The American Society for Cell Biology

8120 Woodmont Avenue, Suite 750
Bethesda, MD 20814-2762
Tel: (301) 347-9300
Fax: (301) 347-9310
ascbinfo@ascb.org, www.ascb.org

Joan R. Goldberg
Executive Director

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Joan R. Goldberg *Editor*
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ASCB: The Big Tent Society

As a "big tent" society, the ASCB provides resources, support, and advocacy for cell biologists of diverse backgrounds and interests. It is wonderful to be part of this large community. What I find particularly exciting is the potential for welcoming scientists working in other fields—medicine and developmental biology, for example—into the fold. Our Annual Meeting, iBioSeminars series, and collection of images and videos (the ASCB Image & Video Library) illuminate how these fields are interwoven.


Brigid Hogan

Advances in technologies such as high-resolution, real-time imaging, genomics, and bioinformatics have made building bonds between cell biology and these disciplines much easier over the past few years. These common tools are helping us to understand how individual cells build tissues and organs, and how the organization of these dynamic, three-dimensional cellular structures goes awry in some human disorders and in cancer.

Cell Biology and Human Genetic Disorders: A Two-way Information Flow

The message that cell biology is providing important insights into human genetic disorders was highlighted at last year's ASCB Annual Meeting (see www.ascb.org/progeria). The theme will be taken up again this December in several different ways. An ASCB Annual Meeting Symposium on December 6, 2009, will feature Christine Petit, Val Sheffield, and Christopher Walsh. It will illustrate the fact that the information flow between cell biology and the clinic runs in two directions. On one hand, the study of proteins first identified by cell biologists has revealed the molecular basis of specific diseases. Conversely, the mapping of genes associated with inherited disorders—such as deafness, glaucoma, and mental retardation—has led to the identification of gene products not previously known to cell biologists. These proteins have turned out to be essential for processes like exocytosis, cell migration, and ciliary function. As we associate more and more genes with human disorders, this information flow will only increase, helping us to piece together the complex machinery of the cell.

Other Opportunities for Give and Take

Later at the ASCB meeting there will be a "Working Group" organized by Kevin Campbell, Michael Caplan, and Christine Seidman. These leading scientists will also illustrate how their work bridges cell biology and human disease. The format of the Working Group allows ideas to be developed in a more informal atmosphere than a Symposium. There are greater opportunities for give and take between the speakers and the audience. Come prepared to ask questions, and bring along a medical student or colleague and learn how you can both contribute to the new synthesis of ideas.

Ciliopathies—A Cluster of Human Disorders

Also featured at the ASCB Annual Meeting in San Diego will be one of the hottest topics in human genetics: the recent discovery that a whole range of human disorders that seem to have no connection—renal cysts, obesity, retinopathy, hypertension, anosmia, infertility, and mental retardation—all involve defects in proteins used for the generation and function of primary cilia. Cilia, and the connection between cilia and disease, will be topics of a Minisymposium and a Translational Session at the December meeting.

Developmental Biology = Cell Biology in Four Dimensions

One of the most rewarding aspects of being chair of a cell biology department and President of the ASCB is being able to foster closer collaborations between cell and developmental biologists. I have been in love with embryos, both normal and abnormal, from an early age. I remember as a child visiting my uncle, who was a pathologist in a London hospital, and being fascinated by the abnormal fetuses that were

then displayed in glass jars along the corridor to his lab. My mother had to drag me away!

My mother had no scientific background and worked as a dressmaker at home. But there was a deep fascination for me there too, in watching her produce complex three-dimensional dresses and hats out of fabrics of different consistencies and textures. These early captivations have led me to the pursuit of understanding how the organs of the embryo develop through the stretching, nipping, folding, budding, branching, and fusing together of tissue sheets. The embryo uses these cellular rearrangements again and again, in different combinations, to make different organs, and even something as deeply personal as a human face.

Translating Morphogenesis into Changes in Cell Behavior

As I outlined, for human disorders there has been tremendous progress over the past few years in understanding the cellular basis of morphogenesis. In part this has resulted from advances in high-resolution microscopy and the development of tools such as fluorescently labeled proteins that enable scientists to image individual cells and organelles in real time. (For more on this, see the presentations by 2008 ASCB E.B. Wilson Medalists Roger Tsien and Martin Chalfie at www.ascb.org/files/2008/1900-ascb-134-121608.wmv.)

Time-lapse videos of developing embryos show the dynamic changes in cell shape and arrangements that we need to understand in molecular terms. This challenge—to show how changes in embryo morphology are regulated by changes in the behavior of individual cells, and ultimately by the activity of specific genes—is masterfully discussed by Eric Weischaus in his iBioSeminars presentation on the patterning of the early *Drosophila* embryo. These seminars are sponsored by the ASCB with support from the Howard Hughes Medical Institute. They have become an important teaching tool (see www.ibioseminars.org).

Other iBioSeminars cover the cytoskeleton and how simple changes in the structure of its components may have enabled the evolution of complex multicellular organisms (Julie Theriot), how cells respond to mechanical cues in the extracellular matrix (Mary Beckerle), and the regulation of organ size (Martin Raff). These are all topics that are highly relevant to our understanding of how organs and tissues develop.

More exciting advances will likely feature in the Minisymposium on "The Cellular Basis of Morphogenesis" being organized for the ASCB Annual Meeting by developmental biologists John Wallingford and Gail Martin. A Symposium entitled "Cellular Sociology: Working Together in Morphogenesis" will feature Suzanne Eaton, Mark Krasnow, and Olivier Pourquié. These scientists are using cell biology and genetics, as well as bioengineering concepts and computation tools, to understand how cells work together to build structures like a wing, a branched lung, and a spinal column. I hope that their presentations will inspire new collaborations between cell and developmental biologists. I hope, too, that these themes will inspire videos and images for the 2009 Celldance competition (visit www.ascb.org/meetings for more information).

Embryos, Cells, and Art

Images of cells and embryos make for amazing art! Anyone who's ever looked at microscopic images knows this. However, I want to close by bringing to your attention a program called Bioartography organized by my friends at the University of Michigan (www.bioartography.com). It started as a project to sell images at the Ann Arbor Art Fair to support graduate and postgraduate students in the Center for Organogenesis. It has been very successful, and images can now be purchased online. Not only do the pictures inspire other biologists, they also help to inform the general public about science and about the cellular basis of development and disease—goals that all members of the ASCB should aspire to. And if you're fond of images you've seen in *Molecular Biology of the Cell*, *CBE—Life Sciences Education*, or on one of the ASCB websites, why not visit the ASCB Online Store to design and purchase your own t-shirt? Cells make good art, and cell biologists make good artists. Let the ASCB be your source, supply your medium, and provide your big tent. ■

Comments are welcome and should be sent to president@ascb.org.

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