

Annual FASEB BioArt awards include NIEHS grantee

By Kelly Lenox

Each year, the Federation for American Societies for Experimental Biology (FASEB) holds a contest to find captivating images from cutting edge research. The 2014 winners (<http://www.faseb.org/About-FASEB/Scientific-Contests/BioArt/2014-BioArt-Winners.aspx>)

were announced Oct. 7, and the entry by an NIEHS grantee and his colleagues was named among the 10 winning images. Two videos were also selected.

Linked Video

["Watch this winning animation by Trisha Eustaquio and Angel M. Paredes showing 3-D mitochondria data in a healthy neuron. " \(0:57\)](#)

Model of DNA annealing

NIEHS grantee Jack Griffith, Ph.D., of the University of North Carolina at Chapel Hill Lineberger Comprehensive Cancer Center and the Department of Microbiology and Immunology, was the lead researcher on the project for which the image was originally generated. As part of a [study](http://www.ncbi.nlm.nih.gov/pubmed/23605044)

(<http://www.ncbi.nlm.nih.gov/pubmed/23605044>) published in the journal *Nucleic Acids Research*, the scientists presented the first 3-D reconstruction of a DNA-protein complex formed by a protein called infected cell protein 8 (ICP8), which is encoded by herpes simplex virus 1.

The winning image, prepared by Gokhan Tolun, Ph.D., who created the image while working in Griffith's lab, represents one of the two models the authors hypothesized as the mechanism by which the single-strand DNA forms a double-strand molecule. "The detail which Tolun was able to deduce provides a new view of how such large protein machines can facilitate DNA annealing and recombination," said Griffith. "This is a central goal of our funding from the NIEHS." In addition to NIEHS, the National Cancer Institute and National Institute of General Medical Sciences provided support for the research.

Communicating science through art

Tolun, now a postdoctoral fellow at the National Institute of Arthritis and Musculoskeletal and Skin Diseases, was the study's lead author. "The image [he] created takes advantage of both his skill in computer image reconstructions and his serious, personal hobby of photography, blending the science with a strong visual impact," said Griffith.

Tolun said he differs from scientists who usually consider preparing finely rendered figures as an afterthought. "After spending years doing the research, spending a bit more time to make that science more attractive and presentable is not only the fun part of science, but also serves the scientific community by reaching out to scientists in other areas and to the general public," Tolun explained.

While working in Griffith's lab as a postdoctoral fellow, Tolun found electron microscopy images prepared earlier by Alexander Makhov, Ph.D., of the University of Pittsburgh School of Medicine, another of the paper's authors. "I told Dr. Griffith that I wanted to reconstruct these images in 3-D," Tolun said. "He supported me to the fullest extent, and I will always be grateful to him for that." Because the lab did not specialize in structural biology, that meant Tolun had to master both this new field and specialized scientific software packages used to determine the 3-D structures of the biological complexes.

"Given that seeing is believing," Tolun said, "we scientists would be doing a disservice to ourselves if we did not spend some of our time making attractive-looking images to better convey our findings, proposed models, and conclusions."

Citation: [Tolun G, Makhov AM, Ludtke SJ, Griffith JD](#)
(<http://www.ncbi.nlm.nih.gov/pubmed/23605044>)



"I am a big supporter of making science more accessible to the public, so I'm happy to be part of the effort FASEB is putting into that," Tolun said. (Photo courtesy of Tolun)



Besides his notable work in the lab, Griffith is also an avid pilot, shown here with his Piper Cub. (Photo courtesy of Jack Griffith)

. Details of ssDNA annealing revealed by an HSV-1 ICP8-ssDNA binary complex. 2013. Nucleic Acids Res. Jun 41(11):5927-5937.

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