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FAOPS

NEWSLETTER

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FAOPS grants travel award to assist 10 young investigators of Asia to participate in the IUPS Congress in Christchurch.

by *Akimichi Kaneko, Secretary of FAOPS*

In accordance with a resolution of the 7th FAOPS Council Meeting, held in Kuala Lumpur on 19 November, 2000, FAOPS decided to assist scientists from Asia to attend the IUPS Meeting with an understanding that these funds would be additional to any funds provided under the IUPS Young Investigator Award (YIA) scheme. Although FAOPS has made every effort to raise funds for travel assistance it had had little success. Fortunately, we have received a generous grant from the Physiological Society of Japan, which enables us to assist a few applicants. The Executive Director of IUPS Congress 2001 was approached and asked to supply a ranked list of unsuccessful candidates from Asia. Professor Young, the President of FAOPS, established a selection committee consisting of himself and an Australian colleague together with the Secretary of FAOPS to select awardees and to determine the amount of each award.

Ten candidates have been selected: 3 from India, 2 from China, 2 from the Philippines, 1 from Pakistan, 1 from Sri Lanka and 1 from Thailand. Each awardee was offered a grant of JPYen 220,000 equivalent approximately to US$1,750. The recipients are: Dr Baisali RAY (India), Dr Sukhjit Kaur SANDHU (India), Dr Kamalesh K. GULIA (India), Dr Zia ur Rehman ZIA (Pakistan), Dr Jian-Feng HU (China), Dr Ping SONG (China), Dr Vajira Senaka WEERASINGHE (Sri Lanka), Dr Glorina POCSIDIO (Phillipines), Dr Noel M. UNCIANO (Phillipines), and Dr Chaweewan JANSAKUL (Thailand).

In addition, two grants, each of approximately US$1,000 have been offered to Dr Adeniyi (Papua New Guinea) and Professor Hang (Vietnam) using funds left over from the last FAOPS Congress in Brisbane.

Editorial

I trust that many of us have registered for the IUPS Congress 2001 and are looking forward to visiting Christchurch in August. For those who have not yet decided, it is still not too late since the organizer has extended the acceptance of abstracts till the last minute! However, those received in the four weeks prior to the meeting may not be included in the program CD. By now, the applicants for the IUPS 2001 Young Investigator Awards should have been notified of the supports. Very recently, FAOPS announced that the selection committee had granted travel awards to support ten young scientists from its member societies to attend the meeting. The detail of the grants is on the front page. Next year, there will be another important meeting, the 4th FAOPS Congress 2002, from September 23-26 in Kuala Lumpur. In this issue, I have asked Prof. Swee Hung Cheah, Chairman of the local organizing committee, to inform us of his preparation for the congress. His write up is on page 3.

The highlight of this issue is an article on the analysis of physiology teaching in a PBL school by Prof. Usha Nayar and her colleagues. The article is reproduced from the journal 'Advances in Physiology Education', volume 22, 1999. Prof. Nayar is very keen in physiology teaching and plays an active role in a number of physiology teaching workshops sponsored by IUPS and FAOPS. Thanks are given to both the authors and the publisher, the American Physiological Society, for their kind permission to reproduce the article in FAOPS Newsletter. I hope the article will be of interest to the readers.

Once again, I wish to call for inputs from the readers especially those who are keen in physiology teaching. Please share us your expertise and experiences. Notes from SIG (Special Interest Group) as well as suggestions and comments on the newsletter are welcome.

Chumpol Pholpramool, Ph.D.
The Editor
Email: sccpp@mahidol.ac.th

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4th HUGO Pacific Meeting and 5th Asia-Pacific Conference on Human Genetics
"From Genome to Proteome"
October 27-30, 2002
Pattaya, Chonburi, Thailand

Topics to be discussed:

- Genomics
- Proteomics
- Postgenomic medicine
- Bioinformatics
- Genotype analysis with new technologies; microarrays, SNPs and diseases, gene quantification
- Gene expression
- Genotype-phenotype interaction
- Complex disorders; atherosclerosis, cancer, neurodegenerative disorders
- Pharmacogenomics
- Anthropology
- Education, law and ethics

Deadline for abstracts: **31 May 2002**

Congress Secretariat:
Institute of Science and Technology for Research and Development
Mahidol University, Salaya Campus
25/25 Phutthamonthon, Nakornpathom 73170, Thailand
Tel: +66-2-8892557-8
Fax: +66-2-8892559, +66-2-4411013
Email: grsfc@mahidol.ac.th
Web site: http://www.mu-st.net/hugothai

An Invitation to the 4th FAOPS Congress 2002

by *Hung Swee Cheah, President of the FAOPS Congress 2002*

The 4th Scientific Congress of FAOPS is scheduled to be held in Kuala Lumpur, Malaysia, from the 23 to 26 September 2002. Two pre-congress workshops mainly focused on the teaching and learning of Physiology will be conducted in the week prior to the congress, from the 16 to 21 of August. This will include workshops on the use of computers and problem-based learning on the teaching and learning of physiology

The local and international scientific committees have drawn up an exciting program. During the 4-day congress a number of plenary and special lectures have been planned. Among the plenary lectures will be J. Robinson from Australia ("Fetal Origins of Fetal Disease"), S. Orrenius of the Karolinska Institute (Sweden) who will speak on "Mitochondrial Control of Cell Death", Ishwar Pahar (GnRH Neurons: Genes to Behavior) and Xiongli Yang who will talk on "Characterization of Amino Acid Receptors in the Retina." Aside from the plenary lectures daily special lectures by well known workers including Zhi-Qi Zhao (China), Bill Smaill (New Zealand) and Hsing-Ing Chen (Taiwan) have been scheduled.

A number of symposia have been planned. Many of the speakers for these symposia have been identified, and the list is being finalized. Information will be sent out and will be posted on the website soon. Symposia will include a wide variety of topics that may be of interest to a diverse group of participants. Among the symposium topics that have been identified are:

Cell signaling processes at the blood brain barrier
Endocrine disruptors and reproductive health
Neuro-endocrine mechanisms in stress
Trends in neuropeptide research
Ischemia and reperfusion
Molecular mechanisms of NaCl transport
Fetal Programming
Exercise and Heat
Growth and development of the kidney
Molecular and cellular physiology of mechano-sensitive channels
Natural antibodies in health and disease
Revisiting aldosterone in the cardiovascular system
The physiology of endothelium-derived vasodilation and its role in disease
Stem cells and cell differentiation
Learning and memory

A major proportion of one day will be used in a round table discussion plus symposium on strategies and methods in the teaching and learning of physiology in particular and life sciences in general.

The computer-aided learning workshop will be organized and conducted by R. Kemm. and Ann Sefton from Australia. This is scheduled to cover 4 days. The PBL workshop will be organized by David Kwan from MacMaster University in Canada, which is the birthplace of PBL. PBL as you may know is a technique of student-centered learning that is spreading over the world. It will cover the next 2 days of the pre-congress workshop.

There will ample opportunity for participants to present their papers and data in both oral and poster sessions. Topics covered are not restricted only to symposia titles but can cover any aspect of physiology or related sciences.

After much discussion it was agreed that the registration should be no more than US$200-250. We will endeavor to keep it to the lower end, and the local committee is now in negotiation with various quarters in order to keep the costs as low as possible so that we can pass on the savings to participants. We hope to have a firm figure very soon. Keep an eye on the web-site and any announcements we may make.

Coming to Malaysia is easy. If you look at the map it is somewhere in the canter of the Asia Pacific region. The gateway to Malaysia is the Kuala Lumpur International Airport, an ultra-modern facility outside of Kuala Lumpur. It has good airline connections from major hubs. It is well connected to the city by road, and in 2002 if all things go as scheduled there will be fast light rail link from KLIA to the Central Transport Facility (called as you might expect "Sentral") in the center of town. From Sentral one can catch some kind of public transport. You can check in at

Sentral and take the train hands free and luggage free to the airport.

Kuala Lumpur is well served by buses and taxis which can be hailed very easily. There are commuter trains and light rail transport which cover a large area of town. Food is plentiful and relatively cheap. Malaysia is a gourmet's paradise. There's Malay, Chinese, Indian, Japanese, Korean, Western – including even Russian- cuisine. You can get some kind of food at any time of the day or night. Most of Kuala Lumpur is relatively safe to walk around even in the wee hours of the day.

Kuala Lumpur is well - known for its Petronas Twin Towerkns (the tallest buildings in the world at the moment). Shopping malls and areas abound for those who love shopping. Prices are competitive with other parts of the region.

If there are children, they will find fun in some of the theme parks: including Sunway Water Park and Mines Wonderland. Further afield (about 1 hour by road or bus) there's Genting Highlands sitting on top the a hill, where the air is cool, a theme park to keep the kids busy, and for those who care to indulge, the only casino in Malaysia. Nearby are also the hill resorts of Fraser's Hill and Cameron Highlands and the sea resorts of Port Dickson and Pangkor Island..

There are many other places to visit and things to do: a marvelous highway will take to fascinating and beautiful Penang Island (about 400 km away) in more or less 4 hours. Then there's the historical town of Malacca, Putra Jaya the marvelous new administrative capital of Malaysia, parks and forest reserves such as Templer's Park, or if one is adventurous enough, a trek into the oldest rains forests in the world in the National Park could do it for you. Off the coasts are some of the best diving and snorkeling areas that you can find. There're then the East Malaysian states of Sarawak and Sabah which contain some of the most wonderful natural sites in the world: including the Mulu Caves, Mount Kinabalu (the highest peak in South East Asia and trekkable to the top) and the Kinabalu Park surrounding it, coral islands off the coast of Sabah surrounded by sparkling clear waters and fantastic coral reefs.

Malaysia is a nation where people are helpful and friendly. Generally people are hospitable to visitors especially. Entering the country will pose little problem for most visitors. Most do not even need to apply for a visa before they enter the country. A list of visa requirements will be posted on the website for your information.

Hope to see you next year in Malaysia. Don't forget to check our websites periodically at:
HYPERLINK "http://www.geocities.com" www.geocities.com/ HotSprings/ Spa/7550/faops
www.members.tripod.com/ ~tekam/faops/

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Physiology Teaching

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MEETING CALENDAR

NephroAsia 2001: Conquering Current Challenges in Nephrology
(International Meeting of National Kidney Foundation of Singapore, American Society of Nephrology, and American Nephrology Nurses' Association), Singapore.
June 13-16, 2001
Contact: National Kidney Foundation of Singapore
Tel: +65-299-0200
Fax: +65-299-3164
Email: nephroasia@nkfs.org
Internet: http://www.nephroasia.com

VII International Congress of Andrology
Motreal, Canada
June 15-19, 2001
Contact: VII International Congress of Andrology
74 New Montgomery, Suite 230
San Francisco, CA 94596
Fax: +1-925-472-5901
Email: asa@hp-assoc.com
Internet: http://www.isa2001.org, www.andrologysociety.com

Symposium of the International Society of Postural and Gait Research: Control of Posture and Gait
Maastricht, The Netherlands.
June 23-27, 2001
Contact: Organizing Secretariat, Conference Agency Limburg,
PO Box 1402
6201 BK Maastricht, The Netherlands
Tel: +31-043-361-9192
Fax: +31-043-361-9020
Email: cal.conferenceagency@wxs.nl
Internet: http://www.mbfys.kun.nl/ispg2001/

Fifth Biennial Meeting of the International Association of Medical Science Educators
Rochester, Minnesota, U.S.A.
July 21-24, 2001
Contact: Roger W. Koment, Ph.D.
President, IAMSE
Administrative Office
5535 Belfast Place, Suite A
Springfield, VA 22151 U.S.A.
Tel: +1-703-333-5223
Fax: +1-703-333-5224
Email: rkoment@iamse.org
Internet: http://www.iamse.org/conf5_menu.htm

American Physiological Society Conference 2001: Sodium/Calcium Exchange
Banff, Alberta, Canada
October 10-14 , 2001
Contact: APS Meeting Management Office
9650 Rockville Pike
Bethesda, MD 20814
Tel:+1- 301/530-7010
Fax:+1- 301/530-7014
Email: marcella@faseb.org
Internet: http://www.faseb.org/meetings

Asian-Pacific Symposium on Cardiac Pacing and Electrophysiology
Beijing, China.
October 13-16, 2001
Contact: Dr. Dayi Hu, MD
Secretariat General,
The 7th Asian-Pacific Symposium on Cardiac Pacing and Electrophysiology.
Email: heart@bme-cspe.org
Internet: http://www.apspe2001.org

15th Congress of Iranian Physiology and Pharmacology
Shiraz, Iran
November 5-8, 2001
Contact: Congress Secretariat: P.O. Box 71345/1363
Shiraz, Iran
Tel/Fax: +98-711-626-1001
Email: phypha15@sums.ac.ir
Internet: http://www.sums.ac.ir/~phypha15

4th International Congress and 8th Biennial Scientific Conference of Pakistan Physiological Society
Nishter Medical College Multan, Pakistan
April 2002
Contact: Assoc. Prof. M. Hamayun Ikram
Department of Physiology

Punjab Medical College Faisalabud
Pakistan
Tel: +92-041-721493, +92-041-543161
Fax: +92-041-761568
Email: hamayun 1@fsd.paknet.pk.com
Internet: http://www.geocities.com/pps45

4th FAOPS Congress
Kuala Lumpur, Malaysia
September 23-26, 2002
Contact: Prof. Swee Hung Cheah
Department of Physiology
Faculty of Medicine
University of Malaya
50603 Kuala Lumpur, Malaysia
Internet: http://www.geocities.com/HotSprings/Spa/7550/faops, www.members.tripod.com/~tekam/faops

4th HUGO Pacific Meeting and 5th Asia-Pacific Conference on Human Genetics
Pattaya (Chonburi), Thailand
October 27-30, 2002
Contact: Institute of Science and Technology for Research and Development
Mahidol University, Salaya Campus
25/25 Phutthamonthon 4 Rd., Salaya
Putthamonthon, Nakornpathom 73170
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Tel: +66-2-889-2557, +66-2-889-2558
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Email: grsfc@mahidol.ac.th
Internet: http://www.mu-st.net/hugothai

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Nayar, U., Ghaffar, T.A., and Lukowiak, K., The Objectives of Physiology teaching are no different in a PBL school as compared to traditional schools. Why then the resistance to change? IUPS Teaching Workshop, Repino, Russia, 1997.

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Physiology Teaching

Challenges of Teaching Physiology in a PBL School

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(Reproduced from Advances in Physiology Education 22; S140-S147, 1999: with permission from The American Physiological Society)

Abstract

Problem based learning (PBL) Curriculum was introduced at McMasters more than three decades ago. Not many schools have adopted the system despite its distinct advantages. The present paper examines the challenges of teaching physiology in a PBL curriculum and gleans through the literature supporting PBL. It appears that one of the reasons for PBL not becoming readily acceptable is the lack of concrete reports evaluating the curricular outcomes. The suggestion of Thomas (20) to standardize and internationalize all components of validated PBL curricula is quite valid. A database needs to be generated which can be easily accessed by traditional institutions for seeing the rationality and easy implementation of the PBL curriculum.

Educators all over the world are concerned that present day medical curriculum in most traditional schools is unable to cope with the ever changing health scenario with regard to health care needs, information overload and technical advancement. Problem based learning curriculum (PBL) has been projected as more dynamic and desirable. The philosophy, the logistics, the process, and hopefully the outcomes of medical education in a PBL curriculum are different as compared to those in a traditional school.

However, there are not many controlled studies to provide adequate database for traditional schools to opt for this change. One important study is that done by Albanese and Mitchell (1) who conducted a meta analysis type of review of the english language international literature from 1972-1992. Their findings suggest that PBL graduates as compared to graduates from a 'Traditional curricula' perform as well as, and sometimes better, on clinical examinations, and they are more likely to enter a family medicine program. PBL students, however, scored less well on basic science examinations, and viewed themselves as less well prepared in basic sciences than their conventionally trained counterparts. They were however better at application of knowledge though they knew fewer facts. Albano et al (2) found, based on the Masstricht progress test, that curricula which are different with respect to teaching methodology (e.g. integrated, problem-based versus disciplinary lecture based) yielded similar overall knowledge levels for final year students. Berkson (6) found that both PBL and 'traditional curricula' yielded comparable knowledge levels in undergraduates. When Kaufman & Mann (11) compared the attitudes towards basic sciences of students in a PBL and traditional lecture based curriculum at the end of their second year of a 6-year medical school program, they found that the PBL class had more positive attitudes towards the basic sciences than the traditionally taught students. These findings are consistent with the earlier studies (23,26).

The information-gathering type of medical curriculum, which we call the traditional curriculum, followed in most universities was based on recommendations arising from the Flexner report of 1910 (9). The 'bottomline' of this report was that a sound foundation in basic sciences was a pre-requisite for subsequent

clinical encounters.

The report had a salubrious effect on basic science departments; they flourished as never before and attracted many young enthusiastic scientists for research. An unforeseen byproduct of this was that in many universities teaching took a back seat as promotion committees found it easier to quantify research output than the teaching effectiveness or the quality of the 'end-product' (i.e. the graduated medical students). "Publish or perish" became the motto of basic scientists in the developed world. The developing world adopted the same curricular model, but lack of funds for research did not allow scientific advancement to the same extent.

By 1925 Flexner apparently was appalled (imagine what he might say today if he visited the research - intensive medical schools) by what had happened following the submission of his report. A good thing had been taken too far. The prescribed work for the medical students consumed the entire day and left no time to read, work or think. Despite his criticisms and pleas, even Flexner could not reverse a process he, more than any other, had set in motion (24).

In what has become the traditional curriculum, basic sciences are taught as discrete entities in the preclinical years of the program. Each discipline has its own logical structure and sequence. This is presumed to provide a solid foundation for the subsequent clinical study. However, it is common knowledge that the relevance and applicability of such basic science concepts are soon lost (13). As an 'antidote' to this situation a number of people attempted something new and started a Problem Based Learning (PBL) curriculum. PBL took its roots at McMaster University in the late 1960s and has since spread throughout North America, Europe, Australia and in some other parts of the world. Barrows (5) while advocating PBL, reiterated that the medical students we educate must acquire basic science knowledge that is better retained, better retrieved and better used in the clinical context.

How does the PBL curriculum differ from the 'traditional curriculum'? The PBL curriculum is based on a series of health problems. Each problem is presented with appropriate clinical triggers which encourage the students to pursue basic science information from various sources including but not limited to standard textbooks. The student 'feels the need to know'. The responsibility of learning is that of the student. The 'Teacher' becomes a facilitator of the process of learning.

The word 'Curriculum' in the traditional system simply meant the 'labelling of boxes in a grid' representing hours allocated to different disciplines for different types of teaching. This is spread over the fixed duration of the medical training program accounting for almost all the available working time.

Walton and Matthews (25) describing the origin of the word 'curriculum' have emphasized that 'curriculum' is more than a cluster of topics, just as a house is more than an assemblage of bricks and mortar. According to them, the 'bonding' and 'structure' are essential features of curricular construction. A medical curriculum which promotes self learning and contextual learning; that motivates the learner and focuses on the health care needs of society provides ample 'bonding' and 'structure'. The PBL curriculum appears to fit this description more adequately than the more traditional curriculum.

Why then are more medical schools not opting for this stream? What are the challenges? This paper is our distillation of the challenges of physiology teaching in a PBL school curriculum. These would aptly apply to all other basic sciences as well.

One of the authors (TA) has taught only at PBL school at AGU. The second author (KL) is well versed with teaching in various PBL schools world wide. The third author (UN) had spent three decades teaching in a traditional curriculum at the All India Institute of Medical Sciences, New Delhi, India and then joined the PBL school at College of Medicine, Arabian Gulf University. Together we examined the challenges facing the teaching of physiology in the PBL curriculum.

The major questions (or challenges) that we asked and seek to answer are as follows:
How much physiology? Who determines physiology objectives?
Are physiology objectives in a PBL curriculum different from traditional curriculum?
Does physiology get sufficient time to adequately 'explain' itself in the context of a problem?
What does integration mean anyway? Who decides what parts must be integrated?
Does the sequencing of problems pose a concern?
Is adequate weightage given to physiology in assessment?
Do students really learn physiology? Left to themselves, do they cover it well in sufficient depth with sufficient insight?
Are many basic physiology concepts lost?
Will physiology as a discipline survive in the next millennium? Will there be a 'critical mass' to allow it to continue to evolve?

These challenges are discussed below.

Who determines physiology objectives?

The clinician wants students to have enough knowledge of physiology which allows them to become competent physicians. The physiologists on the other hand want students to master many intellectual concepts as well as facts. In a traditional school, physiology curriculum is organised in a logical sequence from the molecular basis to the integrated whole. The depth of knowledge is usually determined by the bias of the faculty. On the whole, emphasis is to master basic concepts. It is expected that in the later years the students will recall and apply this knowledge to clinical situations. Decisions about the physiology content in a PBL curriculum on the other hand are driven by a group of faculty members from clinical and basic disciplines and the clinical problems selected by the school (8,19). At AGU the health problems are selected on the basis of certain criteria such as prevalence, interdisciplinary nature, context for problem solving, preventability, prototypicality, emergencies and conditions with emphasis on basic concepts (10).

The problems are grouped into units or blocks starting with the unit on 'Concepts and principles' proceeding with organ systems and finally multiple systems as the spiral grows. The development of a problem is a dynamic process where clinicians and basic scientists work as a team to ensure the flow of the problem, its logic, the appropriateness of triggers which help the students to identify their learning needs (the objectives). In this broad framework the specific learning objectives of physiology emerge. Rangachari (16) while discussing the implications of teaching physiology in a problem-based undergraduate course points out that PBL represents a dialogue between content and process i.e. 'What' is learned and 'how' it is learned? Therefore, in setting objectives for a PBL course it is important to include both 'process' & 'content'. Barrows (4) in his earlier study of the taxonomy of PBL described the educational objectives as divisible with structuring of knowledge for the development of critical reasoning process and use in clinical context.

In a traditional curriculum a hierarchical pattern is followed. The institutional objectives determine the departmental or intermediate objectives. Based on these the specific learning objectives are developed. The focus is on ensuring fundamental basic science concepts in minute detail. The broader application in clinical context remains in the background.

Are physiology objectives in a PBL curriculum different from traditional curriculum?

We have based many of our opinions on work experience (including written reports to national and international agencies) performed by us in many geographical regions under many different conditions. Included among these was an in-depth examination of the various disciplines (including physiology), their content, and how they are taught in the curricula in medical schools throughout India (22).

As far as we can determine, qualitatively there are no significant differences in either the content or the skills which a medical student is exposed to in a PBL vs. traditional medical curricula (14). The difference be-

tween the two curricula is in the process which is used to achieve the objectives. In a PBL curriculum, the learning is need-based, contextual, problem related and student-centered. There is no urgency to "stuff" or cram detailed information (much of which is not relevant anyway) into the students. Formal delivery of "resource sessions" which occurs in many PBL curricula (including AGU) imparts a conceptual framework, gives direction, leads the students both to the necessary and supplementary learning resources and leaves the students to sift the relevant from the redundant (etc) and then move on. In the traditional curriculum, on the other hand, the teacher or lecturer feels obliged to transfer all information obtained from the literature to the student. In this regard, the student and the lecturer in the traditional curriculum are not equal partners in the "learning game"; whilst in the PBL curricula they are. In fact, the responsibility for learning is shifted to the student.

A farming analogy may better help to illustrate the differences between the two curricula as follows. In a PBL program the soil is made fertile, the seed is then sown and hopefully the tree of knowledge grows and flourishes. In the traditional school the transfer of information is as if one were transplanting a full grown tree into relatively unprepared soil.

Does physiology get sufficient time to adequately 'explain' itself in the context of a problem ?

This is a difficult comparison to make because in a PBL school far more learning is done in tutorials and small group sessions on demand of the students. This is hidden time of the curriculum. However, since most traditional schools are accustomed to counting hours, a comparison has been made on the proportional formal resource time allocated to physiology for the Neuroscience course. Thus this is a very conservative estimate of the time allotted to physiology. In 1996-1997 from a total of 33 hours of resource time, 8 hours (approx. 24%) were allocated to physiology (Table I). This time constraint posed a great challenge and students found it hard to grasp the difficult neurophysiology concepts.

Table: I Time distribution for resource sessions in Unit VI "Central nervous system, Special senses and Human behaviour" at AGU.

Discipline	Resource Time (min)	Other activities/ variable time
Anatomy	320	Museum activities
Physiology	490	Lab and case studies
Clinical	600	Professional Clinical Skills
Pharmacology	160	Prescription writing
Pathology	60	Museum
Microbiology	20	Lab Review/ Questions session 330
Total	1980 (33 Hours)	

Note:- At AGU in 1996-1997, there were 11 problems in Unit VI and each problem gets resource and review time of 180 min. coming to a total of 1980 min. This does not include the small group teaching which is a continuous process.

To overcome this problem in 1997-1998, carefully designed case studies of lesions at different levels of neuraxis were presented to students during lab (10 hours). The students discussed them in small groups in the lab session and presented their analysis to the whole class. Similar comparative studies have been done in respect of other organ systems. The PBL system has a flexible curriculum with possibility and feasibility of midcourse correction.

In a traditional curriculum, the duration of the neurophysiology course varies widely. In a 'typical' traditional curriculum at All India Institute of Medical Sciences (AIIMS), the neurophysiology and special senses course is covered in about 33 lecture hours and about 20 lab hours, totalling 53 hours. An extensive neuroanatomy course is simultaneously given with attempts to integrate the two as far as possible.

If we compare the neurophysiology content in the two institutions, AGU & AIIMS (Table II), the formal neurophysiology course content at AGU is only about 25% of that given at AIIMS. AGU considers human behaviour a very important component of the unit which is not reflected in the AIIMS and other traditional curricula.

Table: II Time spent in teaching comparable components of Neurophysiology at AGU and AIIMS.

Intermediate objectives	AGU Time (min)	AIIMS Time (min)
-CSF and barrier mechanisms in brain	30	120
-Nerve impulse and synaptic transmission	80	240
-Spinal reflexes	30	120
-Sensory system	60	360
-Motor system	90	420
-Higher intellectual functions	110	300
-Special senses	90 *	420
Total	490	1980

(*Taste & smell not included)

What does integration mean anyway? Who decides what parts must be or not integrated?

In a traditional school efforts are made to integrate the curriculum in such a manner that anatomy precedes physiology and physiology precedes many pathological and clinical states subsequently. Horizontal and vertical integration at all times is a compromise and a half hearted attempt. The traditional curriculum timetable most often does not permit time flexibility to allow a proper integration. Boundaries are drawn and they are not easy to cross.

The student however, benefits most when the knowledge capsule on a particular disease aspect is presented as a whole, the different components being interwoven with each other. Such a blend is most easily achieved by utilizing a PBL curriculum.

Does the sequencing of problems pose a concern?

The traditional curriculum with an organ system approach is designed to lay down strong foundations in basic sciences as the complexity of function is logically built. The department determines the sequence as the course progresses from the cellular level to the integrated whole. In PBL, the approach though logical, cannot be sequenced in the above manner, e.g. you may be required to teach all about the heart when students have no clue of the properties of excitable tissue. Similarly, one may have to teach reproduction without any prior knowledge either of the endocrines or the nervous system. Theoretically nothing is wrong with this except that it poses a great challenge to the facilitator and resource person. Students in PBL, have to 'trust' that the necessary details will come later or they have to review their basic concepts and principles which they earlier learned and apply it to the new situation. The learning progresses in a spiral fashion. This kind of learning is more akin to real life situations which do not appear in any logical sequence anyway. Students have a better diagnostic reasoning.

Is adequate weightage given to physiology assessment?

It is common knowledge that the assessment system is one of the foremost determinants of the students' learning behaviour. In a PBL curriculum, teaching is integrated and efforts are made to have assessment in an integrated manner. The instruments of assessment are the same. At AGU the patient management problems (PMPs), short answer questions (SAQs), and multiple choice questions (MCQs) constitute the theory paper. The clinical and practical skills are tested by objective structured exams - the OSCE and OSPE, respectively.

The content of the examination in many PBL schools including AGU is most often determined by the co-ordinator of the block or unit in consultation with the members of the unit committee, many of whom are resource persons for that particular block or unit. The question paper carries items which are objective oriented. Discipline identification is not totally lost because weightage is proportional to Resource times. However, at the end of each examination both the students and faculty have a feeling of an inadequate weightage being given to a particular discipline. Such a dilemma is not encountered in a traditional school where each discipline has an opportunity to test appropriately in all aspects of the subject. However, even there complaints about certain aspects of the curricular content not being tested abound. It is also true that the amount of detailed knowledge tested in a traditional curriculum is far too much from the subsequent retrieval and application point of view. The limitation is overcome in the integrated PBL assessment which ensures not to loose sight of the most relevant and applicable aspects.

Do students really learn physiology? Left to themselves do they cover it well, in sufficient depth with sufficient insight?

Time has come when the physiologists have to be willing to "let go". The physiologists in a PBL school often feel that students are not learning their subject as well as they ought to do, specially in depth. The role of guide-tutor assumes critical significance to take the students through the relevant realms of the diseases, and carry out in-depth study. The students may only carry superficial knowledge of an aspect of physiology which underlies the problem being studied. As physiologists we have seen that we often must supply a lot more background information to the students to enable them to arrive at a point where they can begin to appreciate the physiological concept. This can be time consuming and at the same time almost counter productive. It is counter productive in that the students did not identify the need themselves, but the faculty did. Thus, the learning which should have come as a result of an active process instead becomes the passive acceptance of someone else's thoughts. The importance of knowledge in clinical competence and problem solving (17) and also within the context of problem-based learning (15) has been well documented. The progress test developed at Masstricht has been in vogue for fifteen years for sampling knowledge across all content areas of medicine reflecting the end objectives of the curriculum (21). This test format has also been adopted at McMaster Medical School, as an addition to the tutor evaluation of students (7, 12).

Progress test for assessing knowledge base in a PBL school seems to be a good indicator of the progress and quality of the finished product of the medical school and can be used for comparing other diverse educational programmes. A similar longitudinal testing procedure has been developed at the University of Missouri Kansas city (3).

In order to have documentary evidence of the changing knowledge base as the students go through the spiral problem-based curriculum it is imperative that some method of longitudinal progress testing be adopted in every PBL school. This may also allay some of the concerns of the basic science faculties as to what actually is being learnt and more importantly applied and remembered. Can knowledge of a physiological principle be transferred to a new clinical situation? That is, are the students able not only to remember the principle in the context of the problem in which it was presented but are also able to apply the principle as concept to answer a question in a novel situation or any other problem? That maybe the most important question to ask.

Are many physiology concepts lost?

The answer to this question depends upon the background of the person examining the curriculum. For a neurophysiologist the concepts of synaptic transmission and information processing in the nervous system are the pre-requisites for understanding the nervous system. In a PBL set up this may get only contextual treatment and important (at least to the neurophysiology) details may be ignored. Similarly a respiratory physiologist may not be satisfied till the detailed dynamics of gas exchange at alveolocapillary membrane are considered. A cardiovascular physiologist would like the hemodynamic principles to be properly emphasized. There is therefore, no doubt that as compared to a traditional school, in a PBL school many basic concepts in physiology and other basic disciplines do not receive adequate coverage - a phenomenon which may well have gone on unnoticed and be quite prevalent in traditional schools too.

Will physiology as a discipline survive in the next millennium? Will there be a 'critical mass' to allow it to continue to evolve?

What kind of effects PBL schools will have in the long term on the behaviour of the physicians as well as future physiology teachers remains to be seen. There is a possibility that the pendulum may swing in the opposite direction. Physiologists may not be required to do the physiology teaching. The physician himself may take up the onus of teaching relevant physiology. This may already be happening with the discipline of anatomy both in traditional or PBL curriculum where surgical anatomy is taught by surgeons and radiographic anatomy by radiologists - a trait which was dominant in the beginning of this century before Flexner era. In a hundred years then we would have gone a full circle.

The past century has often witnessed a symbiotic relationship between clinicians and basic scientists leading to the evolution of a breed of good clinical scientists. Schrier (18) examined the various forces threatening the survival of this very clinical scientist as an academic species. He fears that if corrective steps are not taken, the clinician scientists will become a vanished breed in medicine. Academic health science centres will merely become clinics for the clinical departments and research institutions for the basic science departments. He moans that this will be a tragedy, particularly at a time when the opportunities have never been better to bring exciting basic research to the bedside and perform important outcome and cost effective research. PBL schools should ordinarily be a perfect environment for basic scientists and clinicians to cross fertilize their thoughts strengthening the scientific thought and scientific inquiry from bench to bedside and vice versa.

Perspective

Barrows (4) proposed that four key objectives can be achieved in the education of doctors through problem-based learning: Motivating learning; Developing clinical reasoning; Structuring knowledge in clinical context, and Developing self-learning skills.

Eleven years later Thomas (20) has examined the qualitative evidence whether the four key objectives proposed by Barrow (4) for PBL were achieved in medical schools that use the PBL format. According to his extensive literature search till 1995, he found only three studies of outcomes for patients treated by doctors trained with PBL problems. This has always been the concern of people who wish to adopt PBL but do not find concrete reports evaluating the curricular outcomes. Thomas (20) has proposed that four methods of improving PBL curricula would be to derive nationally and internationally accepted PBL curricula; to organize internationally accepted psychometrically validated methods of evaluation; to develop attitudes among students and tutors to facilitate co-operative PBL team work; and to teach group process diagnostic skills. If we want PBL or its improved version to gain universal acceptance, time has come for concerted efforts by PBL institutions to launch a joint global project, devise common instruments on the lines proposed by Thomas (20), generate a database, disseminate the information so that it can provide spring board for action to the medical institutions.

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News from Societies
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Japanese Physiological Society, and simultaneously to attract the member people who were not attended at the meeting recently, and the non-member researchers in life sciences and students. Over 100 non-member participants made presentations in this meeting.

One plenary lecture I attended was presented by Prof. Tetsuro Matsuzawa about the Culture and Intelligence of Chimpanzee. Prof. Matsuzawa is a primate researcher and is well known by a series of reports about female chimpanzee named AI. Through the field works and experiments basing on the environmental research ground constructed in the Primate Research Institute, Kyoto University, Prof. Matsuzawa demonstrated how chimpanzees learn to utilize tools and how they let the young fellows to learn the elders $B!G (B technique. It was impressive to know the patience of Prof. Matsuzawa in these investigations. I am also impressed by knowing how adult chimpanzees educate young fellows. They were so warm hearted and patient to let the younger fellow to imitate, repeat and learn their skills. Other plenary lectures were about regeneration of nerves by Prof. K. Yoshizato from Hiroshima University, computer cells by Prof.M. Tomita from Keio University, and constructive cell biology by Prof. K. Kaneko from Tokyo University and related panel discussions.

The meeting site Doshisha Univ. was close to the imperial garden of Kyoto, and cherry trees were just started to have flowers a few days ahead of the meeting. These situations of the campus and the weather might have encouraged such a large number of people to come to this meeting. As a member of the program committee I summarize that the meeting attracted so many people and presentations, and was active and successful.

The 30th Annual Meeting of the Physiological Society of Thailand (PST)

by C. Pholpramool

PST had its recent annual meeting from May 2-4 in Songkla, the non-sleeping southern city of Thailand. The meeting highlighted the regional cooperative program so called “The Indonesia-Malaysia-Thailand Growth Triangle” (IMT-GT). The Ouay Ketusingh Lecture was delivered by Prof. Tada Yipintsoi, a renowned cardiologist at Songklanakarin University, on the fractal property of regional blood flow in dog heart. A symposium session was devoted to “IMT-GT Research in Physiology”. Speakers were from three neighboring countries in ASEAN. Assoc. Prof. Harbindar Jeet Singh from Universiti Sains Malaysia, the former member of FAOPS Council, provided recent evidence for the pathogenesis of pre-eclamsia. Dr. Abdul Madjid from University of North Sumatra, Indonesia discussed the importance of diastolic function in normal and pathologic heart. Dr. Chaweewan Jansakul from Songklanakarin University, Thailand, reported her work on the effects of exercise training on adrenergic responses of various vascular beds in rats whilst Dr. Apichai Shuprisha from the same university illustrated his ingenious method for real time measurement of luminal efflux of Jittima Verachayaphorn, fluorescent organic compounds in the proximal tubules. Two graduate students, Ms. Jittima Verachayaphorn and Patchanee Sukserm, both from the Faculty of Science Mahidol Uinversity, received, respectively, Dithi Chungchareon and Prasop Ratanakorn awards for their outstanding oral presentations.

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News from Societies

A New Institute of Neurobiology Is Found in China

by Bao-Ming Li

The Institute of Neurobiology, Fudan University, China, was founded in July, 2000. The Institute works towards understanding the mechanisms underlying synaptic transmission and modulation, sensory information processing, and learning and memory. The present director of the Institute is Professor Xiong-Li Yang, who is the member of the Chinese Academy of Sciences, the President of the Chinese Association of Physiological Sciences (CAPS), and the Vice-President of FAOPS,. The Institute currently consists of the following three units.

1. Unit of retina research

The unit focuses on the study of the mechanisms underlying transmission and modulation of photoreceptor signals in the retina, using electrophysiological, immunohisto-chemical and pharmacological approaches. The on-going projects are as follows: 1) characterization of glutamate receptors on horizontal and amacrine cells; 2) distribution and function of $GABA_A$ and $GABA_C$ receptors on bipolar cells; 3) characterization of GABA and glycine receptors on bipolar and amacrine cells, interaction between these two receptors and modulation by Ca^{2+}, Zn^{2+} and melatonin of these receptors; 4) Modulation by Zn^{2+} of rod and cone signal pathways; 5) Expression and functions of glutamate and GABA transporters on retinal neuronal and glial elements. This unit is chaired by Prof. Xiong-Li Yang.

2. Unit of pain research

The unit consists of the 3 in vivo and 4 in vitro electrophysiological laboratories, the behavioral laboratory and the chemical anatomy laboratory. The aim of the study is explore the cellular and molecular mechanisms underlying the plastic changes in peripheral nociceptor and spinal neurons produced by chronic pain. The main studies focus on the synaptic structure, neurotransmitter (particularly, glutamate and substance P) and their receptor expression, synaptic transmission and intracellular signal transduction in the spinal pain pathway, as well as the interfering and inhibiting mechanism of spinal transmission of nociceptive information. The ultimate purpose is to explore effective strategy of pain control and develop specific analgesics, but also to improve our understanding the central sensory mechanism. This unit is chaired by Prof. Zhi-Qi Zhao.

3. Unit of learning and memory research

The unit aims at understanding the neural mechanisms underlying learning and memory by using electrophysiological, neuropharmacological and behavioral techniques. Currently, its efforts are devoted to studying the role of prefrontal cortical α_2-adrenoceptors in working memory and behavioral inhibition, the role of the ventral prefrontal cortex in visuomotor associative learning, and the role of hippocampal novel genes in learning and memory. Experiments are conducted in rats and monkeys. Unit head is Prof. Bao-Ming Li

78th Annual Meeting of Japanese Physiological Society at Kyoto:March 29-31, 2001.

by H.Ohmori, Kyoto University

Japanese Physiological Society held 78th annual meeting in the campus of Doshisha University Kyoto, from 29 to 31 March 2001. The meeting had 4 plenary lectures, 66 symposia, about 700 poster presentations and exhibitions of scientific instruments and books. Over 2000 people registered and over 1000 presentations were made in both symposium and poster. For the first time of JPS meeting history all registrations were made electronically through the internet. Meeting information was made public on the web site in both Japanese and English. The English site was still preliminary but we wish it has been helpful for oversea participants.

Symposia were distributed in the wide field of Physiological Sciences. In each symposium chair persons organized 3-4 invited talks and a few more talks selected from applications. Some symposia were organized by chair persons who were not even the member of Japanese Physiological Society. We have encouraged them to participate this meeting in order to expand the scientific ground covered by the

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