FAOPS NEWSLETTER

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FAOPS HAS THREE NEW MEMBERS

The General Assembly (GA) of FAOPS has recently approved admissions of three new members, one regular and two associates, at its meeting in Brisbane in September 1998. The new members are the Physiological Society of Philippines (PSP), the Pakistan Physiological Society (PPS), and the Indonesian Physiological Society (IPS). When added to the member list, FAOPS now has 13 regular and 15 associate members.

PSP, which was admitted as a regular member, was established in 1981 and currently has 53 regular members in its society. The president of PSP is Prof. Angelica Francisco. Her contact address is: Department of Physiology, University of the Philippines, Manila, College of Medicine, 547 Pedro Gil Street, Manila 1055, the Philippines (Tel: +50-05-536-0374)

PPS has nearly 250 regular members, and was established in 1987 about the same time when FAOPS was initiated. This society joined IUPS as an affiliate member in 1993 and applied for an associate member of FAOPS in 1996. According to the previous Constitution, the admission can be granted only at the regular meeting of GA. The admission process is, therefore, delayed till September 1998. Fortunately, however, an approval has been made by the GA at the meeting in Brisbane to change the process. From now on, the Council can grant admission to new applications at any time then reports to the GA at its regular meeting. Prof. Muhammad Ayub at the Department of Physiology, Ayub Medical College in Abbotabad is the president of PPS. Its general secretary is Assoc. Prof. Arif Siddiqui at the Department of Physiology, The Aga Khan University, Stadium Road, Karachi, Pakistan (Fax: 493-4294)

IPS has been established since 1964 and has about 200 members. This society has considered to join FAOPS several years ago, but only recently then the decision to apply for an associate member was made, just in time for the GA meeting in Brisbane. The president and the general secretary are respectively Profs. B. Soedijono and A. Purba. The address of the secretariat is: Bagian Ilma Faal Fakultas Kedoc teran, Universitas Padjadjaran, Jalan Ir. H. Juanda No. 248, Bandung 40134, Indonesia (Tel: 250-1953).

INSIDE

EDITORIAL

Readers of the previous issue of FAOPS Newsletter may have noticed from the minutes of 1998 General Assembly that FAOPS Council has appointed a 7-membered Committee on Publication. The committee chaired by myself consists of Profs. Akimichi Kaneko, Ian McCance, Fereshteh Motamedi, Bao-Min Li, W. Selvamurthy and Nor Anita. This committee is set up to help contributing news from their respective societies, articles or other informa toin as well as providing guidance to the Editor so as to maintain regular publications, and to improve quality and the usefulness of the newsletter. The committee met in Brisbane at the time of Brisbane'98 Congress last year, and planned to publish two issues per volume starting from volume 8, 1999. A new column, which is believed to gain interest from and be beneficial to a large number of readers, will be devoted to "Physiology Teaching". This topic now becomes an integral part of all physiology meetings both regionally and globally. We hope that after improvement this publication will be of more value to the readers.

In additon, to minimize the extremely expensive postal and handling cost, the Physiological Society of Japan has kindly agreed to reproduce their own copies from the master for local circulation. This results in a substantial reduction in the cost of postage by almost one-third. Thanks are due to this generous help. Similar helps by other societies will be most grateful. Besides, an arrangement has been made to post the newsletter on the web of the ADInstruments company, who is currently our major sponsor. The volume 7 , 1998 is the first issue to be appeared on the web site "http://www.adinstruments.com/FAOPS". Please visit us at the above address.

In this issue, many members of the committee have achieved their commitments and contributed several interesting articles. Unfortunately, a proper column on "Physiology Teaching" is still not ready. Therefore, I included some infomation concerning problem-based learning which may be of your interest as well. I hope we will have some infomation from the International Workshop on Physiology Teaching hosted by our new member, the Pakistan Physiological Society, in April 1999 in the second issue of this volume.

Meanwhile, I wish to call for contributions from all readers of FAOPS Newsletter. All sorts of in formation conformed to the present format are welcome. The deadlines for submission of your writings are April 30 and October 31 for the issues number 1 and 2, respectively, of each volume. Please forward your news, viewpoints, perspectives or review articles to the following address:

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Chumpol Pholpramool, Ph.D.
May 31, 1999

PHYSIOLOGY UPDATE

Retinal mechanism of the lateral inhibition and directional selectivity: An old question asked again now

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The vertebrate retina is not merely a photoreceptive organ, but a small brain where the image of the external world is extensively processed before the visual information is sent to the brain. The image of the external world is projected on the two-dimensional mosaic of photoreceptors and decomposed to an array of pixels that correspond to the photoreceptor mosaic. The mosaic is fine in the central fovea and coarse in the retinal periphery. Two types of signal processing are the major functions; enhancement of the image contrast and detection of target movement.

The neural circuit of the retina is made of mainly two parts; a straight pathway consisting of photoreceptors → bipolar cells → ganglion cells (the axon of which is the optic nerve), and the lateral pathways made of horizontal cells and amacrine cells. The lateral pathway provides the route for signals generating interactions between the straight pathways. All neurons in the distal retina (photoreceptors, bipolar cells and horizontal cells) do not generate action potentials. They respond to light only with graded potential changes.

It has been well known since early 1950s that the receptive field of an optic nerve (namely a ganglion cell) has an antagonistic center-surround structure (Kuffler, 1953). A diffuse light covering the whole receptive field stimulates both the excitatory center and the inhibitory surround simultaneously (or in half of ganglion cells, inhibitory center and the excitatory surround). Since the center and the surround kills the effects mutually, the response evoked by diffuse light is weak. The most effective stimulus activating cells with such receptive field structure is the light-dark border that is in register with the center-surround border of the receptive field. The center-surround antagonism provides the neural basis for the lateral inhibition and the underlying mechanism for the enhancement of the image contrast.

Soon after the success of intracellular recording of single photoreceptor cells (Tomita et al, 1967), it has been shown that lateral inhibition is detectable at the first stage of retina, namely in cone photoreceptors. Photoreceptors respond to light with graded hyperpolarization, but when a flash of concentric annulus was given, a depolarizing voltage change was evoked (Baylor & Fuortes, 1970). Similar depolarization was induced in a cone when nearby horizontal cells are hyperpolarized by an injection of extrinsic current (Baylor, Fuortes & O'Bryan, 1971). Due to the electrical coupling horizontal cells have a large spatial summation, and are the most adequate candidate for the surround inhibition to cones. Supporting evidence of horizontal cell → cone feedback has been presented by Wu (1991) who showed that illumination of cones in the retinal slice of the tiger salamander produced hyperpolarizing light responses, but depolarizing response in cones that lost its light-sensitive outer segments. Demonstration of GABA as the transmitter of horizontal cells (Lam et al, 1979) and GABA receptor in the cone terminals (Tachibana & Kaneko, 1984) strengthened the notion that the negative feedback from horizontal cells to cones is mediated by GABA.

GABA-mediated feedback from horizontal cell to cones has long been accepted as the basic mechanism of lateral inhibition observed in cone photoreceptors, but recently an opposing hypothesis has been presented by Verweij, Kamermans & Spekreijse (1996). They demonstrated in the goldfish cones that surround illumination enhances the calcium current in cones recorded by the patch clamp technique in the whole-cell clamp configuration. They further demonstrated that the calcium current enhancement induced by surround illumination was not affected either by GABA or GABA antagonists, indicating that the surround effect is not mediated by GABA. This finding supports that horizontal cells are mediating the surround effect but opposes the GABA as the transmitter. Unfortunately, it is extremely difficult to interpret the calcium current modulation by surround illumination. If GABA-mediated feedback from horizontal cell to cones is not responsible for the formation of the receptive field surround, the old question of how the

(Continued on page 5)

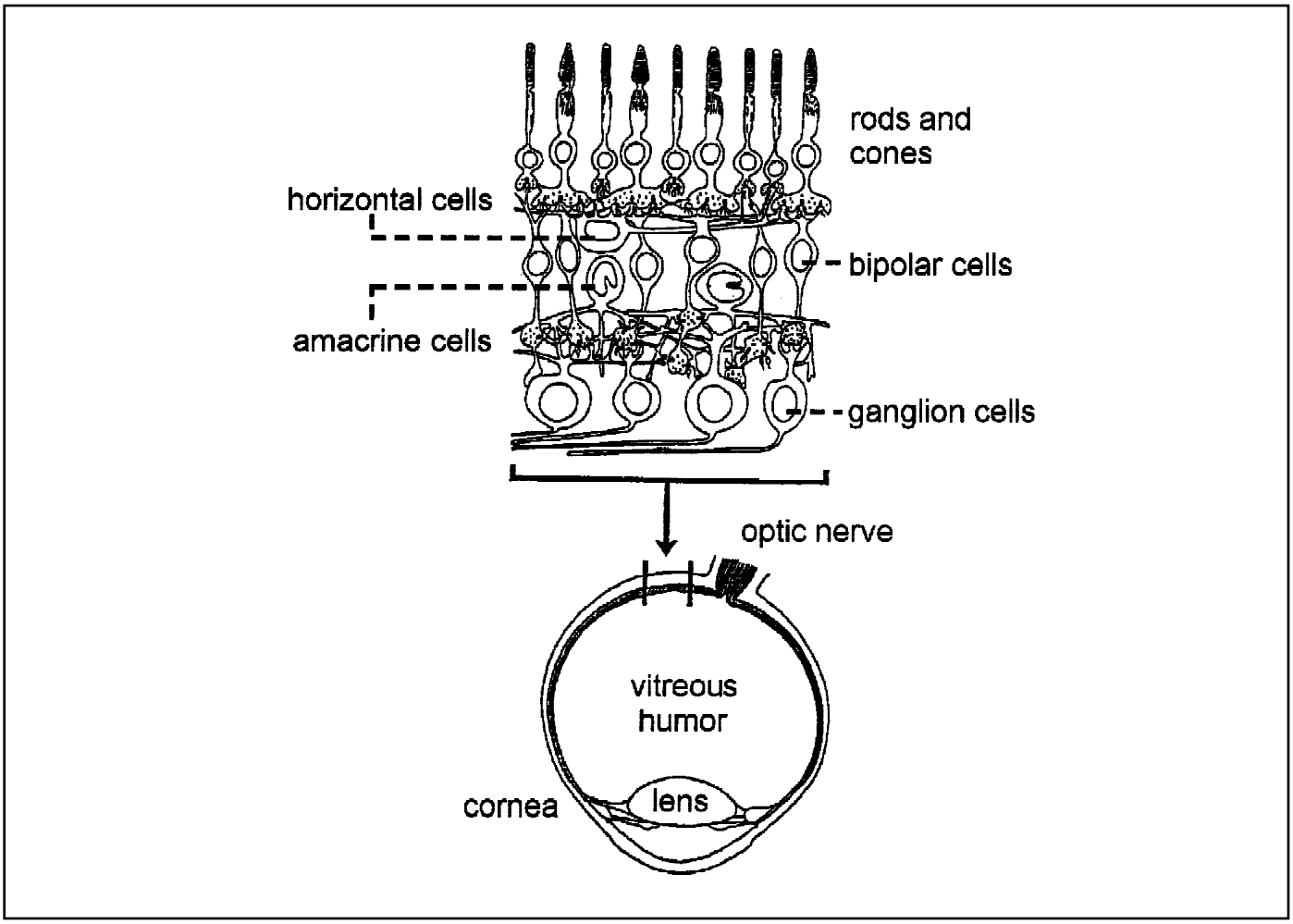

Fig. 1. Schematic drawing of the vertebrate retina.

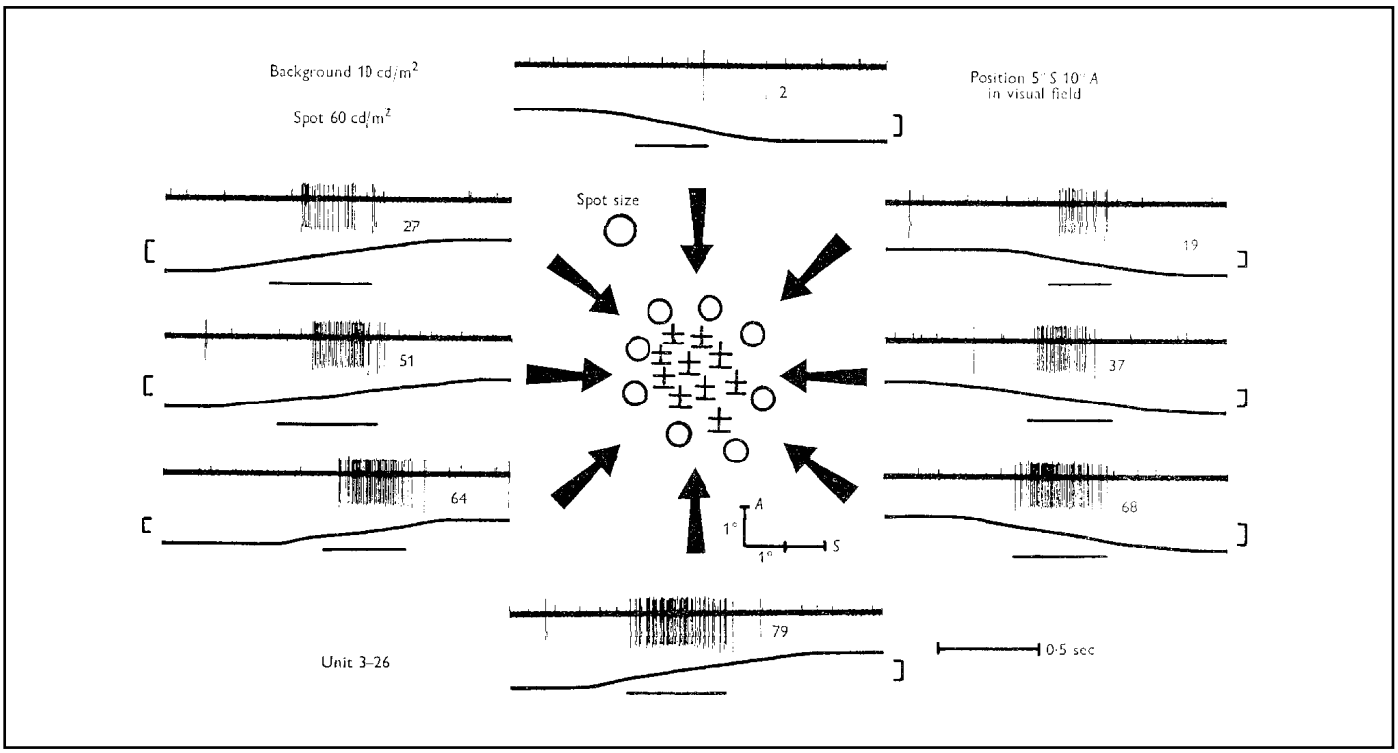

Fig. 2. Response of a rabbit ganglion cell showing directional selectivity. Small spot of light was moved in the direction indicated by arrows. Note that a brisk response was generated when the spot was moved upwards, while almost no response was seen when the spot was moved in the opposite direction. (From ref. 9 with permission).

receptive field surround is made is coming back as a puzzle.

Movement sensitivity is the second major function of the vertebrate retina. Our visual system is very sensitive to a moving object particularly in the peripheral visual field, and this sensitivity is created in the retina. Neuronal responses in the distal retina (photoreceptors, bipolar cells and horizontal cells) persist as long as the light is turned on. Neurons in the proximal retina (amacrine cells and ganglion cells) respond to light with either sustained or transient voltage changes. Conversion of a sustained signal to a transient signal is the first basis of movement sensitivity. Furthermore, in ganglion cells of lower vertebrates and mammals, such as rabbits, we can find cells responding to a moving target with one particular direction. We refer to these cells as "directionally selective" neurons. They respond with brisk spike discharges to the target moving to the "preferred" direction, but are suppressed by the movement in"null" direction.

Since the first discovery of directionally selective ganglion cells in the rabbit retina by Barlow, Hill & Levick (1964), it has been discussed which cells and what retinal circuits are responsible to the directional selectivity. Currently the consensus of the retina researchers is that the neuronal circuit in the proximal retina including amacrine cells are responsible. Since the directionality was lost by the application of cholinergic blockers or GABAergic blockers, it has been speculated that the cholinergic and GABAergic amacrine cells are involved in this circuit. Starburst amacrine cells (Masland & Tauchi, 1986), located both in the inner nuclear layer and in the ganglion cell layer (displaced amacrine cells), are thought to be the most likely candidate for the excitatory signal source to directional sensitive ganglion cells from the dense distribution of their dendrites and of cholinergic nature.

A surprise came from the laboratory which has long been working on the physiological and morphological characterization of starburst amacrine cells. Because starburst amacrine cell nuclei can be vitally stained with DAPI, a nuclear dye, they can focus the laser beam to labeled starburst amacrine cells to heat-coagulate them selectively (He & Masland, 1997). Surprising finding was that the directional sensitivity was maintained even after the starburst amacrine cells had been ablated.

Both of these recent findings described above threw a strong doubt to the existing hypothesis that has been widely believed. No alternative hypothesis is available now, and the old puzzles we asked a decade ago returned. For sometime, we have to design experiments to answer these puzzles to understand the retinal function.

Acknowledgements

The work carried out in the author's labotaroty and mentioned in this article has been supported by grants from various sources; of these main supports were provided by the Ministry of Education, Science and Culture of Japan, the Human Frontier Science Program and the Retina Research Foundation.

References

1. Kuffler, S.W. (1953) Discharge patterns and functional organization of mammalian retina. *J Neurophysiol.* 16:37-68.

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8. Verweij, J., Kamermans, M., Spekreijse, H. (1996) Horizontal cells feed back to cones by shifting the cone calcium-current activation range. *Vision Res.* 24:3943-3953.

9. Barlow, H. B., Hill, R. M. & Levick, W. R. (1964) Retinal ganglion cells responding selectively to direction and speed of image motion in the rabbit. *J. Physiol. (Lond.)* 173: 377-407.

10. Masland, R. H. & Tauchi, M. (1986) The cholinergic amacrine cell. *Trends Neurosci.* 9: 218-223.

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Useful Resources in PBL

PHYSIOLOGY TEACHING

Since the invention of a new student centered and active learning method known as "Problem-Based Learning" has been introduced, several medical schools throughout the world adopted this method in their curriculum for preclinical and clinical years. Although debates about the pro and con of this teaching method are not settled especially in the old schools in which conventional teaching has been practiced for many years, PBL is still an interesting alternative for many schools. The following information may be useful for those who are interested in PBL.

Bibliography:

1. Albanese, M.A. & Mitchell, S. (1993) Problem-based learning: A review of literature on its outcomes and implementation issues. *Academic Medicine* 68: 52-81.

This is a frequently-cited review article, which focuses primarily on medical education, the only arena where there are many published outcoms studies of PBL.

2. Boud, D. & Feletti, G. eds, 2nd edn, (1997) *The Challenge of Problem Based Learning,* St. Martin's Press, New York

This is a classic reference on PBL. It contains articles on many aspects, including description of PBL, curriculum design and implementation, examples from different professions, and assessment.

3. Duch, B.J., Allen, D.E. & White, H.B. III (1998) PBL: Preparing students to succeed in the 21st century, *Essays on Teaching Excellence: Towards the Best in the Academy,* 9(7): 1-2., reprinted in PBL Insight, 1(2): 3-4, available online (http://www.samford.edu/pbl).

Compact "how to" about PBL in any discipline, including writing problems and managing multiple groups.

4. Mierson, S. (1998) A problem-based learning coures in physiology for undergraduate and gradu ate basic science students. *American Journal of Physiology* 275 *(Advances in Physiology Education,* 20): S16-S27.

This article is not specific only for physiology, but it contains lots of practical ideas for setting up a PBL course and making groups work, a comparison of "dedicated" vs. "roving" facilitator formats, and student reactions to PBL.

5. Vernon, D.T.A. & Blake, R.L. (1993) Does problem-based learning work? A meta-analysis of evaluative research. *Academic Medicine* 68: 550-563.

Another frequently-cited review article, also focused on medical education. The results generally support the superiority of PBL over more traditional teaching methods.

6. Wilkerson, L. & Gijselaers, W.H., eds., (1996) Bringing Problem-Based Learning to Higher Education: Theory and Practice, *New Directions for Teaching and Learning,* No. 68:43-52.

Articles from a variety of disciplines.

Internet web sites:

1. University of Deleware PBL web page. *http://www.udel.edu/pbl/*

Focuses on undergraduate and graduate educational settings. Has links to other web page on PBL.

2. Email list about PBL in under graduate education.

To subscribe, send command: subscribe ud-pbl-undergrad, in the body of email addressed to: *majordomo@udel.edu.* Archive: *http://www.egroups.com/list/ud-pbl-undergrad/*

3. Samford University PBL web page. *http://www.samford.edu/pbl*

Focuses on undergraduate settings. Has newsletter *PBL Insight* online, published 3 times a year. Links to other sites.

4. Email list about PBL & related learning methods in the health sciences.

To subscribe, send the command: subscribe pblist Your Name; in the body of email addressed to: *listserv@iupui.edu.;* Archive: *htpp://listserve.iupui.edu/archives*

5. Center for Problem-Based Learning, Illinois Mathematics and Science Academy, web page. *http://www.imsa.edu/team/cpbl/cpbl.html*

Focuses on K-16 educational settings. Includes links to many other PBL web page, extensive bibliography and information on email lists.

6. Case Studies in Science, State University of New York at Buffalo, web page. *http://ublib.buffalo.edu/libraries/projects/cases/case.html*

Includes PBL as one method of teaching with cases.

7. A Personal Casebook by P.K. Rangachari, a creative problem-writer at McMaster University.

Includes guidelines for writing problems, sample problems for Pharmacology and for Arts and Sciences inquiry courses, and use of problems for evaluation of students.

8. Bibliographies on PBL can also be found at the following web sites: *http://www.imsa.edu/team/cpbl/intro/intro*/docs.html *http://edaff.siumed.edu/dept/Pblbib.htm*

MEETING CALENDAR

81ST Annual Meeting of the Endocrine Society, San Diego, CA, USA
81 st Annual Meeling of the
Endo **crine Society,** San Diego,
CA, USA
12-15 June 1999
Contact: Kim Akoto,
The Endocrine Society, 4350
East West Highway, Suite 500,
Bethesda, MD 20814-4410, USA
Tel: +1-301-941 0220
FAX: +1-301-941 0259
http://www.endo-sociey.org

FASEB Summer Research Conferences
12 June- 20 August 1999
Contact: FASEB Summer Research
Conferences, 9650 Rockville Pike
Bethesda MD 20814-3998, USA
FAX: +1-301-571 0650
http://www.faseb.org

The 1999 Frontiers in Reproduction: Critical functional events in pregnancy, Wood Hole, USA
30 June-2 July 1999
Contact: Michael E.McClure, Ph.D.
Organ and System Toxicology Branch,
Division of Extramural Research and
Training, National Institute of Environmental Health Sciences, NIH
111 T.W. Alexander Drive
Research Triangle Park, NC 27709,
USA
Tel:+1-919-541 5327
email: mm46tn@nih.gov

2nd FEPS Congress, Prague, Czech Republic,
30 June-4 July 1999
Contact: Dr. Eva Sykova,
Institute of Experimental Medicine,
ASCR Videnska 108, 142 20
Prague 4, Czech Republic
Tel: +420-2-475-2682
FAX: +420-2-475-2783
email: sykova@biomed.cas.czl

5th International Congress: The Cell Biology of Reproduction, Cambridge, UK
1-3 July 1999
Contact: Congress Secretariat
PO Box 3219, Barnes,
London SW 13 9XR,UK
Tel: +44-181-741 1311
FAX: +44-181-741 0611
email: CourseRegs@aol.com

IV International Conference on Boar Semen Preservation (ICBSP), Beltsville, USA
8-11 August 1999
Contact: Dr. Larry Johnson
IV Inter. Conf. Boar Semen Presv.
P.O. Box 1552
Beltsville, MD 20704, USA
Tel: +1-301-504 8545,
FAX: +1-301-504 5123
email: boarconf@Lpsi.barc.usda.gov

49th Harden Conference: Functional Aspects of Energy Metabolism in Brain; Relationship to brain development and neurodegenerative diseases, Oxford, UK
14-18 August 1999
Contact: Meetings Office, Biochemical Society,
59 Portland Place, London W1N 3AJ,
UK
Tel: +44-171-580 3481
FAX: +44-171-637 7626
email: meeting@biochemsoc.org.uk
http://www.ion.ucl.ac.uk/neurochemistry/meeting/html

50th Harden Conference: Annexins, Kent,UK
1-5 September 1999
Contact: Meetings Office, Biochemical Society,
59 Portland Place, London W1N 3AJ,
UK
Tel: +44-171-580 3481
FAX: +44-171-637 7626
email: meeting@biochemsoc.org.uk
http://www.biochemsoc.org.uk/meetings/harden 50/default.htm

9th Meeting of the European Neuroendocrine Association and Workshops, Copenhagen & Odense, Denmark
3-7 September 1999
Contact: Dr. Michael Hansen-Nord,
Skolevej 6, 5270 Odense N, Denmark
Tel: +45-6618 3303
FAX: +45-6618 3403
email: IGF-99@bristol.ac.uk.

5th International Symposium on Insulin-like Growth Factors, Brighton, UK
31 October-4 November 1999
Contact: Jeff Holly,
University Division of Surgery, Level
7, Bristol Royal Infirmary,
Marl borough Street,
Bristol BS28 HW, UK
FAX: +44-117-925 2736
email: IGF-99@bristol,ac,uk

190th Meeting of the Society for Endocrinology, London, UK
22-23 November 1999
Contact: Society for Endocrinology,
17/18 The Courtyard , Woodlands,
Bradley Stoke, Bristol BS32 1NQ,UK
Tel: +44-1454-699036
FAX: +44-1454-616071
email: info@endocrinology.org
http://www.endocrinology.org

British Andrology Society/Society for the Study of Fertility joint meeting, Coventry, UK
15-17 December 1999
Contact: Dr. S. Hicks
Dept. Biological Sciences, University
of Warwick, Coventry CV4 7AL, UK
Tel: +44-1203523540,
FAX: +44-1203 523701
email: s.j.hicks@warwick.ac.uk

PERSPECTIVES

THERAPEUTIC USE OF NITRIC O IDE IN HIGH ALTITUDE PULMONARY EDEMA

High altitude pulmonary edema (HAPE) is a life threatening condition characterized by pulmonary hypertension, increased pulmonary capillary permeability , and hypoxemia. Acute effect of inhaled nitric oxide (NO) , 50% oxygen, and a mixture of NO plus 50% oxygen on hemodynamics of gas exchange was studied in fourteen male soldiers with symptoms of HAPE as judged by Lake Louise score (6.4+0.7) , PaO_2 (35+3.1mmHg), and alveolar to arterial oxygen tension difference ($AaDO_2$) (26+3mm Hg) (Anand et al. 1998) . Each gas mixture was given in random order for 30 min followed by 30 min washout with room air. NO had a selective effect on the pulmonary vasculature and did not alter systemic hemodynamics. Compared with room air , pulmonary vascular resistance fell 36% with NO ($p<0.001$) , 23% with oxygen ($p<0.0001$ versus air, $p<0.05$ versus NO alone) and 54% with NO plus 50% oxygen ($p<0. 001$ versus air, $p<0.0005$ versus oxyen and versus NO) . NO alone improved PaO_2 (+14%) and $AaDO_2$ (-31%). However, NO and 50% oxygen has greater, effect on $AaDO_2$ (-18%) and PaO_2 (+21%).

Findings indicate that inhaled NO improved arterial oxygenation and diminished pulmonary arterial pressure in patients with profound hypoxemia, moderately sever pulmonary hypertension and overtly symptomatic pulmonary edema. Although treatment with either inhaled NO or oxygen acutely improved oxygenation and lowered pulmonary pressure, but use of inhaled NO and oxygen together caused an additive effect on pulmonary hemodynamics and an even greater effect on gas exchamge. This study represents the first report of the theraputic use of inhaled NO in acutely ill patients with HAPE at altitude and may provide some insight into the mechanisms whereby NO and oxygen improve gas exchange in an hypoxic hypobaric atmosphere.

Reference:

Inder S. Anand, B.A.K. Prasad, Sumeet S. Chugh, K.R.M. Rao, David N. Cornfield, Carlos E. Milla, Navneet Singh, Surgh, Surjit Singh, William Selvamurthy (1998) Effects of inhaled nitric oxide and oxygen in High-Altitude Pulmonary Edema. *Circulation* 98:2442-2445.

HYPOPHAGIA AT HIGH ALTITUDE

With easier accessibility to High Altitude (HA), more and more people visit high mountains for mountaineering, tourism and other occupations and many may display symptoms of Acute Mountain Sickness (AMS) which include loss of appetite (anorexia) resulting in decrease in food intake (hypophagia). Feeding behaviour of an individual is influenced both by internal state and external environment factors like heat, cold and hypoxia. Studies were carried out to determine the feeding behaviour and gustatory responses in rats subjected to intermittent and continuous exposure to simulated HA (7,620m) under controlled conditions of temperature and humidity (Singh et al., 1996) . Further, human volunteers were taken to actual fields conditions, at an altitude of 3,500 m to investigate the change in taste thresholds, hedonicity and intensity (Singh et al., 1997) . Results indicated a decrease in daily food and water intake, body weight and showed preference for the sweet solutions over other taste solutions. Both intermittent and continuous exposure to HA produced qualitatively similar results but in continuous exposure results were quantitatively more accentuated. Human volunteers showed an increase in the taste-thresholds for glucose and sodium chloride while quinine sulphate and citric acid thresholds recorded a decrease. The taste intensity ratings showed a linear relationship with increasing logarithmic molar concentration of each solution, All the parameters recorded at high altitude (HA) showed a tendency to return to basal values after reinduction to sea-level. Present work leads one to conclude that HA hypoxia causes alteration in the taste hedonic matrix in terms of taste thresholds, intensity ratings and affective domains of pleasantness / unpleasantness. The alteration in the taste hedonics are noticeable as early as on the fourth day of HA stay. It is conceivable that hypophagia and weight loss observed at HA could be ameliorated by providing a palatable carbohydrate rich diet.

References :

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2. S.B. Singh, A. Sharma, D.K. Yadav, S.S.Verma, D.N. Srivastava, K.N. Sharma and W. Selvamurthy (1997) High altitude effect on human taste intensity and hedonics. *Aviat. Space. Environ. Med.* 68:1123-1128.

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New Members of FAOPS' Executive (1998-2002)

The First Vice-President

Professor Fereshteh Motamedi

Professor Fereshteh Motamedi was born in Tehran, Iran in 1944. She received her Ph.D. degree in Physiology from the University of Columbia-Missouri, USA in 1978. After her graduation she joined the Department of Physiology, Faculty of Medicine, Shaheed Beheshti University of Medical Sciences, Tehran, and became a full professor and the Head of the department since 1988. Her research interest is in various areas of neuroscience such as physiology and pharmacology of basal ganglia, sleep, pain, and learning and memory. She is the only female member of the Iranian Academy of Medical Sciences, and the president of the Iranian Society of Physiology and Pharmacology since 1993, which reflects her distinction in sciences. Prof. Motamedi has served in the Council of FAOPS from the early stage of its establishment and plays a key role in fund raising activities. She is also a member of FAONS Council.

The Second Vice-President

Professor Swee Hung Cheah,

Professor Swee Hung Cheah, a native of Malaysia, received his B.A. degree from the University of Oregon, Eugene, USA in 1973, and later his Ph.D. degree from the University of Illinois, Urbana- Champaign, USA in 1981. Presently,he is an Associate Professor and the Head of Monoclonal Laboratory at the Department of Physiology, Faculty of Medicine, University of Malaya, Kuala Lumpur. His research interests are rather diversified including development of immunoassays and hybridoma and antibody technology, biological effects of natural products (mainly marine flora and fauna) and Physiology of relaxin. Prof. Cheah is the president of the Malaysian Society of Pharmacology and Physiology (1998-1999), a member of Evaluation Panel for Health and Medical Sciences of the National (Malaysian) Accreditation Board. He is the Chairman of the Organizing Committee of the 5th FAOPS Congress to be held in Kuala Lumpur in 2002.

ANNOUNCEMENTS

S.K. MANCHANDA MEMORIAL FIPS ORATION

S.K. Manchanda memorial "FIPS oration" will be the most prestigious award given by the Federation of Indian Physiological Societies. It would be awarded to distinguished scientists in the field of Physiology. The award would be given to one Indian and one foreign scientist, working in any branch/discipline of Physiology during the FIPS Congress which normally takes place, once in three years.

The Award

The award will be given in the form of a plaque. The Indian scientist receiving the award will be provided the travelling allowance in the form of lst Class (2 AC sleeper) train fare, to travel from the place of stay of the scientist to the venue of the conference and back. The foreign scientist will have to arrange the traval expenses from sources available to him/her. The organisers of the Congress will provide local hospitality to both the awardees. The awardee will be required to submit a written manuscript on the topic in which he / she will be delivering the oration.

Selection of the awardee

A selection committee for the award would be appointed by the Executive Council of FIPS. This selection committee should consist of some of the most eminent physiologists within the country. This committee would go through all the nominations and try to arrive at a unanimous decision. In case, it is not possible to arrive at a unanimous decision, the majority vote would decide the awardee.

All scientists working in the field of physiology in the country should send their proposals for the award through their respective physiological societies. The constituent societies can forward one or a maximum of two proposals to the FIPS office. This would ensure the screening of the suggested candidates at the first level. Foreign scientists, who are not members of any Physiological Society in India, may be allowed to send proposals directly to the FIPS office. In addition, the nominations could be submitted by the members of the Executive Council of the FIPS also. The limited number of proposals, routed through the various channels, would be taken up for consideration by the Selection Committee. The criteria for the selection of the awardee would be purely scientific. But due weightage can be given to the contribution made by the scientists for the development of physiological sciences in India. The proposer should give an undertaking that the nomimee will attend the conference of FIPS and deliver the oration.

The candidature of the members of the Selection Committee will not be considered for this award. The format given below, will be used for collecting the necessary about candidate.

NOMINATION FORM FOR THE AWARD
OF S.K. MANCHANDA MEMORIAL FIPS ORATION
(please submit 12 sets of nominations)

1. Name & Designation of Candidate _____
2. Address _____
3. Date of Birth _____
4. Highest Academic Qualification _____
5. Experience (attach separate sheet as Appendix-I) _____
6. Five most important Awards/ Honours receives _____
   (Please give in Appendix-II)
7. No. of Publications _____
8. Research field _____
9. Membership of National/ International Organisations _____
   (Mention five important ones _____
   in separate sheet-Appendix-III)
10. Whether Indian or Foreign National or green card holder _____
11. Short summary (about 200 words)
    of the most significant research
    contributions of the candidate (Appendix IV)
12. Proposed by (give full address) _____

The nominee (candidate) if selected for the awards will attend the conference of FIPS and deliver the FIPS oration. Foreign scientist, if selected for the award, may kindly arrange travel expenses from sources available to him/her.

The Third World Academy of Sciences

Awards in Basic Sciences

Purpose

The TWAS Awards in Basic Sciences were instituted in 1985 to recognize and support outstanding achievements made by scientists from developing countries. The Awards are the highest recognition accorded by the Academy for excellence in scientific research in the Third World. They are awarded to those individual scientists in developing countries whose research work has made significant contributions to the advancement of sciences.

Nature

Five Awards in Basic Sciences are given each year in the fields of Basic Medical Sciences, Biology, Chemistry, Mathematics and Physics. Each award consists of a prize amounting to US$ 10,000 as well as a plaque on which major contributions of the award winner are mentioned. The Awards are usually presented on a special occasion, normally coinciding with the General Meeting of the Academy and/or General Conference organized by the Academy.

Eligibility

Candidates for the awards must be nationals of developing countries and, as a general rule, working and living in those countries. Members of the Third World Academy of Sciences are not eligible.

Nominations

Nominations are made on the relevant TWAS nomination form and should clearly state the contributions which the candidate has made towards the development of the particular field of science for which the award would be given. The nomination should be accompanied by a 1-2 page biographical sketch of the nominee including his/her major scientific accomplishments, a list of 12 of the candidate's most significant publications as well as a complete list of publications and biodata.

Nominations for the awards are invited from all Members of the Third World Academy of Sciences as well as from science academies, national research councils, universities and scientific institutions in developing and advanced countries.

Selection

The Awards are highly competitive and the selection of the awardees is made solely on scientific merit. Only those candidates who meet the awards, standard of having made outstanding scientific discoveries will be selected for the awards. A committee of TWAS members has been appointed by the TWAS Council for each of the five awards, and is charged with selecting the awardees.

Deadline

Nominations for awards should reach the Third World Aca- demy of Sciences no later than 1 March of each year. Nominations received after this deadline will be considered of the following year.

Inquiries

lnquiries and completed nomination forms should be addressed to:

Ms. Helen Grant
TWAS Awards in Basic Science
Third World Academy of Sciences
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