

AMERICAN PHYSIOLOGICAL SOCIETY
CELL & MOLECULAR SECTION NEWSLETTER

FALL, 2003

CHAIR'S MESSAGE

Teaching Cell Physiology

Nearly all the activities of the Cell and Molecular Section of APS are centered on research, because research is of premier importance to the Society and the Section. However, most members of the Section work in universities, and teaching is also an important part of our jobs. Those of us in a medical school Department of Physiology very likely teach Cell Physiology to medical students, either in a Cell Biology course or as part of Medical Physiology. I've just finished a block of lectures to medical students on ion transport and regulation. In giving these lectures, I was struck by how easy (compared with 20 years ago) it is to convince medical students of the importance of understanding channels, transporters, and signal transduction pathways, because there are now so many examples of human disease that involve membranes and the regulation of ions and small solutes. The relevance of cell physiology to medical education is of course not limited to ion transport; in every section of our Medical Physiology course, it is now possible to talk in much more specific terms about cellular mechanisms than was possible only a few years ago.

The rising importance of Cell Physiology in the curriculum for medical students and graduate students represents an opportunity and challenge to members of our Section. There are of course many enduring principles of Cell Physiology that have not changed appreciably and remain the foundations of our discipline, and we must continue to make sure our students understand these principles. But now we know the identities and some aspects of the functions of hundreds of proteins that ultimately have a role in cellular homeostasis and specialized functions of cells. It is a challenge to keep up with all these advances in relation to our research programs, and it is even more of a challenge to ensure that our teaching of Cell Physiology reflects the current state of knowledge.

I want to alert members of our Section to an important event that provides us an opportunity to enhance our skills in teaching Cell Physiology. The Education Committee of APS is holding a Refresher Course in Cellular Homeostasis at the Experimental Biology 2004 meeting in Washington, D.C. Michael Romero of the Department of Physiology and Biophysics at Case Western Reserve University is organizing the course. The current plan is to hold the course on Friday, April 16, 2004, which is the day before the official beginning of EB. A detailed schedule will be available later this fall. I urge members of our Section to make a special effort to attend this Refresher Course, which will not only update our skills in teaching classical concepts but also help us incorporate into our teaching materials the spectacular recent advances in our understanding of the molecular basis of cell function.

This is my third and final year as Chair of the Cell and Molecular Section, and I want to express my appreciation to all the members of the Steering Committee and especially to Vice Chairs Martha O'Donnell (2001-2002) and Carole Liedtke (2002-2005) for being such good

partners in carrying out the business of the Section. Special thanks, too, to Bob Gunn, who has been an outstanding Sage over the past 2 ½ years. This winter we will have elections for a new Chair as well as replacements for members of the Steering Committee, as described later in this Newsletter. We have an excellent Section that occupies a unique niche in the APS because our interests span so many other Sections. The continued success of the Cell and Molecular Section depends on the enthusiasm and commitment of our membership; an important way to help guide the future of the Section is to participate fully, as nominators, nominees, and voters, in the upcoming elections.

Michael L. Jennings
Chair, APS Cell and Molecular Physiology Section

ELECTIONS ELECTIONS ELECTIONS

Now is the time to become active in the Cell and Molecular Physiology Section! The Steering committee requests nominations from the Cell Section membership for positions of Chair and two Councilors. The Chair serves a three year term. The Chair calls and chairs Section meetings, supervises elections in coordination with the Vice-Chair, appoints committees, selects the Distinguished Lecturer, writes a column for the Section newsletter, serves as Section Advisory Committee (SAC) representative and submits a Section report to the SAC chair each year. One Councilor will serve a term of three years as representative of the Cell and Molecular Physiology Section on the Committee of Committees. Responsibilities of this Councilor include soliciting nominations for committee vacancies, obtaining advice of the Cell and Molecular Physiology Steering Committee on candidates and meeting with the Committee of Committees at the Experimental Biology meeting to finalize a slate of candidates for committee vacancies. A second Councilor will serve a term of two years and have general responsibilities as designated by the Chair and Steering committee.

Section members can nominate others or themselves. Nominations are due no later than November 15, 2003 to Chair Michael Jennings (jenningsmichaell@exchange.uams.edu) or Vice-Chair Carole M. Liedtke (CXL7@CASE.EDU).

EXPERIMENTAL BIOLOGY 2004

Deadline for Abstracts: November 12, 2003

Abstract-based awards are available for junior faculty, postdoctoral fellows and students. All that's needed is an application, following the requirements for each award. Awards include the Cell and Molecular New Investigator Award, Young Investigator Awards (2), and Student Awards (2), Caroleine tum uden Professional Opportunity Award, and the Procter & Gamble Professional Opportunity Award.

More details can be found by following the links, or by going to the "Awards" section of the APS homepage.

Caroline tum Suden Profesional Opportunity Award and Proctor and Gamble Profesional Opportunity (EB abstract Deadline)
<http://www.the-aps.org/awards/student.htm>

Lazaro Mandel Young Investigator Award
<http://www.the-aps.org/awards/society.htm>

Predocctoral and Postdoctoral Student Awards (EB abstract Deadline)
<http://www.the-aps.org/awards/student.htm>

APS and FASEB also offer awards to young (Bowditch) and experienced scientists (Cannon and Excellence in Science) and to mentors (Distinguished Mentoring Award). We encourage Cell and Molecular Physiology Section members to submit nominations for these awards.

Cannon (Ocober 1 Deadline) and Bowditch (October 1, Deadline),
<http://www.the-aps.org/awards/society.htm>

FASEB Excellence in Science (March 1, 2004 Deadline)
<http://www.the-aps.org/awards/other/faseb.htm>

Bodil M. Schmidt-Nielsen Distinguished Mentor and Scientist Award (October 1 deadline)
<http://www.the-aps.org/awards/society/schmidt-nielsen.htm>

Thanks to Cell Section Councilor John Cuppoletti for this information.

SESSIONS SPONSORED BY THE CELL AND MOLECULAR SECTION

Physiology in Focus: Large Scale Systems Biology

Hugh Davson Distinguished Lectureship of the APS Cell & Molecular Physiology Section
Peter Agre, Monday, 4/19/04, 8:00-9:00 am

*The Members of Cell and Molecular Section of APS were delighted to learn October 9 that Peter Agre will share this year's **Nobel Prize in Chemistry** for his work on aquaporins. We extend our warm congratulations to Dr. Agre and look forward very much to his Davson Distinguished Lecture at EB2004*

Cell Section Sponsored Symposia

Wednesday, 4/21/04 8:00-10:00 am
Organizer: K.E. Conley,

Mitochondrial Function in Aging and Disease

Tuesday, 4/20/04 8:00-10:00 am

Regulation of Vascular Tone and Permeability, Organizer: M.J. Davis

The Role of Integrins in Vascular Cell Signaling and

Cell Section Sponsored FEATURED TOPICS*

Sunday, 4/18/04 8:00-10:00 am
Organizer: R.J. Paul

Rho and Rho Associate Kinase Pathways

Sunday, 4/18/04 10:30 AM-12:30 pm

Organizers: P. Bounelis and R.B. Marchase

Capacitative Calcium Entry

Tuesday, 4/20/04 8:00-10:00 am

Cellular Function in Mammalian Cells, Organizer: R. Martinez-Zaguilan

Vacuolar Type H⁺ - ATPases: Structure and

**Note: If you would like your abstract considered for a talk in one of these Featured Topics, be certain to check the appropriate box for the session on the abstract submission page in the Call for Abstracts booklet.*

Cross Sectional Symposia

Intracellular Trafficking of Membrane Proteins in Renal Epithelia

Paul A. Welling and Michael Caplan

The Mechanisms and Impact of Fetal Physiological Programming, J. Schwartz

Other Symposia of Interest

The TRP Superfamily of Cation Channels: Emerging Roles in Epithelial Physiology

Peter R. Smith

Store-Operated Calcium Channels and Control of Muscle Contraction, Jianjie Ma

New Genomic Technologies for Systems Biology, Anne Kwitek

Microarrays, Proteomics and Mass Spectrometry, Susan Olds

Biological Applications of Nanotechnology, Jahar Bhattacharya

Claudin Expression and Function in the Kidney, R.C. Harris

Stem Cells and Progenitors Cells: Biology, Physiology, and Therapeutic Applications, K. March

Stem Cells of the Developing and Adult Lung, Claudette M St. Croix and Barry R. Stripp

Stem Cells: The State of the Progenitor, Meredith Hawkins

Ischemic Injury, Abdulla Salahudeen

Metalloproteinase and Diabetes, Suresh C. Tyagi

Other Feature Topics of Interest

Epithelial Na and K Channels, Larry G. Palmer

Spectrum of Ion Channels in Alveolar Epithelial Cells: Implications in Alveolar Fluid Balance and Cell Volume Regulation, K.J. Kim

Regulation of Intestinal Ion and Vitamin Transporters During Development, Mrinalini C. Rao

Cell-Cell Contacts in Regulating Lung Function, M. Koval

Molecular Physiology of Oxygen Homeostasis: Oxygen-Dependent Hydroxylation

Sukhamay Lahiri

Membrane Traffic in Epithelial Cells, Kevin L. Kirk

Comparative Regulation of Renal and Intestinal Protein processing and Transport: From Molecules to Environment. Andreas Werner and Shozo H. Sugiura

Teaching Refresher Course.

Cellular Homeostasis, Moderator: Mike Romero. Speakers: Steven Wright, Walter F. Boron and two speakers TBA

Workshops and Special Symposia:

Making Science News: A Journalists Roundtable, sponsored by Public Affairs Committee

Life After the Ph.D.: Finding a Postdoctoral Fellowship, sponsored by Women in Physiology Committee

Collaboration: The Cornerstone of Science, Learning and Change, sponsored by the Teaching Section

Planning a Successful Postdoctoral Experience: A Proactive Approach, sponsored by the Careers Committee

A Bioinformatics How-to for the Wet-Lab Physiologists

EB2004 Distinguished Lecturers

Robert M. Berne Distinguished Lectureship, Cardiovascular Section	Gary Owens	Molecular Control of Smooth Muscle Differentiation in Vascular Development and Disease
Hugh Davson Distinguished Lectureship, Cell & Molecular Physiology Section	Peter Agre	Aquaporin Water Channels at the Convergence of Physiology and Medicine
Joseph Erlanger Distinguished Lectureship, Central Nervous System Section	Paul Greengard	Signal Integration in the Central Nervous System
August Krogh Distinguished Lectureship, Comparative Physiology Section	William Dantzler	A Vertebrate Renal Odyssey-Organic Solute Excretion and Water Conservation in Reptiles, Birds, and Mammals
Solomon A. Berson Distinguished Lectureship, Endocrinology & Metabolism Section	Bert O'Malley	New Aspects of Steroid Receptor and Coactivator Function in Reproductive Tissues
Edward F. Adolph Distinguished Lectureship of the APS Environmental & Exercise Physiology Section	Reggie Edgerton	Tentative: Evidence for and Possible Mechanisms of Learning in the Spinal Cord of Mammals
Horace W. Davenport Distinguished Lectureship, Gastrointestinal Section	John Forte	
Carl Ludwig Distinguished Lectureship, Neural Control & Autonomic Regulation Section	Cliff Saper	
Carl W. Gottschalk Distinguished Lectureship, Renal Section	Thomas Jentsch	Chloride Transport in the Kidney: Insights from Mouse Models and Human Disease
Julius H. Comroe, Jr. Distinguished Lectureship, Respiration Section	Jerome Dempsey	Crossing the Apneic Threshold: Causes and Consequences. lecture will be followed by abstract presentations
Claude Bernard Distinguished Lectureship, Teaching of Physiology Section	Harold Modell	Evolution of an Educator: Lessons Learned and Challenges Ahead

Submitted by Program Officers Ron Lynch and John Payne

GET ACTIVE, STAY ACTIVE IN APS

The new streamlined nomination procedure is a remarkable improvement! The Committee on Committees found that the self nomination form and single recommendation provided more relevant information than ever before. The only limiting factor was the number of candidates from all sections, attributed to unfamiliarity with the new process. Most candidates who put their names in early and were flexible about committee assignment were placed on committees.

Congratulations are extended to the following Cell Section members who were appointed to terms commencing 2004: Peter Friedman on Awards, Michael Romero on Communications (Marshall Montrose as alternate), Kathleen Morgan on Finance, Paul Welling (alternante) on Long-Range Planning, Robert Robey on Membership, Norma Adragna on Perkins Fellowship, Margaret Colden-Stanfield (alternate) on Porter Physiology Development, Michael Portman on Public Affairs, and Peter Lauf on Senior Physiologist. Alternates this year will be top on the list for regular membership next year so be sure to re-nominate yourself.

We need candidates! While the Cell Section is well represented on most committees, we are losing Cell reps after 2004 and need to identify new candidates. Please review the openings, the committee charge and consider nominating yourself to one of the committees listed below. Not included are committees in which there is more than one Cell rep after 2004; *those in italics will have no Cell reps after 2004.* Go to: <http://www.the-aps.org/committees/> for information about committees and for the Nomination forms.

Animal Care and Experimentation - two openings, no Cell reps

Ray G. Daggs Award – three openings, no Cell reps

Finance – two openings on 4 member committee, one new Cell rep.

International Physiology - two openings, no Cell rep after 2004

Long Range Planning - committee composed of one past president, senior, junior members. Three openings.

Membership - two openings, one Cell rep

Perkins Memorial – two openings, one Cell rep

Porter Physiology Development - two openings.

Public Affairs - two openings, one Cell rep

Publications - three openings, no Cell rep after 2004.

Senior Physiologists – two openings, one Cell rep

Women in Physiology – three openings, no Cell reps after 2004

FASEB committees – *Excellence in Science, Finance, AAAS all have openings and no Cell reps.*

Get involved and make a difference!

The APS is composed of a set of interesting and important decision making committees. Right now nominations are being solicited for terms that begin in 2005. These Committees are looking for a mixture of talent from students to junior to senior Physiologists, from both universities and industry. The experience is most rewarding as you learn, contribute, and meet Physiologists with diverse backgrounds from all parts of the USA and the world. The **Cell and Molecular Physiology section** can only impact APS if we are represented. Now, any APS member wishing to be a candidate for a committee position will submit a Candidate Information Form, and have **one** Endorsement Form submitted on his or her behalf. This allows for the standardization of the type of information required from a candidate, and the number of supporting nominations submitted. Forms should be submitted only via email to nominations@the-aps.org. **The deadline for submitting the forms is January 15, 2003 for 2004 committee appointments, but please submit earlier.** Questions concerning the nomination process can be directed to Linda Jean Dresser, Executive Assistant, at ldresser@the-aps.org. Finally, please inform the Cell and Molecular Section representative, Alicia McDonough at mcdonoug@hsc.usc.edu of your application so she can be an advocate for Cell candidates.

Submitted by Committee on Committees Representative, Alicia McDonough

APS and CELL SECTION TRAINEE REPRESENTATION

A new day of trainee representation is dawning at APS. A Trainee Advisory Committee (TAC) has been created in accordance with recommendations of the APS Task Force on Trainees. The TAC is composed of trainee representatives from each of the Society's disciplinary sections and will be meeting at least annually at EB. The goal of the TAC is to serve both pre-and post- doctoral trainees by increasing their involvement in APS and providing

support and assistance in various forms. You can expect to see a new trainee newsletter, increased programming at EB, and a new web page on the APS home page targeted to trainee needs. To ensure the interests of all CAMPS members are considered by the TAC, our own CAMPS Task force on Trainees is compiling a survey, which will be sent out by listserv. Or send comments directly to caroline.sussman@case.edu. Please let us know your gripes (how often do you get that offer?). We'll be sure to bring your issues to bear at the next TAC meeting.

Submitted by Postdoctoral Representative Caroline Sussman

A NOTE FROM THE CELL SECTION SAGE

The Sage should, after three years, have something wise to say to the Section, but for the life of me, which as many of you may know was not very much during the past 10 months, I can't bring any wisdom to the table. Although the death rate remains at one per person despite of all our medical research, it is not this verity that has struck me very hard during my recent illness, six rounds of chemotherapy and the final assault before my bone marrow transplant on 22 May 03. But rather the amazing importance of friends who by repeated contact and sometimes exceptional demonstrations of good will and caring interacted with me to keep my spirits up and bring me to this happy state of remission. (I believe that there have been many prayers working unbeknownst to me.) Given the constant death rate, it is not the certainty of the final event but the manner of that event, the exit strategy, which has become important. Now for me as with most of you, good health seems to make many things important that were inconsequential during illness and the idea of an exit strategy seems silly. However, the one element that has remained with me is that the good fight is really all that one should plan to effect. Sudden tragedies notwithstanding we will have some skirmishes before the final battle and we should do those in the best style we can. It is like that grant that you just can't get renewed either because it is still ill-conceived or because "science" has moved on to what seems to be less important questions, you must close it out and publish the results even if they aren't conclusive. Hopefully someone will read that paper and recognize that there was careful thought and that if they had done the experiments as they were described they too would have gotten those crazy results. And more hopefully that someone will design and perform a better set of experiments to settle the issue. So the experiments will end, though I'm not to that point yet, but the new ideas (here read "grant writing") and the published papers and the trainees live on beyond the experiments. Cell physiology is truly coming into its own. While we move to understand functions in terms of signaling pathways, transporters and the assemblies of membrane proteins, our colleagues are using old cell physiology (of 10 or more years ago) in their systems and organ physiology. What a lucky group we are to be out in front where the air is clear and we can work with all the cards on the table face up so as to give ideas away that might entice others to adopt them and do the necessary experiments.

Submitted by Cell Section Sage Robert Gunn

AJP CELL PHYSIOLOGY - A FALL MESSAGE FROM THE EDITOR

I am delighted by the positive response of many of you to my previous Newsletter article, in which I asked for you to submit your best work to AJP Cell Physiology. We have received many original submissions from "Cell" section members, and importantly, the number of articles submitted by editorial board members has shown a dramatic increase in the past 3-4 months. These submissions encompass the whole range of topics covered by the journal. We are always looking for more original manuscripts of course, and we are always keen to discuss topics for invited reviews. So, at this time of active grant writing, why not convert the background section of your NIH application into a review for AJP Cell Physiology? This way, you can be sure that something positive will emerge from your efforts, even if NIH fails to see the considerable merits of your application!! Contact me directly at ajpcell@rcn.com (or any of the Associate Editors) with any suggestions.

I would like to use this Newsletter to draw attention to two features of the AJP Cell Physiology website (<http://ajpcell.physiology.org>) that provide important information for potential authors, published authors and editors. These are the "50 Most Frequently Cited Contents" and "50 Most Frequently Read Contents" lists. These lists provide information, updated every month, on AJP Cell Physiology articles that fall into these categories. For an editor, this provides critical information on the long-term and short-term impact areas of the journal. The Most Cited list clearly shows the long half life of AJP Cell Physiology articles, while the Most Read list indicates what is of current interest to our readership. The data show that as expected, the topic range is remarkably broad, but the emphasis on ion transport and signaling in various cell types is clear. The following are the top 5 articles in each list as posted through the end of August 2003.

Most Frequently Read in August 2003 (i. e., accessed on the AJP Cell Physiology website)

- 1) **Boo and Jo**, *Flow dependent regulation of endothelial nitric oxide synthase: role of protein kinases* (285: 499-508, 2003)
- 2) **Frizzell and Bertrand**, *The role of regulated CFTR trafficking in epithelial secretion* (285: 1-18, 2003)
- 3) **Di Ciano-Oliveira et al.**, *Hyperosmotic stress activates Rho: differential involvement in Rho kinase-dependent MLC phosphorylation and NKCC activation* (285: 555-566, 2003)
- 4) **Duman and Forte**, *What is the role of SNARE proteins in membrane fusion?* (285: 237-249, 2003)
- 5) **Eggermont**, *Rho's role in cell volume: sensing, strutting or signalling?* (285: 509-511, 2003)
(This is an Editorial Focus article on DiCiano-Oliveira et al - number 3 in the list)

Most Frequently Cited (obviously these articles are older than those on the list above)

1. **Beckman and Koppenol**, *Nitric oxide, superoxide and peroxynitrite: the good, the bad and the ugly* (271: 1424-1437, 1996)
2. **Nelson and Quayle**, *Physiological roles and properties of potassium channels in arterial smooth muscle* (268: 799-606, 1995)
3. **Dubyak and El-Moatassim**, *Signal transduction via P2-purinergic receptors for extracellular ATP and other nucleotides* (265, 577-606. 1993)
4. **Nelson et al.**, *Calcium channels, potassium channels, and voltage dependence of arterial smooth muscle tone* (259, 3-18, 1990)

5. **Gunter and Pfeiffer**, *Mechanisms by which mitochondria transport calcium* (258, 755-786, 1990)

The strength of AJP Cell Physiology in the domain of many aspects of cell signaling is evident from a more in depth reading of these Top 50 lists. I urge you all to visit the AJP Cell Physiology website and peruse this information. In addition, I remind you that the "Legacy" effort to archive all of the past AJP Cell Physiology volumes is well under way, and articles dating back to 1977 are now available online. This remarkably rich source of information is an outstanding resource that is provided free-of-charge by the APS for the entire scientific community.

Thank you all for supporting AJP Cell Physiology during my first year as the Editor-in-Chief. I look forward to receiving more of your manuscripts, and I look forward to seeing the reputation of the journal continue to grow over the next 12 months.

Best wishes to all

Dennis Brown
Editor in Chief, AJP Cell Physiology

APS LIASION WITH INDUSTRY COMMITTEE PRESENTS.....

The LWIC is sponsoring a workshop entitled "High Content Biology: Multiplexing in Cell Physiology" at EB2004 on Monday, April 19th from 3:15 to 5:15 pm. This workshop will describe novel methods for simultaneous analysis of multiple endpoints in cells. The topics of cell signaling, protein translocation, protein phosphorylation cascade, GPCR signaling as well as genomic mutational analysis will be covered. Look for the full program in the Spring.

The Novel Disease Model Award will be granted to a graduate student and a postdoctoral fellow who submit the best abstracts at EB2004 that describe a novel disease model. The model can be in vitro or in vivo but should clearly emphasize the potential utility of the system for future research related to a disease. The award is \$500 for the graduate student and \$800 for the postdoctoral fellow and is sponsored by the LWIC. See the call for abstracts this Fall for application details and in the Spring newsletter.

Your're invited! Come meet and eat with your fellow physiologists who are working in the corporate sector. The 4th Annual Liaison With Industry Committee Mixer is on at EB2004. Look for details in the Spring newsletter.

Submitted by section representative Chahrzad Montrose-Rafizadeh

**APS CELL & MOLECULAR SECTION
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