

Experimental Biology 2012

21–25 APRIL 2012

San Diego Convention Center
San Diego, CA

Estimated attendance: 14,000



Six scientific societies came together in San Diego, CA, in April for their joint scientific sessions and annual meetings, creating a 'super-conference' called Experimental Biology 2012. The American Association of Anatomists (AAA), the American Physiological Society (APS; celebrating its 125th anniversary this year), the American Society for Biochemistry and Molecular Biology (ASBMB), the American Society for Investigative Pathology (ASIP), the American Society for Nutrition (ASN) and the American Society for Pharmacology and Experimental Therapeutics (ASPET) combined to hold more than 50 concurrent scientific sessions. Given the cross-disciplinary nature of the conference, it's no surprise that the sessions covered a broad range of topics.

An ASIP symposium on computational phenomics highlighted the advances and challenges in the use of high-throughput whole-animal image analysis for elucidating gene function and chemical toxicity. Researchers in this field are pushing the boundaries of both imaging and processing technology as they seek to extract and logically compile multiple types of structural and functional information from a single animal. The zebrafish is the focus of many of these studies because of its amenability to genetic manipulation and its size—it is the largest animal that can be imaged 'whole' at the appropriate resolution yet is small enough to allow for high-throughput processing (e.g., in multi-well plates).

ASPET sponsored a symposium on translational studies of pain and pain-associated behaviors as tools for drug development. Despite solid achievements in the treatment of acute pain, control of chronic pain remains a challenge. Contributors to the symposium discussed obstacles facing research in this area: the inherent inability to interrogate the emotional component of pain in animal models and the shortcomings of the behavioral assessments commonly used in pain studies. These and other factors may explain the lack of translational validity that has dogged preclinical pain research.

The American College of Veterinary Pathologists (ACVP) collaborated with ASIP and ASN to present a symposium on evolutionary aspects of animal models. The evolutionary relatedness among species is a cornerstone of the rationale governing our approach to biomedical research. But relatedness does not guarantee similarity in every characteristic. In selecting

the appropriate animal surrogate for a particular study, researchers should consider the relevance of their specific research question to the potential model. For example, while mice comprise a large majority of lab animals, they provide a poor model for infectious disease studies because human pathogens may have little relevance to mice. Their omnipresence further builds our knowledge about the mouse system but may not adequately address the original research questions. Furthermore, this 'foolish consistency' in the use of the mouse may stymie researchers' efforts to implement a more relevant, non-mouse, model in their studies.

In another perspective on evolutionary aspects of animal models, presenters shared how studying the evolution of a specific trait of interest in various animals can lead to a deeper understanding of the trait and a better framing of the research question. For example, aging occurs in all animals but at different rates, and species from various taxa may have unusually long lifespans compared with their close relatives. Evolutionary studies have shown that long lifespan has evolved multiple times in mammalian history, rather than just once, leading researchers to focus their studies on whether one or multiple mechanisms control this process. Additionally, in carrying out these studies, researchers noted that lifespan varies in laboratory versus wild populations of study animals, an observation that could have important implications for aging and other topics.

A later session, sponsored by APS, delved deeper into this premise by examining insights into the evolution of physiology from selection experiments in rodents. Participants described how they were manipulating rodent populations in their laboratories by selectively breeding animals with defined traits: voluntary running activity in rats and high aerobic capacity, ability to cope with a low-quality herbivorous diet and predatory behavior in bank voles. By investigating which other parameters change in these populations, the researchers are learning more about physiologic mechanisms underlying voluntary activity, metabolism and obesity.