Association for Research in Ophthalmology

Program for the Annual Meeting, May 1–2, 1967

Statler-Hilton Inn, Clearwater Beach, Fla.

Chairman, Board of Trustees, ***George K. Smelser,*** New York, N. Y.
Secretary-Treasurer, ***Herbert E. Kaufman,*** Gainesville, Fla.

Monday, May 1, 1967, 8:30 a.m. to 12:00 noon

Jules L. Baum and Eeva-Liisa Martola
The relationship between corneal edema and corneal vascularization

Patients with chronic corneal stromal edema extending to the limbus and showing no evidence of stromal vascularization were examined. Peripheral corneal thickness measurements immediately in front of the limbal blood vessels were performed with a Donaldson pachometer. It is suggested that a decrease in corneal tissue compactness, per se, is an insufficient stimulus for stromal vascularization.

Sterling M. Trenberth, Saiichi Mishima, and Lydia E. Valentin
The effect of ouabain on the corneal endothelium of the rabbit

The rate of corneal swelling at varying concentrations of ouabain was determined, when applied to the endothelial surface of the isolated in vitro cornea. The swelling-rate concentration relationship conformed to the previously described concentration inhibition effects on the Na-K ATPase system. Ouabain had virtually no effect on the permeability of the endothelium to ^{14}C-labeled nonelectrolytes and to the flow of water.

S. D. Klyce, Jr., and C. H. Dohlman
In vivo determination of corneal swelling pressure

A method for in vivo estimation of corneal swelling pressure was developed. Hydrogel membranes of glyceryl methacrylate were implanted intralamellarly in rabbit corneas and observed for months. Subsequent gel volume reduction was interpreted as a response to the normal corneal swelling pressure. Two methods were developed to correlate gel volume reduction in vivo with the swelling pressure of the hydrogel. The results indicate that the in vivo corneal stroma has a swelling pressure of 40 to 80 mm. Hg, which is equivalent to values previously obtained in vitro by other methods. From this finding, it is pointed out that an active dehydrating mechanism must be functioning in one or both of the limiting membranes to maintain the steady-state distribution of water between the tissue and the surrounding media.

Gordon I. Kaye and Saiichi Mishima
Effects of perfusion with Ca^{++}-free medium on the corneal mesothelium

Perfusion of corneas with a Ca^{++}-free medium according to the method of Mishima and Kudo leads to severe swelling within one hour. Under these conditions, mesothelial permeability to nonelectrolytes is increased to more than 150 per cent of normal and the terminal bars of the mesothelium disintegrate, resulting in a partial separation of the mesothelial cells at the anterior chamber surface.

Jay M. Enoch
Validation of an indicator of mammalian retinal receptor response: Recovery following exposure to a luminous stimulus

Dark-adapted albino rats were exposed to a luminous stimulus. Varying time periods in the dark were allowed following exposure before removing the eye from the living animal. The threshold retinal irradiance was measured for just detection of the latent retinal image revealed by

a histochemical technique. This experiment is somewhat analogous to dark adaptation.

Arthur M. Goldstein and Stella Y. Botelho

The effects of atropine and tolazoline upon lacrimal flow

Flow from a cannula in the excretory duct of the lacrimal gland was recorded in rabbits. Local intra-arterial injection of pilocarpine and norepinephrine produced changes in flow similar to those induced by intravenous administration. Pretreatment with atropine and tolazoline altered the flow responses to pilocarpine, norepinephrine, epinephrine, and isoproterenol.

Charles W. Nichols, David Jacobowitz, and Marianne Hottenstein

The influence of light and dark on the catecholamine content of the retina and choroid

The retina and choroid of light- and dark-adapted albino rats, guinea pigs, and rabbits was assayed for catecholamines by a spectrophotofluorometric method. In rats and rabbits, there was a significant increase in retinal dopamine and in guinea pigs and rabbits a significant increase in choroidal norepinephrine with light adaptation. This may be due to an influence of light on cathecholamine synthesis.

Richard Earl Goldberg, Wilbur J. McElroy, and Raymond A. Pilkerton

Ophthalmic applications of the Doppler transcutaneous flow indicator

The Doppler transcutaneous flow indicator is a new, efficient, and compact instrument to evaluate blood flow in the "ophthalmic arterial system."

Instrumentation, principles, and techniques are described, with emphasis on the evaluation of collateral circulation, relationships of intraocular pressure to blood flow, and studies of occlusive disease.

A simple three-step test is introduced to diagnose carotid insufficiency.

Angiography, ophthalmodynamometry, and tissue specimens corroborate Doppler studies.

Monday, May 1, 1967, 3:00 to 6:00 p.m.

Laszlo Z. Bito, Kelly Hyslop, and John Hyndman

Some "adaptive" alterations in the physiological and pharmacological behavior of the iris of the cholinesterase-inhibitor–treated mammalian eye

After a few days of cholinesterase-inhibitor treatment of the eye, the pupil returns to a relatively normal state of dilatation and it responds to normal light stimulus. The iris of these eyes, however, shows abnormal pharmacological reactions to parasympathomimetic drugs. These observations will be discussed in the light of mechanisms known to control normal movements of the mammalian iris.

Sheela Amrute and Morris Green

α-Glycerophosphate dehydrogenase activity in the rat lens

α-Glycerophosphate dehydrogenase (α-GPD) activity was studied in rat lens homogenates by following the rate of disappearance of DPNH. The enzyme is water soluble, varies linearly with lens concentration, and is inhibited by sulfydryl reagents and freezing. Lens α-GPD activity is higher in younger than in older animals. Lenses from rats on high galactose diets for 1 to 7 days do not show any significant change in enzyme activity.

B. W. Lambert and J. H. Kinoshita

The effect of ionizing radiation on the lens

Measurements of active transport and permeability were made on the lenses of irradiated rabbit eyes. One week after irradiation the rabbit lenses were found to have an increased permeability directly proportional to the ionizing dose as measured by rubidium-86 runout. Active transport in rabbit lenses showed no change as measured by rubidium-86 uptake.

F. T. Fraunfelder and R. P. Burns

The experimental acute reversible lens opacity: Drug-induced, cold, postmortem and dehydration cataracts

Many previously reported experimental cataracts can be prevented by closure of the animal's eyelids. These lens changes have many common characteristics for which we propose the classification "acute reversible lens opacity" (ARLO). Changes in humidity, temperature, various gas concentrations, and other modifying factors affecting this experimental model will be described.

M. I. Freeman, B. Jacobson, L. Z. J. Toth, and E. A. Balazs

Lysosomal enzymes associated with vitreous hyalocyte granules

By means of centrifugation techniques in conjunction with enzymatic digestion, the granules of calf vitreous hyalocytes were separated into nuclear, granular, mitochondrial-microsomal, and supernatant fractions. A structure-linked latency for lysosomal enzyme activities within the fractions was demonstrated. Composition and morphology of the fractions were confirmed by electron microscopy.

Terrance G. Cooper and David B. Meyer
The ontogeny of retinal oil droplets in staged chick embryos

Correlative data will be presented on the "time" of appearance of the colored oil droplets in the retinas of morphologically staged chick embryos as obtained by spectrophotometric analyses of chromatographically separated (thin-layer) carotenoids and microscopic examinations (phase and bright field) of fixed (Kolmer) and fresh, unfixed preparations.

Joel Pokorny, Vivianne Cameron Smith, and Ronald Pritchard
Artificial dichromacy produced by additive chromatic fields

The purpose of this study was to investigate the effects of an added highly saturated red light on luminosity, saturation, and wavelength discrimination functions of the normal observer.

Protanopic type responses were obtained which increased in severity as the luminance of the additive field was increased.

P. D. Mehta and H. Maisel
Subunit structure of bovine alpha crystallin and albuminoid

The subunit structure of purified bovine alpha crystallin and albuminoid was analyzed by starch gel electrophoresis in 7 molar urea. Albuminoid and alpha crystallin from adult lenses showed nearly identical subunit patterns. Major differences were noted between the subunit patterns of embryonic and adult bovine alpha crystallin. Species differences were noted between the subunit patterns of human, bovine, and chick alpha crystallin.

Awards banquet 7:00 p.m.

Friedenwald Award Winner, D. M. Maurice

Tuesday, May 2, 1967, 8:00 to 9:00 a.m.

Friedenwald lecture

D. M. Maurice
The use of fluorescein in ophthalmological research

Concurrent specialty seminars, 9:00 to 12:00 noon

Anatomy: Moderator, **Adolph I. Cohen,** Department of Ophthalmology, Washington University, St. Louis, Mo.

Johan Zwaan and Ikeda Akira
The appearance and subsequent distribution of delta-, alpha-, and beta-crystallin in the developing lens of the chicken

Antisera to isolated chicken crystallins were used for an immunofluorescence study of lens differentiation.

Delta-crystallin (FISC) appeared first in a few lens placode cells, which probably were in interphase. Gradually more cells became involved until at three days the complete lens was fluorescent. From eight days on the reaction in the epithelium became weaker until at five weeks after hatching it was completely negative. Fluorescence remained strong, however, in the lens nucleus. Delta-crystallin may thus be regarded as an embryonic protein, with a very slow turnover.

Alpha-crystallin was first seen in a few fibers at around three days. At eight days the epithelium became positive and the fibers lost some fluorescence until five weeks after hatching the lens core was completely negative. Alpha-crystallin, appearing relatively late in development, can therefore not be regarded as an essential protein for lens formation.

Beta-crystallin appeared slightly after delta-, and its further behavior resembled that of alpha-.

W. Lerche and K. G. Wulle
Electron microscopic studies on the development of the human lens

The fine structure of the developing human lens of 8, 11, and 20 mm. embryos has been studied. The observations include description of development of the lens capsule, of the formation and fine structure of the primary lens fibers, and particularly the cells of the area where the lens separated from the cornea. Here, the relationship of the mesenchyme cells between the corneal epithelium and the lens is well demonstrated. All of the electron micrographic observations will be correlated with the classical light microscopy of the early developing lens.

Maurice H. Bernstein
Effects of long-term dark adaptation: Retinal epithelium

The physiological parameters of dark adaptation are normally found to be complete in twenty to forty minutes. Fine-structure studies show a progressive depletion in secretory material of the retinal epithelium over a period of seven days. The process is readily reversible; exposure to light restores the normal functional state within minutes.

Kensei Cheng, Tetsuma Ozawa, and Anita Liebowitz
Ultrastructural changes in the extraocular muscles of rabbit after denervation

The fine structure of superior rectus muscles in rabbit was examined at intervals from 24 hours to 30 days after the intracranial section of the oculomotor nerve. As early as the third day follow-

ing the nerve section, various degenerative changes were observed in myelinated nerve fibers of the superior rectus and terminal axons at the neuromuscular junctions. Focal degenerations such as disintegration of Z lines and disorganization of myofibrils in some of the extraocular muscle fibers were detected within 14 days after the denervation.

John E. Dowling

Complex synapses in frog and pigeon retinas

The plexiform layers of the frog and pigeon retina have been studied by electron microscopy and the types and patterns of synaptic contacts recorded. The most striking feature of the frog and pigeon inner plexiform layer is the presence of numerous serial synapses in which one process is presynaptic to a second, which is presynaptic to a third, etc. Such complex synaptic arrangements will be discussed in relation to the physiology of these retinas.

Paul Henkind, Ferraz de Oliveira, and Linda Karasik

Development of the retinal vascular bed

Extensive study of the developing retinal vascular bed of the rat was carried out. Animals from one to six days old were used and their retinas treated by India inking, PAS staining, and retinal digestion techniques. The observations provide evidence that retinal vessels develop from a syncytial network of immature capillaries, and not from venules as previously postulated. Other features of the developing vasculature were also noted.

David M. Kozart

Regional morphologic differences of the ciliary epithelium in the adult albino rabbit: An electron microscopic study

The pigment and nonpigment ciliary epithelia in the adult albino rabbit manifest regional morphologic differences in the light and electron microscope. The pigment epithelium varies from a squamous to cuboidal configuration and the nonpigment epithelium from a cuboidal to columnar shape. Following one or more anterior chamber paracenteses both epithelial layers in the anterior corona ciliaris undergo marked changes, whereas neither epithelial layer in the posterior corona ciliaris or orbiculus ciliaris is altered.

Biochemistry: Moderator, Sidney Lerman, Strong Memorial Hospital, University of Rochester, Rochester, N. Y.

G. Winston Barber

Free amino acids in senile cataractous lenses, possible osmotic etiology

Based on chromatographic analysis of free amino acids in human senile cataracts, the hypothesis is proposed that accumulation of amino acids due to net hydrolysis of lens protein may be an early, perhaps initiating event in cataractogenesis. Resultant fluid imbibition, swelling, and disruption of structural regularity at both cellular and molecular levels may be the direct cause of lenticular opacification.

John F. R. Kuck, Jr.

The effect of aging on the sorbitol pathway in the rabbit lens

The levels of sorbitol pathway metabolites (glucose, sorbitol, and fructose) in rabbit lenses and the changes with age are similar to those in the rat. Since the rabbit lens is larger by a factor of ten, the difference in size is less important than metabolic factors or changes in permeability for controlling the levels of these metabolites.

Abraham Spector and Mark Zorn

Studies upon the sulfhydryl groups of calf lens alpha crystallin

Alpha crystallin, a macromolecule composed of approximately 50 subunits, contains one sulfhydryl group for each monomeric unit. However, a large fraction of these sulfhydryl groups are unavailable to para-hydroxymercuribenzoate at 20° and pH 7.0 because of the packing arrangement of the subunits in the aggregate. With increasing temperature, the sulfhydryl groups become exposed. Such sulfhydryl reactivity studies upon alpha crystallin isolated from the periphery and nucleus of the lens indicate that the macromolecule may exist in at least three stable aggregate forms. Sugar alcohols appear to cause transformations in the aggregate conformation. Glucose does not have a similar effect.

Lu Ku Li and Abraham Spector

Conformation studies upon calf lens alpha crystallin

One of the major structural proteins in the lens, alpha crystallin, has an average molecular weight (m.w.) of 1×10^6 and is composed of aggregates of units with a m.w. of 2×10^4. The circular dichroism (CD) and optical rotatory dispersion (ORD) of this macromolecule at neutral pH between 200 and 590 mμ are characteristic of the antiparallel beta conformation. Alpha crystallin deaggregates to a m.w. of approximately 7×10^4 at pH 11.7. The corresponding CD and ORD indicate the disappearance of the beta form, the presence of random structure, as well as a

5 to 10 per cent contribution from alpha helix. When the pH is returned to 8.0, certain irreversible changes can be noted in the ORD and CD spectra, but the over-all spectra characteristic of beta structure reappears.

Tibor G. Farkas

Effect of insulin on the glucose transport and glucose utilization of isolated rat lenses

The effect of insulin administration on the glucose utilization and glucose uptake of the lenses of chromium-treated animals has been studied. The effect of the hormone on these two aspects of glucose metabolism will be discussed in light of the current theories of insulin action.

Sidney Lerman, W. F. Forbes, and Seymour Zigman

Further studies on a cryoprotein in the ocular lens

The hyperchromicity observed in gamma crystallin derived from dogfish and rat lenses has been investigated by means of electronic absorption studies and ionization behavior. These studies indicate that the hyperchromicity is due to the tyrosine residues within gamma crystallin and hypothesis is proposed in which a close packing of some of these tyrosyl residues permits a special type of electronic interaction resulting in an unusually high molar absorptivity. Six-hour tryptic digests of gamma crystallin reveal that tyrosine is present in only three or four of the 24 peptides obtained by this procedure. These data and tritium-hydrogen-exchange data are consistent with the foregoing hypothesis.

Sidney Futterman and Paul E. Bishop

Vitamin A aldehyde reduction in visual cell outer segment preparations

Bovine visual cell outer segments sedimented by differential centrifugation of homogenates and washed twice to remove contaminating particulate fractions are isolated as an organelle to which fragments of the mitochondria-containing ellipsoid region of the cell remain firmly attached. In these preparations the glycolytic, tricarboxylic acid, and hexose monophosphate oxidation pathways are active and are capable of supplying reduced pyridine nucleotides for the enzymatic reduction of vitamin A aldehyde to vitamin A which occurs during light adaption.

Jin H. Kinoshita and L. O. Merola

Effect of urea on retinal ATPases

We studied the effects of various concentrations of urea ontwo types of ATPases in rod outer segments. At very high concentrations of urea both activities are lost. However, storage of the enzyme preparation in intermediate levels of urea causes a preferential loss in Mg-ATPase without appreciably affecting the activity of the Na-K, Mg-ATPase.

Bernard Jacobson

Studies on hyaluronic acid synthesis in calf vitreous hyalocytes

A soluble enzyme prepared by high-speed centrifugation of extracts of calf vitreous hyalocytes catalyzes the transfer of radioactivity from either ^{14}C-UDPGA or ^{14}C-UDPAG into hyaluronic acid oligosaccharide or higher molecular weight acceptor. The enzyme is believed to possess a positively charged group necessary for enzyme action since acetylation by N-acetyl imidazole inhibits activity.

Immunology: Moderator, A. M. Silverstein, Wilmer Ophthalmological Institute, The Johns Hopkins University, Baltimore, Md.

M. H. Flax, J. H. Elliott, and J. J. Daly

The corneal reaction in delayed hypersensitivity

The present study consists of a morphologic examination of the limbal cellular infiltrate associated with classic delayed hypersensitivity reactions of the cornea.

The gross corneal reaction, comparative sensitivity of skin and corneal reactions, and the histology of the limbal cellular infiltrate of this reaction will be described.

D. W. C. Lorenzetti and H. E. Kaufman

Quantitative steroid effect on graft reaction

Previous work has established the effectiveness of topical corticosteroids in the suppression of graft reactions in our experimental model.

The present experiments were carried out to determine what dilutions of corticosteroids would still be effective in preventing corneal graft reactions and whether the experimental model could serve quantitatively for anti-inflammatory drug assay.

H. L. Cromroy, D. R. Morrison, and J. A. Capella

The use of beta radiation as a local immunosuppressant in corneal transplants

Heterologous, interlamellar corneal transplants have been used to produce a unique, localized immunological response. Extensive experimentation has been carried out in an attempt to suppress this immune reaction by various clinically

acceptable inhibitors. The successful inhibition of the reaction by topical application of corticosteroids has prompted the use of beta radiation as a potential immunosuppressant.

Sequential surface doses of 5,000 and 10,000 roentgen equivalent beta radiation were administered from a specially constructed ^{90}Sr ophthalmic applicator to implanted corneas at various times after transplantation. The experimental animals were Dutch pigmented female rabbits with pig cornea serving as the heterologous donor. The inhibition of clinically observable characteristics and correlated cellular changes are evaluated as to their importance in the development of the immunologic response. In contrast to the previous reports that the immune reaction is mediated by systemically produced antibodies, the experiments suggest that the entire response is cellularly mediated.

A. A. Khodadoust and A. M. Silverstein

Survival and rejection of donor epithelium in corneal homografts

Previous reports suggested that the donor epithelium is invariably lost from corneal homografts during the immediate postoperative period. Three different approaches including daily staining of the transplant site and radioactive labeling of donor cells demonstrated that, in lamellar keratoplasty in the rabbit, donor epithelium may survive for many months. It was also observed that specific rejection of donor epithelium may take place under certain conditions either with or without active rejection of the donor stroma.

D. E. Eifrig and R. A. Prendergast

Anterior chamber lymph node implantation; local adoptive immune response in the eye

Specifically sensitized autologous lymph node tissue was implanted into the anterior chambers of rabbits. The response to local and systemic injection of homologous antigen was studied. Specific challenge resulted in a marked cellular response within the implanted lymphoid tissue, as well as in a significant anterior uveitis.

Katsuzo Segawa and George K. Smelser

Electron microscopy of experimental uveitis: A mononuclear cell response in the uveal tissue induced by a single intravitreal injection of antigen

The fine structural changes occurring in uveitis caused by a single intravitreal injection of bovine serum albumin were studied. The earliest region of cellular infiltration was the base of the ciliary body. Slightly later, considerable infiltration was found in the root of the iris, the pars plana, and the peripheral choroid. The cellular response in this type of inflammation is mainly one of mononuclear cells. Study of their fine structure revealed that they consist of histiocytes, many monocytes obviously derived from the circulating blood, and a series of cells which appear to be intermediate between lymphocytes and plasma cells. Some are of the type which have been described as immunoblasts and, of course, mature plasma cells. Intercytoplasmic connections were found between monocytes and lymphocytes or blast cells on several occasions.

The cells described were seen at various stages leaving the blood vessels and entering the connective tissue spaces. They penetrated between the epithelial cells of the ciliary processes without, however, causing discernible alteration in their fine structure. At this stage little or no damage to any ocular cells was seen.

Waldon B. Wacker and Murray M. Lipton

Experimental allergic uveitis. The role of retinal antigens and adjuvant in production of immune response and ocular disease

A single injection of guinea pigs with homologous retina emulsified in Freund's adjuvant resulted in ocular immunopathology, humoral antibody, and hypersensitivity. The humoral responses were elicited by two retinal specific antigens, only one of which was functional in inducing immunopathology and hypersensitivity. Immunogenic titrations indicated quantitatively optimal and critical relationships between retinal antigen and the mycobacterial portion of the adjuvant in eliciting these phenomena.

J. Genis-Galvez and H. Maisel

The ontogeny of chick lens proteins

The ontogeny of chick lens proteins was analyzed by immunologic and electrophoretic methods. Determinations were made on animals of different ages, and on the whole lens, as well as different parts of the lens. The studies show significant quantitative and qualitative changes in lens protein distribution associated with increasing age of the lens.

Visual electrophysiology: Moderator, W. W. Dawson, Department of Ophthalmology, University of Florida, Gainesville, Fla.

R. E. Carr and H. Ripps

Rhodopsin kinetics and rod adaptation in Oguchi's disease

The extremely slow rate of dark adaptation observed in Oguchi's disease is usually attributed

to an abnormality affecting the regeneration rate of rhodopsin. The results of this study, however, show that rhodopsin kinetics are entirely normal in this disorder, but that the visual anomaly probably results from a defect involving neural processes within the retina.

Nathan W. Perry, Jr., Donald G. Childers, William W. Dawson, and H. Lee Stewart

Frequency analysis of photopic and scotopic components of the occipital evoked potential

Evoked potentials of 15 subjects were recorded under conditions where the rate of stimulation, the retinal area stimulated, and the adaptation of the eye were separately varied. An analysis of frequency components of the potentials revealed that the optimal scotopic potential was obtained at 1 per second stimulation.

Takashi A. Suzuki, Yoshiji Masuda, and Jerry H. Jacobson

Effects of light adaptation upon cortical photic evoked response in cat

The cortical electrical response of the cat evoked by light stimulation in light adaptation contains elements not found in dark adaptation. Bilateral, ipsilateral, and contralateral stimulation and light-adaptation studies indicated that the discharge occurs only when the photic stimulus and adapting light were presented to the same eye. The light adapted discharges were grossly affected by Nembutal administration.

W. W. Dawson, H. L. Stewart, and D. G. Childers

High-frequency activity in visually evoked responses of man

Reports on visually evoked responses from scalp electrodes have discussed only low frequency (LVER; ~ 0.1 to 20 Hz) waves. Action potentials are excluded normally by limitations of the processing equipment. Integration of the high frequency signals (HVER) in the pass-band of action potentials in a mean square amplifier over a time constant allows processing by standard computer-averaging techniques. Wide-band raw signals which are the basis of both HVER and LVER were processed and the results are compared.

P. A. Liebman, R. Rice, S. Carroll, G. Entine, and A. Laties

Triggers for C wave and pigment migration

A physiologic function for a pigment epithelial organelle, the myeloid body, is sought. Microspectrophotometry shows myeloid bodies to contain rhodopsin. We suppose they might serve as photoreceptor for triggering light sensitive pigment epithelial functions. Action spectra for ERG C wave and pigment migration were determined and found to rule out myeloid body triggering. Rather, C wave and pigment migration are shown to be triggered through light absorbed in both rods and cones.

H. L. Stewart and W. W. Dawson

Oscillatory potentials in man and animals

The ERG is thought to be a composite wave form. Until recently "A" and "B" components have received attention clinically. A few studies relate high-frequency subcomponents to visual defects. Their exploration in man and animals via application of in-line electronic data analysis provided insight into their origin and characteristics.

D. I. Hamasaki

ERG recordings from the intact, anesthetized octopus

The light-adapted ERGs of the octopus consisted of a negative wave at on and a positive wave at off. Superimposed on this response were fast oscillations (50 to 100 c.p.s.) whose latency and frequency depended on the stimulus intensity. After one hour of dark adaptation, there was an increase in sensitivity of 3.5 log units. A small positive wave appeared in the trough of the negative wave in the dark-adapted ERGs.

Paul Witkovsky

Spectral sensitivity of carp electroretinogram components

Electroretinograms (ERG) were elicited from intact, anesthetized fish. The dark-adapted ERG consisted of a B wave whose spectral sensitivity followed the rod pigment absorption curve. Slight light-adaptation revealed a C wave with the same spectral sensitivity. Under photopic conditions, blue, green, red, and far-red subpeaks were revealed by selective adaptation, increment threshold, and flicker techniques.

Tuesday, May 2, 1967, 3:00 to 6:00 p.m.

Moderators' summary of specialty seminars

David L. Knox and Anthony J. Bron

Ocular pressure abnormalities in patients with carotid occlusive disease

Applanation tonometry, electronic indentation tonometry with electronic recording, ophthalmodynamometry, brachial blood pressure determination, and arteriography pre- and postendarterectomy were performed in a study group of patients.

Occlusive vascular disease was associated with a prolonged initial pressure fall with indentation tonometric techniques, discrepancy between applanation and indentation pressures (low ocular rigidity), and low ocular pulse pressures as related to systemic blood pressure. These abnormalities reverted after endarterectomy.

The examination techniques will be described and variations suitable for office practice or cerebrovascular disease diagnostic and treatment centers defined.

Mansour F. Armaly

The heritable nature of ocular pressure

Three independent studies involving 1,654 pairs of genetically related individuals (parents-offspring-siblings) confirmed separately and jointly the hypothesis that ocular pressure level as measured by applanation tonometry is inherited and genetically determined. They confirmed in addition the hypothesis that ocular pressure is a quantitatively inherited trait determined by polygenic multifactorial inheritance.

Bernard Becker

Ascorbate transport in rabbit and guinea pig eyes

Ascorbate is secreted into the aqueous humor of guinea pig and rabbit posterior chambers. By raising the plasma ascorbate level, saturation kinetics can be demonstrated. Excised ciliary body–iris preparations accumulate ^{14}C-labelled ascorbate. The concentrating mechanism requires sodium, potassium, and calcium ions in the media. It demonstrates saturation kinetics with increasing ascorbate concentration, and is inhibited by ouabain and competitively by D-isoascorbate.

R. L. Katz and K. E. Eakins

The action of succinylcholine and decamethonium on the intraocular pressure of the cat

The effects of succinylcholine and decamethonium on intraocular pressure and extraocular muscle tension have been determined in the cat anesthetized with pentobarbital. Studies of the pressure/muscle tension dose-responses, the effect of curare, and acute and chronic section of all six extraocular muscles indicate that the rise in intraocular pressure produced by succinylcholine and decamethonium cannot be fully explained in terms of changes in extraocular muscle tension.

Morton B. Waitzman and Wendell D. Woods

Sodium movement in excised ciliary process tissue

Sodium transport has been studied in vitro with excised ciliary process tissue from albino rabbits. Sodium concentration of the medium decreased in the absence of potassium or in the presence of 1×10^{-4}M ouabain. Cyclic 3′,5′-AMP (endogenous biosynthesis of which has been observed) caused an increased net uptake of sodium by ciliary process.

E. A. Zeller, D. Shoch, S. G. Cooperman, and R. I. Schnipper

On the role of monoamine oxidase (EC 1.4.3.4) in the regulation of aqueous humor dynamics of the rabbit eye

To block monoamine oxidase (MAO) in tissues surrounding the anterior chamber, we instilled the powerful MAO inhibitor pargyline ($pI_{50} > 7$) into the rabbit eye. As early as 4 hours after instillation, there was a significant depression of secretion and, after 24 hours, of ocular tension, while no significant differences in outflow facility and pupil size appeared.

P. F. Lee and R. H. Donovan

Norethynodrel with Mestronal and intraocular pressure in rabbit eye

The influence of Norethynodrel with Mestronal on intraocular pressure and ocular tissues in the eyes of normal and glaucoma rabbits was investigated. Results obtained will be presented and discussed.