.3 +/- 22.6 microns, respectively. The inferior RNFL thickness in NAION and glaucoma was 88.1 +/- 49.4 and 56.8 +/- 30.8 microns, respectively.
Conclusions: RNFL thickness measured on OCT may serve as useful adjunct in accurately and more objectively distinguishing glaucomatous optic neuropathy from nonartertic anterior ischemic optic neuropathy (NAION). Average, superior and inferior RNFL thicknesses are among the most efficient parameters for distinguishing such a differentiation.

Retina

IRON METABOLISM ABNORMALITIES AND OXIDATIVE INJURY IN MOUSE MODELS OF RETINAL AND MACULAR DEGENERATION

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Introduction: We and others have previously demonstrated abnormal iron metabolism in retinal and macular degeneration, including increased levels of transferrin and ceruloplasmin mRNA, in retinas of rd10 mice (a model for retinal degeneration). The present study was aimed at gaining additional insight into the involvement of iron in these pathologies.
Patients / Methods: Rd10 mice and ccr2 knockout (KO) mice (model for age related macular degeneration) were studied. Expression pattern, in the retina, of transferrin receptor and ferritin were evaluated in rd10 mice, and transferrin, transferrin receptor, and ceruloplasmin were evaluated in ccr2 knockout mice. mRNA levels were measured using quantitative real time RT-PCR (QPCR) and protein expression was assessed by immunohistochemistry (IHC), or ELISA. Oxidative injury was evaluated by quantitative IHC for HNE (a product of lipid peroxidation).
Results: Retinal mRNA levels of transferrin were similar in ccr2 KO mice and controls at 7 months and 12 months of age, but was elevated at 16 months old ccr2 KO mice, concurrently with the appearance of drusen in this strain (1.2±0.4 vs. 0.8±0.1, p=0.05). mRNA levels of transferrin receptor and ceruloplasmin were similar in ccr2 KO mice, when compared with their controls, at all time points. Retinal mRNA levels of transferrin receptor were increased in 6 weeks old rd10 mice compared with controls (2.6±1.55 vs. 0.97±0.4, p=0.006). Ferritin (protein) levels were increased at 2 weeks (1.2±0.34 vs. 0.63±0.17, p=0.0002) and 3 weeks (1.8±0.7 vs. 1.2±0.4, p=0.03) of age in rd10 mice compared with controls. HNE levels were enhanced in rd10 mice compared with controls at 2 (134.4±14.7 in arbitrary units vs. 111.3±17.4, p=0.05), 3 (130.4±11.3 vs. 89.6±20.8, p=0.005) and 6 weeks of age (121.81±14 vs. 83.91±8, p=0.0008).
Conclusions: Altered expression patterns during the course of retinal degeneration in mice, were demonstrated. The altered expression is well correlated with oxidative injury of the retina. Combined with previous studies, the findings imply that iron associated oxidative injury may have a role in retinal and macular degeneration regardless of the primary insult.

MODULATION OF EPITHELIAL DIFFERENTIATION OF RETINAL PIGMENT EPITHELIAL CELLS THROUGH INHIBITION OF HISTONE DEACETYLASE ACTIVITY USING HYPERICIN

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Introduction: Epithelial cells differentiate into several specialized functions depending on the organs to which they belong. In the retinal pigment epithelium, genes involved in RPE activities such as formation of the outer blood-retinal barrier are expressed, including occludin, claudin and JAM-A. However, genes involved in tubule formation by epithelial cells are repressed, whereas in breast, endocrine and exocrine glands epithelial cells form the lining of ducts and genes that promote tubule formation are expressed. Although progress has been made with RPE transplantation to treat disruptions of RPE interactions with the neural retina, restoration of RPE-retinal interactions or re-establishment of the blood-retinal barrier remain unresolved and may require additional terminal differentiation events. Histone deacetylase (HDAC) inhibitors are enzymes which regulate epigenetic protein acetylation and have been shown to modulate differentiation in cancer cells
Patients / Methods: We aimed to examine the protein levels and modification of Hsp90 and occludin using Western Blot analyses upon cell treatment with hypericin, while F-actin evaluated using phalloidin staining. We also evaluated the growth pattern of RPE cells in response to cell treatment with hypericin.
Results: Here we show that hypericin is a compound that mimics HDAC6 inhibitors. Deacetylation of heat shock protein 90 in ARPE19 cells is inhibited by hypericin. As a result Hsp90 undergoes ubiquitination. Cytoskeletal F-actin distribution in RPE cells is modulated and occludin expression levels in the cells dramatically reduced. The typical growth pattern of RPE cells to form a homogeneous monolayer of cells with tight junctions between the cells is altered following treatment with hypericin. RPE cells grow in a unique pattern forming circles that mimic tubule forma
Conclusions: RPE cell treatment with hypericin modulates the differentiation properties of these cells in ways which mimic histone deacetylase inhibitors.

TRANSCONJUNCTIVAL SUTURELESS 23-GAUGE VITRECTOMY: IMPLEMENTATION AND RESULTS

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Introduction: The first transconjunctival sutureless vitrectomy system to be widely used was the 25-gauge system. Later, C. Eckardt developed, with DORC company, a 23-gauge transconjunctival sutureless vitrectomy system. The purpose of the study was to describe our initial experience with the 23-gauge transconjunctival vitrectomy system for vitreoretinal disorders.
Patients / Methods: We retrospectively studied a consecutive series of the first 50 eyes of 50 patients who underwent transconjunctival sutureless 23-gauge vitrectomy surgery. The indications for surgery were: - Idiopathic epiretinal membrane (38), full thickness macular hole (3), vitreo-macular traction (3), vitreous hemorrhage (3), tractional diabetic macular edema (2), and retinal detachment (1). In 4 eyes vitrectomy was combined with cataract surgery. All eyes underwent pre- and postoperative visual acuity testing with refraction, applanation tonometry, slit-lamp biomicroscopy examination including fundus examination. Special attention was given to reported per or post operative complications. All surgeons were familiar with 20 and 25-gauge vitrectomy before using the 23-gauge system. Their opinion was asked about the 23-gauge compared to 25-gauge technique.
Results: The series included 28 women and 22 men, median age: 73.5 yo [48-84]. Median follow-up was 13 weeks [1-31]. Median visual acuity improved during this time from 0.2 [0.01-0.6] pre op. to 0.5 [0.02-0.9] post op. No complications due to the 23-gauge system occurred in this series. In 2 cases a retinal tear was found during the surgery and treated by cryo. The advantages found of 23-gauge versus 25-gauge systems were: -Better and quicker vitrectomy: for a normal vitreous very similar to 20-gauge. -Brighter light: sectional surface of 23-gauge is about 50% larger than the 25-gauge surface. -Larger and sturdier instruments: less flexible than the corresponding 25-gauge instruments, with ends (forceps) almost identical to those of standard 20-gauge instruments. -Sclerotomies were always self-sealing: due to tangential incisions. The drawbacks found of 23-gauge versus 25-gauge systems were: Microcannulas must be positioned in 2 steps. More frequent subconjunctival bleedings.
Conclusions: The 23-gauge vitrectomy system seems safe for selected vitreo-retinal conditions. Our impression is that the 23-gauge system can be used for a larger spectrum of vitreo-retinal conditions than 25-gauge systems. It combines the advantages of transconjunctival sutureless vitrectomy with those of instruments with a larger diameter.

THE EFFECT OF ANGIOPOIETIN-1 ON VASCULAR PERMEABILITY AND RETINAL NEOVASCULARIZATION IN A RABBIT MODEL OF PROLIFERATIVE RETINOPATHY

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Introduction: Severe visual loss in diabetic retinopathy may occur due to ischemia induced proliferation of new vessels (PDR). VEGF is a primary mediator of vascular permeability and intraocular angiogenesis. In a previous report we have demonstrated induction of proliferative retinopathy by injecting autologous cells carrying the VEGF165 gene into the rabbit eye. Overexpression of Ang1 in the retina of transgenic mice causes suppression of retinal or choroidal NV and suppresses VEGF-induced vascular permeability. In the present report we have investigated the effect of Angiopoietin-1 expressed by autologous cells on VEGF165 induced vascular permeability and retinal neovascularization in a rabbit model.
Patients / Methods: Smooth muscle cells and endothelial cells were harvested from 5 rabbits from jugular vein segments. They were isolated and expended. Pseudo-typed retroviral-based vector was used to transfer the VEGF165 gene to the smooth muscle cells and the Ang-1 to the endothelial cells. The autologous cells carrying the VEGF165 transgene and the Ang-1 transgene were injected into the left vitreous cavity of 5 rabbits. The right eye was used as a control. Three rabbits were injected with 2.5 million smooth muscle cells carrying VEGF and 2.5 million endothelial cells carrying the Ang-1 transgene simultaneously and two were injected with the same dose but the VEGF carrying cells were injected 1 week prior to the Ang-1 cells. The rabbits were followed up for 5 weeks by fundus examination and by weekly fluorescein angiography and color photography. ERG was performed at baseline and immediately after injection. Intravitreal VEGF levels were measured at the end of the experiment. The eyes were then studied histologically.
Results: Over expression of Angiopoetin-1 using autologous cells reduced the amount of vascular permeability and new vessels formation when injected simultaneously with autologous cells carrying VEGF, but not when it was injected a week following VEGF cells injection.
Conclusions: Intra-ocular neovascularization can be induced by injecting intravitreally autologous smooth muscle cells carrying the VEGF165 transgene. Angiopoetin-1 may reduce the effect of VEGF, reduce vascular permeability and prevent ocular neovascularization. Ang-1 effect is significant when both genes are given simultaneously and insignificant when Ang-1 injection is given 1 week following VEGF injection.

EXPRESSION OF PRO-INFLAMMATORY CYTOKINES IN A MOUSE MODEL OF CENTRAL RETINAL ARTERY OCCLUSION

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Introduction: Central retinal artery occlusion (CRAO) is an ischemic event that may cause severe irreversible visual loss. Previously reported elevated inflammatory markers suggested the role of inflammation in the ischemic process of various organs, including the eye. The aim of this study was to measure the expression of pro-inflammatory cytokines in the retina, following induction of CRAO in a mouse model.
Patients / Methods: CRAO was induced in C57BL6 mice, using laser photoactivation of intravenously injected rose-bengal, over the central retinal artery. The right eye was treated and the left eye served as a control. The mice were euthanized, and the eyes enucleated for histologic evaluation and extraction of the retinae. The expression of interleukin (IL)-6, macrophage inflammatory protein (MIP)-2, and tumor necrosis factor (TNF)-α in the retina, was determined at 3, 6, 12 hours and 1, 7, and 21 days after CRAO induction, by real time-polymerase chain reaction on cDNA. Histopathologic evaluation was performed at each time point.
Results: Proinflammatory cytokines were hardly detected in the control eyes. Preliminary results showed that expression in the ischemic eyes varied with time. Three hours after induction of CRAO, relative expression of IL-6 was lower (0.46) in the retinal tissue of the ischemic eyes. At 12 hours, IL-6 levels showed a peak elevation, with a range of 16-30 folds of the control levels, and dropped again at 7 days. MIP-2 expression showed also an early decrease at 3 hours (0.58), peak expression at 12 hours (mean 19 folds), and significant decreased levels 7 days after induction of CRAO. TNF-α was hardly detected in both eyes. Three hours post ischemia the expression was lower in the ischemic eyes, with a trend of increased expression at 12 hours, while still low in the control eyes.
Conclusions: Pro-inflammatory cytokines are variably expressed in the retina after induction of CRAO in mice. These findings may suggest an inflammatory role in the pathogenesis of the ischemic damage to the retina. The reduction of IL-6 levels shortly after induction of ischemia and its rise 12 hours later may have a neuro-protective effect.

OPTOELECTRONIC RETINAL PROSTHESIS: SYSTEM DESIGN AND PERFORMANCE

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Introduction: Electronic retinal prostheses represent a potentially effective approach for restoring sight in blind patients suffering from retinal degeneration. The design of a high-resolution prosthesis presents many engineering and biological challenges. Small electrodes must inject enough charge to stimulate nerve cells, within electrochemically safe voltage limits. Stimulation sites should be placed close to the target cells to prevent “blurring” and minimize current. Signals must be delivered wirelessly to large number of electrodes, and visual information should, ideally, maintain its natural link to eye movements. Finally, a good system must have a wide range of stimulation currents, external control of image processing, and the option of either anodic-first or cathodic-first pulses.
Patients / Methods: Prototypes of the infrared projection system and radiofrequency power delivery system for retinal prosthesis have been developed. Optoelectronic performance of the system was evaluated in continuous and pulsed illumination modes using photovoltaic and photoconductive regimes of photodiodes. The electric field in front of an electrode array with local and distant returns was calculated numerically.
Results: Photodiode conversion efficiency was 0.3 A/W, providing stimulation currents of up to 20 μA with 0.5 ms pulses at 50 Hz, using on a 40 μm IrOx electrode. A 3 mm implant containing 640 pixels, each a square that is 100 μm in size, requires up to 45 mW of maximum peak power and ~0.4 mW of average light power, with ~1 mW average electrical power. Significant interference from neighboring electrodes was observed in arrays with remote return electrode, leading to decreased resolution and charge injection. This can be eliminated by introducing local returns; however, stronger confinement of electric field requires better proximity to the target cells. This can be achieved by using subretinal pillar electrodes.
Conclusions: A photodiode-array-based prosthesis that produces stimulation pulses controlled by local light intensity and enhanced by a pulsed bias can provide sufficient current and dynamic range for retinal stimulation, while remaining within safe electrochemical and thermal limits. Since visual information is processed externally and projected to all pixels simultaneously, the retinal prosthesis is compact, versatile, consumes low power, and maintains the natural link between image perception and eye movements.