

MAILBOX

Increased lens dipeptidase activity in aging and cataract

EDITOR.—A new protease enzyme in the human lens, dipeptidase, has been purified to homogeneity and characterised recently by Sulochana *et al.*¹ This enzyme is specific for dipeptides in its protease function while two other lens proteases, leucine amino peptidase² and amino peptidase III,³ can act on di-, tri-, and oligopeptides. It is reported that the activity of amino peptidase III did not change with age but the specific activity decreased in human cataract lenses.⁴ Two viewpoints on the role of such proteases have been discussed by earlier workers—namely, a decline in the proteolytic enzymes with age leading to an accumulation of degraded proteins⁵ and an excessive proteolysis destroying essential structural proteins.⁶ A study was carried out to find the activity and specific activity of dipeptidase in cataract and aged lenses. The enzyme activity was measured using Leu-Try as substrate by following the procedure described earlier.¹ Lenses from human donor eyeballs and the operation theatre of Sankara Nethralaya, Vision Research Foundation were used for the analysis.

Activity and specific activity of human lens dipeptidase (normal and cataract) were compared with different age groups and are given in Tables 1 and 2. Though the activity tends to increase with age in the donor eyeball group, the increase is not statistically significant. There is not much difference in the activity among various age groups studied in cataract lenses. However, the specific activity in non-cataract lenses of donor eye in the age group 31-40 is only 0.159 unit/mg protein but that of cataract lens is almost double, at 0.33. Likewise, there is also a statistically significant increase in the specific activity in the cataract group compared with normal in the age groups 41-50 and 51-60.

The specific activity of an enzyme is a better index for assessment of enzyme function than the activity. This increase in specific activity was not only related to aging but also to cataract. Increased specific activity indicates that the dipeptidase enzyme may be a vital protein. Though many other lens proteins undergo either denaturation or precipitation, this enzyme remains viable and, in this context, it is of interest to note that the specific activities of exopeptidases are increased in cataract lenses.⁶ The specific activity of dipeptidase for three age groups 31-40, 41-50, and 51-60, has increased for cataractous lenses compared with that of donor eyeball. The differences are statistically significant. This clearly indicates that the specific activity increases with cataractogenesis. It is also interesting to note that even among the donor eyes, the specific activity 0.159, for the age group 31-40, increased progressively in age groups 41-50, 51-60, and 61-70, and is 0.413 for the age group 71-80 suggesting its role in advancing age.

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1 Sulochana KN, Ramakrishnan S, Arunagiri K. Purification and characterization of a new

Table 1 Activity of dipeptidase in human donor eyeball lenses (values are mean (SE))

Age group (years)	Mean age	No of cases	Sex	Mean total activity (units/lens)	Mean specific activity (units/mg protein)
31-40	35.3	3	1M 2 F	11.65 (2.6)	0.159 (0.055)
41-50	45.4	5	2M 3F	13.62 (1.88)	0.185 (0.028)
51-60	55.7	3	1M 2F	15.1 (3.43)	0.233 (0.041)
61-70	67.7	8	4M 4F	16.52 (1.61)	0.436 (0.064)
71-80	76.5	4	3M 1F	14.525 (2.94)	0.413 (0.092)

p Values on specific activities between 31-40 and 61-70 <0.02; 41-50 and 61-70 <0.005; 51-60 and 61-70 <0.05.

Table 2 Activity of dipeptidase in human cataract lenses (values are mean (SE))

Age group (years)	Mean age	No of cases	Sex	Mean total activity (units/lens)	Mean specific activity (units/mg protein)
31-40	37.6	3	3M	13.4 (0.86)	0.33 (0.033)
41-50	45.2	4	2M 2F	11.8 (1.74)	0.385 (0.075)
51-60	54.7	9	7M 2F	12.07 (1.51)	0.418 (0.055)
61-70	66.3	10	5M 5F	12.31 (1.26)	0.463 (0.058)
71-80	77.2	4	3M 1F	12.55 (2.67)	0.421 (0.047)

p Values on specific activities of dipeptidase between donor lens (Table 1) and cataract lens (Table 2) 31-40 <0.01; 41-50 <0.05; 51-60 <0.1; 61-70 and 71-80 not significant.

- enzyme dipeptidase from human lens. *Exp Eye Res* 1996;62:221-9.
- Hanson H, Frohne M. Crystalline leucine amino peptidase from lens. *Methods Enzymol* 1976;45:506-21.
 - Sharma KK, Ortwerth BJ. Isolation and characterization of a new amino peptidase from bovine lens. *J Biol Chem* 1986;261:295-301.
 - Sharma KK, Ortwerth BJ. Amino peptidase activity in normal and cataractous lenses. *Curr Eye Res* 1986;5:373-80.
 - Taylor A, Surgenor T, Thomson DKR, *et al.* Comparison of leucine amino peptidase from human lenses, beef lens and kidney and hog lens and kidney. *Exp Eye Res* 1984;38:217-29.
 - Swanson AA, Davis RM, Jackson BA, *et al.* Lens exopeptidases. *Exp Eye Res* 1981;32:163-73.

disjointed, with some chapters dealing exclusively with basic immunology and others attempting to describe basic immunology in the context of cicatrising diseases in general and of the conjunctiva in particular.

The layout of the book, its illustrations, and its compactness make for easy and refreshing reading and help to rearrange one's thoughts and refocus one's approach to dealing with the problem of cicatrising conjunctivitis.

HARMINDER S DUA

Excimer Laser Surgery for Corneal Disorders. By Peter S Hersh, Michael D Wagoner. Pp 161, DM198, \$79. New York: Thieme, 1998. ISBN 3-13-107961-4.

Potentially there is a great need for a good book with illustrations on the subject of phototherapeutic keratectomy for corneal disorders. Much has been written on the use of excimer laser for refractive surgery but much less has been written on it for therapeutic reasons. Yet this has been an important area for laser and with many indications and has provided significant benefit for patients reducing the need for both superficial and full thickness corneal grafting.

The authors set out in this book to try to address these issues. It is made up of seven chapters. Firstly, there is an introduction to excimer laser technology, followed by case selection and surgical decision making, then they outline techniques of excimer laser with clinical results and complications. They then provide refractive and topographic complications and considerations and, finally, the last chapter deals with phototherapeutic keratectomy for complications of excimer laser refractive surgery.

When writing a book there are probably two main audiences. First of all, the book is written purely for those who have a large grasp of the subject and who are subspecialists in the area and a book in that regard would tend to be written in much more detail and in a less simplistic fashion and will assume that the specialist will have an advanced understanding. Then, there is the book written for the average ophthalmologist, those who do not have this advanced or specialised knowledge or technique, but practise in the subject. This is a book clearly written for those with advanced knowledge of the subject and, while it has good intentions and the chapter headings are well chosen, it is a difficult book

BOOK REVIEWS

Developments in Ophthalmology. Vol 28. Cicatrising Conjunctivitis. Eds W Bernauer, J K G Dart, M J Elder. Pp 266. DM 341, \$248. Basle: Karger, 1997. ISBN 3-8055-6443-0.

This book deals with a very difficult area of ocular anterior segment pathology. The diverse aetiology; the frustrating clinical problem, both for the patient and the ophthalmologist; the complex management issues impinging on several subspecialties within ophthalmology and beyond, make it as much of a challenge to write about as it is to deal with. The editors, drawing on their own expertise and that of 20 other contributors, have indeed met this challenge amicably and put together a clinically useful and practical guide that will meet the needs of both the general ophthalmologists dealing with the occasional patient, and the subspecialist providing a specialist service for patients with cicatrising conjunctivitis. It begins by a succinct introduction to the subject, then describes several important clinical entities, and goes on to lay down a clinically useful approach that one may adopt towards evaluating, documenting, and managing these conditions and their sequelae. The synthesis of clinical aspects with pathology and basic science is maintained throughout, making it easy to understand the problem and rationalise its treatment.

The section dealing with aetiology and pathogenesis will be of interest to the researcher. The clinician may find it somewhat

to read as it is written in a rather confused fashion and mainly with the assumption that the readers have an in-depth knowledge of the use of laser in corneal disorders. This, in my view, is a pity because this book is extremely well illustrated with superb photographs of various corneal disorders. It also has exceptional illustrations and is well referenced. It deals with the whole subject in 161 pages, which is very reasonable, and this in itself should encourage laser surgeons to buy and read it. However, the average laser surgeon will be very disappointed and, in my view, will find this book rather difficult to follow as it is poorly written in terms of simplicity. Perhaps the more advanced laser surgeon will find this book more readable and more valuable.

MICHAEL O'KEEFE

Atlas of the Peripheral Ocular Fundus. 2nd ed. By William L Jones. Pp 328, £75. Oxford: Butterworth-Heinemann, 1998. ISBN 0-7506-9050 X.

This book fills a niche in ophthalmology texts and is a welcome addition. The introductory sections describe the techniques of examination and the spectrum of normal appearances. This is well laid out and, with many of the illustrations being photographs taken through the indirect ophthalmoscope, the reader is well prepared for examining patients. The first main section is on developmental abnormalities and it is noteworthy that the author thought it appropriate that this section should occupy more than one third of the book. Many referrals, both to ophthalmologists from optometrists and to retinal specialists, are as a result of this type of pathology and this text explains and illustrates the problems well. The section on vitreous degeneration and its relation to retinal disease is particularly well written, alluding to the most recent concepts in the role of changes in the vitreous and their effects on the retina. The different types and extents of vitreous detachment together with their symptoms and the implications are discussed well, as is the section on the role of trauma. In the chapter on retinal breaks the overall tenor is perfectly sound but I would perhaps take issue with the lack of differentiating between a retinal dialysis and a giant retinal tear since the vitreous structure and configuration are completely different, as is the prognosis, and I feel that this should have been emphasised much more.

The chapters on the management of retinal detachment are, to my mind however, a little disappointing in relation to the rest of the book. The description of the factors normally responsible for the retina remaining attached is excellent but the descriptions of the techniques and rationale of surgery are somewhat inflexible. This book does not purport to be a textbook of retinal detachment surgery and it seems inappropriate to discuss the finer points of scleral buckling, particularly when there is controversy as to whether vitrectomy or scleral buckling should be the primary procedure. It does, however, give readers who may not themselves perform retinal surgery an idea of the techniques involved and the results obtainable.

The book is written in a very readable style and is extremely well researched with comprehensive references in all chapters. The illustrations and diagrams are plentiful and helpful and the only slight criticism I might offer here would be the number of ultrasound pictures since, unless the reader is familiar with these,

and in particular the dynamic features which they can demonstrate in real time scanning, they may be difficult to interpret.

Overall, this is a well worthwhile book which would be of benefit to ophthalmologists and optometrists, and particularly those in training, with the bibliography being an excellent guide to further reading.

TOM BARRIE

Clinical Optics and Refraction. Ed by O J Lehmann, D H Verity, A G A Coombes, F G Ah-Fat, P J Francis, A C W Ionides. Pp 160, £19.99. Oxford: Butterworth-Heinemann, 1998. ISBN 0-7506-2188-5.

This book is aimed at the ophthalmologist, orthoptist, or optometrist, especially in their student or trainee days. It has an unaccustomed layout: each chapter is divided into (approximately) page sized chunks, with each page headed with a question asking which of the five statements about "topic X" is/are correct. There are then a few paragraphs summarising the topic, and at the bottom of the page are listed the answers as to whether the statements were true or false. The use of questions promises well as a learning tool, providing the well known pitfalls can be avoided: the statements must be well chosen to tap into the essentials of the subject rather than irrelevant trivia (measuring the critical angle of urine is a little obscure), ludicrous false statements must be avoided ("heterochromatic dimness matching" seems unlikely), the answers should actually be found by careful reading of the paragraphs, and (most importantly) all the answers must be correct. In general, the authors achieve this aim: there are a few notable exceptions, such as keratoconus being given as an example of index myopia. There are a few other occasions where the text itself contains mistakes: prismatic displacement is said to be greater for an object close to the lens. Any mathematical formulas relevant to the topic are presented (without derivation) in notes at the bottom of the page: these are obviously not considered particularly important—units of measurement are not always specified or are non-SI, the Cartesian sign convention attracts only cursory mention, and it was surprising to see u and v for object and image distance, rather than l and l' . None the less, the format works particularly well in a more applied topic: the discussion on aphakia can change quickly from aniseikonia to IOL calculations to contact lenses and their complications, all within a few pages. The book does not work so well as a primary source from which to begin to study a topic. Firstly, it does not have an index, and the chapter headings are broad and uninformative: it is not immediately obvious that "genetics of colour vision" will be in the chapter on refraction by the eye, or "blind registration" in clinical applications of optics; and "crowding phenomenon" is dealt under the heading "Ametropia" as well as "Strabismus". The latter is a good example of where the lack of cross referencing is detrimental: another is the case of antireflection coatings mentioned in two separate "questions" in Chapter 1 and again in Chapter 2. This independent topic by topic treatment leads to repetition in the section on lasers: a summary table could have presented comparative data well. In other cases, tables are used to good effect, to summarise Purkinje image characteristics, for example. There is only one diagram in the book, and this is regrettable, particularly in sections relating to

geometrical optics. Creating a word picture of the optics of retinoscopy is a challenging task, and the use of a logarithmic wavelength scale could elegantly convey the electromagnetic spectrum. The authors are to be congratulated on condensing a vast amount of information into a small space, and for dividing it conveniently into digestible chunks. It is a good book to read through before going into an exam, being a general refresher across a wide and varied syllabus. But to select specific topics and study them in depth, an alternative source will be needed.

CHRISTINE DICKINSON

Lasers in Facial Aesthetic and Reconstructive Surgery. Ed Brian S Biesman. Pp 124, \$120. Philadelphia: Lippincott Williams and Wilkins, 1998. ISBN 0-683-30414-3.

This text has a significant span of excellent contributors who bring a substantial amount of experience to this textbook, then encompass all the relevant specialties one could expect in oculoplastic surgery and orbital surgery.

Despite the array of talent and the glowing foreword from Richard Gregory, there appears to have been a distinct budget limitation on the production of this text. Therefore, the goals of the book which were to provide a guide that will be useful to students, residents, and practising physicians, only perhaps meets the criteria for the first two groups. It does seem to give an overview that is credible but, at times, appears to be more of an advertisement for the company Coherent Medical who have supplied many of the figures within the text, particularly technical specifications. This support from Coherent Medical is acknowledged in the text but, by definition, detracts from the independence of the overall production. Where there has been finance for technical details the budget appears to have varied quite significantly throughout the textbook on clinical matters. The first three chapters are relatively well illustrated with the exception of the final illustrations in chapter 2 which come as a surprise considering the expressed intent for quality. Chapter 3 is excellent with colour histology slides and complementary line diagrams that illustrate every point made in the text. The remaining chapters fluctuate in their intensity but are consistent in their brevity. Every point illustrated in colour emphasises the loss when black and white or line diagrams are used elsewhere in the text.

The brevity of some of the surgical descriptions for either incisional surgery or resurfacing would, I think, have been complemented by more illustrations. However, only line diagrams of some of the surgical theory are evident.

The benefit to the profession or any interested party will eventually be dictated by the price. The main author has compiled a fairly concise review of the scope of laser surgery and the majority of the theory applicable to this modality. Therefore, all the facts are present and the chapters are well referenced.

The book is heavily subsidised by Coherent Medical and therefore illustrations continually remind us of this fact. The student and the resident are allowed a brief overview of the practising position but may wish for more detailed theory and instruction from other text.

EWAN G KEMP

NOTICES

Ageing and the eye

The latest issue of *Community Eye Health* (no 29) discusses ageing and the eye. Included are papers on ageing and the eye from a global perspective; epidemiology; delivery of eye care to the elderly; and age related macular disease. For further information please contact *Community Eye Health*, International Centre for Eye Health, Institute of Ophthalmology, 11-43 Bath Street, London EC1V 9EL. (Tel: (+44) 171 608 6909/6910/6923; fax: (+44) 171 250 3207; email: eyesource@ucl.ac.uk) Annual subscription £25. Free to workers in developing countries.

Residents' Foreign Exchange Programme

Any resident interested in spending a period of up to one month in departments of ophthalmology in the Netherlands, Finland, Ireland, Germany, Denmark, France, Austria, or Portugal should apply to: Mr Robert Acheson, Secretary of the Foreign Exchange Committee, European Board of Ophthalmology, Institute of Ophthalmology, University College Dublin, 60 Eccles Street, Dublin 7, Ireland.

British Ophthalmic Photographic Association

The British Ophthalmic Photographic Association (BOPA) will hold a workshop entitled "The other side of the chin rest" on 10 July 1999 at the Southampton Eye Unit. Topics include: consent; allergies and complications; living with visual impairment; and procedures. Cost £20. Further details: Tim Mole (tel: 01703 798747).

Vision '99: International Conference on Low Vision and Vision Rehabilitation

The International Conference on Low Vision and Vision Rehabilitation will be held on 12-16 July 1999 at the Waldorf-Astoria Hotel,

New York City, New York. Further details: Lighthouse International, 111 East 59th Street, New York, NY 10022-1202, USA (tel: (212) 821-9482; fax: (212) 821-9705; email: vision99@lighthouse.org).

4th Meeting of the European Neuro-Ophthalmology Society

The 4th meeting of the European Neuro-Ophthalmology Society will be held on 29 August-2 September 1999 in Jerusalem, Israel. Further details: Secretariat, 4th Meeting of the European Neuro-Ophthalmology Society, PO Box 50006, Tel Aviv, 61500, Israel (tel: 972-3-514000; fax: 972-3-5175674/972-3-5140077; email: Eunoss99@kenes.com).

International Agency for the Prevention of Blindness

The sixth general assembly of the International Agency for the Prevention of Blindness will be held on 5-6 September 1999 at the Conference Centre, Beijing Friendship Hotel, Beijing, People's Republic of China. The theme is "The right to sight". Further details: IAPB Secretariat, LV Prasad Institute, LV Prasad Marg, Banjara Hills, Hyderabad 500 034, India (tel: 091-40-215389; fax: 091-40-248271; email: IAPB@lvpeye.stph.net).

Ophthalmological Clinic, University of Creteil

An international symposium on the macula will be held on 1-2 October 1999 at the Ophthalmological Clinic, University of Creteil. Further details: Professor G Soubrane, Chef de Service, Clinique Ophtalmologique Universitaire de Creteil, Centre Hospitalier Intercommunal, 40 Avenue de Verdun, 94010 Creteil, France (fax: 01 45 17 52 27).

Jules François Prize

The 2000 Jules François Prize of \$100 000 for scientific research in ophthalmology will be awarded to a young scientist who has made an important contribution to ophthalmology. All

topics in the field of fundamental and/or clinical research in ophthalmology will be considered. The application should be sent jointly with a curriculum vitae, the list of all publications, and three copies of the candidate's 10 most relevant publications to Jules François Foundation Secretary, Professor Dr M Hanssens, Dienst Oogheelkunde, de Pintelaan 185, B-9000 Gent, Belgium. Deadline for applications 31 December 1999.

XXXIV Nordic Congress of Ophthalmology

The XXXIV Nordic Congress of Ophthalmology will be held in Reykjavik, Iceland, 18-21 June 2000. This meeting celebrates the 100 year anniversary of the Nordic Ophthalmology Conference. Further details: Iceland Incentives Inc, Hamraborg 1-3, Is-Kopavogur, Iceland (tel: +354 554 1400; fax: +354 554 1472; email: incentiv@itm.is).

DR-2000, International Forum on Diabetic Retinopathy

The International Forum on Diabetic Retinopathy will take place on 7-9 September 2000 at the Palazzo Reale, Naples, Italy. Further details: Francesco Bandello, Congress Secretariat, MGR Congressi, Via Servio Tullio, 4, 20123 Milano, Italy (tel: 39 02 430071; fax: 39 02 48008471; email: dr2000@mgr.it).

12th Afro-Asian Congress of Ophthalmology

The 12th Afro-Asian Congress of Ophthalmology (Official Congress for the Afro-Asian Council of Ophthalmology) will be held on 11-15 November 2000 in Guangzhou (Canton), China. The theme is "Advances of ophthalmology and the 21st century". Further details: Professor Lezheng Wu, Zhongshan Eye Center, SUMS, New Building, Room 919, 54 Xianlie Nan Road, Guangzhou 510060, PR China (tel: +86-20-8760 2402; fax: +86-20-8777 3370; email: lwuicv@gzsums.edu.cn).