Images in Lipid Research

The editors of the *Journal of Lipid Research* are pleased to announce the adoption of a new article format: “Images in Lipid Research.” Each peer-reviewed, one-page article contains a single horizontal image, a 400-word caption and up to four references. In creating the “Images in Lipid Research” format, we hope to celebrate scientists and the images they create. These articles will be easy to read and effective in communicating discoveries in lipid research. “Images in Lipid Research” will appear in PubMed and will be citable.

We anticipate that the lipid research community will submit images that inform readers on contemporary issues in lipid physiology and biochemistry (e.g., biogenesis of cytosolic lipid droplets and trafficking of “accessible cholesterol” within cells). However, images that underscore well-established paradigms in lipid metabolism (e.g., endocytosis of low-density lipoproteins in coated pits or trafficking of low-density lipoproteins to lysosomes) could also be appropriate, particularly if they highlight the utility of new imaging modalities. We also expect many submissions will highlight microscopy images, which are often the inspiration for discoveries. Fluorescence or electron micrographs, protein or lipid structures, and Manhattan plots would all be appropriate. Images from clinical medicine, for example photographs of xanthomas or magnetic resonance images of hepatic steatosis, also would be appropriate.

The inaugural “Images in Lipid Research” article is by Xia Meng and coworkers (1). Their image, created with a light sheet microscope, shows that GPIHBP1, the binding site for lipoprotein lipase (LPL) on the luminal surface of capillaries (2–5), is found on the endothelial cells of capillaries but not on endothelial cells in larger blood vessels. Limiting GPIHBP1 expression to capillary endothelial cells makes sense, given that those cells are located immediately adjacent to the adipocytes that produce LPL and an inhibitor protein (ANGPTL4) that regulates LPL catalytic activity.

Rolling out the “Images in Lipid Research” is timely (some might say overdue), given the importance of imaging in biomedical research. More than 20 years ago, University of California, Berkeley, cell biologist Daniel Mazia observed that “there are many paths in the advancement of science, but the giant leaps … have been made by seeing. First we see and then we interpret and only then do we pursue mechanisms and theories … A century ago, the microscope answered a number of great questions about how life goes on: fertilization, mitosis, and the basis of growth, chromosomes as the carriers of heredity, development, and social behaviors of cells” (6). Mazia went on to predict that advances in microscopy would uncover the “fine points of the physics and chemistry of cells” (6). His comments were on target. X-rays are widely considered to be the most important discovery of the past century, empowering
medical diagnostics, making it possible to solve protein structures, and allowing astronomers to record images of galaxies. Advanced imaging modalities, including super-resolution microscopy, light sheet microscopy, NanoSIMS imaging, cryoelectron microscopy and three-dimensional electron crystallography are already defining the “fine points” of the physics and chemistry of cells. The importance of imaging in biomedical research has been underscored by Nobel Prizes for magnetic resonance imaging, the use of fluorescent proteins in cell biology, the creation of super-resolution microscopes, and solving atomic structures of proteins by X-ray crystallography and cryo-electron microscopy. Over time, we anticipate that the articles will provide lipid investigators with an improved understanding of the strengths and limitations of different imaging approaches.

Of course, JLR already has a track record of highlighting the utility of advanced imaging modalities in lipid research. In a recent JLR methods paper (7), Jiang and coworkers described correlative backscattered electron imaging and NanoSIMS imaging, making it possible to correlate high-resolution images of chemical information (from secondary ion data) to high-resolution morphological features of cells (from backscattered electron microscopy). The correlative imaging strategy approach has made it possible to visualize $^2$H- or $^{13}$C-labeled lipids in different cell types and subcellular compartments (8).

In part, this new article format was inspired by the “Images in Clinical Medicine” series in The New England Journal of Medicine (NEJM). NEJM articles typically show images of skin rashes, micrographs of biopsy specimens, or diagnostic X-rays. The NEJM image articles are fun and effective in increasing the diagnostic acumen of physicians. We anticipate that JLR’s “Images in Lipid Research” series will be fun and informative for practicing scientists.

“Images in Lipid Research” articles will convey scientific vignettes that can be understood by a broad audience, making them suitable for dissemination through social media, such as the ASBMB’s Facebook pages (www.asbmb.org/lipiddivision/ and www.facebook.com/asbmb/) and the journal’s Twitter account (www.twitter.com/jlipidres). Also, the short vignettes will be effective in communicating discoveries to busy and overcommitted scientists who all too often are consumed with grant applications and assembling long manuscripts with multiple supplementary figures.

JLR’s new article format is not a photo contest. Everyone appreciates artistic images, but no submission, however beautiful the image, will be acceptable unless it delivers a scientific insight relevant to lipid research.
Instructions for preparing and submitting “Images in Lipid Research” articles can be found on the JLR website (www.jlr.org/site/misc/ifora.xhtml).

References

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