

Video Article

December 2016: This Month in JoVE

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Abstract

Here's a look at what's coming up in the December 2016 issue of [JoVE: The Journal of Visualized Experiments](#).

Grant deadlines, training interns, and impossible experiments got your hair turning gray? The first of our videos this month may have just the solution for you...without the toxic chemicals. In [JoVE Bioengineering](#) this month, [Im et al](#) (our Authors) demonstrate a novel formulation of permanent hair dye using natural plant phenols polymerized by fungal laccase. These environmentally friendly dyes color keratin hairs almost as quickly as commercial dyes, and can produce a variety of colors and shades. So now you can look fabulous once again for that conference presentation or thesis defense, naturally...

From looking amazing, to looking at amazing things, our second video highlight this month takes us into the nanoscopic world of three-dimensional super resolution microscopy. In [JoVE Bioengineering](#), [Wang et al](#) (our Authors) describe a new 3D microscopy technique based on single-molecule localization and multiphase interferometry. iPALM, or Interferometric PhotoActivated Localization Microscopy, gives the user almost isotropic resolution to 20 nm in all three dimensions, allowing for highly detailed analysis of ultrastructural cell features including the actin cytoskeleton. It's a big development, for some of the tiniest structures around.

Do you ever have that nightmare, with the giant insect flying a fighter jet, shooting lasers at you? No? Good, me either. Because in [JoVE Bioengineering](#) this month, [Ando et al](#) (our Authors) showcase their Insect Controlled Robot, piloted by a living silkworm. When docked into the cockpit of the robot, moths are exposed to pheromone odor plumes, and can maneuver the vehicle toward the odor source by walking on a modified track-ball. Biomimetic robots have tremendous potential for tasks including locating explosive or contraband materials, finding disaster victims, or detecting hazardous material spills...so think twice about squashing that bug in your house!

Our final video highlight this month is sleep-inducing...but it's certainly not dull! In [JoVE Medicine](#) [Traxdorf et al](#) (our Authors) demonstrate a standardized protocol for Drug Induced Sleep Endoscopy, or DISE, to study obstruction patterns during Obstructive Sleep Apnea. In this technique, patients are sedated using target-controlled infusion of the drug propofol. Once the subject reaches the desired precisely-controlled depth of anesthesia, researchers can examine the obstruction levels of even the most heterogeneous groups of patients. This may lead to better outcomes from upper airway surgeries...and possibly less snoring in faculty meetings?

You've just had a sneak peek of the December 2016 issue of [JoVE](#). Visit the website to see the full-length articles, plus many more, in [JoVE: The Journal of Visualized Experiments](#).

Video Link

The video component of this article can be found at <https://www.jove.com/video/5823/>

Protocol

Drug-Induced Sleep Endoscopy (DISE) with Target Controlled Infusion (TCI) and Bispectral Analysis in Obstructive Sleep Apnea

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The aim of this study was to establish a standardized protocol for sleep endoscopy to differentiate obstruction patterns in obstructive sleep apnea (OSA). Target-controlled infusion (TCI) of the sedative was combined with real-time monitoring of the depth of sedation using bispectral analysis.

Insect-controlled Robot: A Mobile Robot Platform to Evaluate the Odor-tracking Capability of an Insect

Noriyasu Ando, Shuhei Emoto, Ryohei Kanzaki

Research Center for Advanced Science and Technology, **The University of Tokyo**

The capability to localize an odor source is necessary for insect survival and is expected to be applicable to artificial odor-tracking. The insect-controlled robot is driven by an actual silkworm and enables us to evaluate the odor-tracking capability of insects through a robotic platform.

Synthesis of Plant Phenol-derived Polymeric Dyes for Direct or Mordant-based Hair Dyeing

Kyung Min Im, Jong-Rok Jeon

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Here, we present a protocol to use pre-synthesized polymeric products derived from fungal laccase-catalyzed polymerization of plant phenols, either with or without mordant agents (e.g., FeSO_4), to induce detergent-resistant keratin hair dyeing within 2.5 hours.

Three-dimensional Super Resolution Microscopy of F-actin Filaments by Interferometric PhotoActivated Localization Microscopy (iPALM)

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We present a protocol for the application of interferometric PhotoActivated Localization Microscopy (iPALM), a 3-dimensional single-molecule localization super resolution microscopy method, to the imaging of the actin cytoskeleton in adherent mammalian cells. This approach allows light-based visualization of nanoscale structural features that would otherwise remain unresolved by conventional diffraction-limited optical microscopy.

Disclosures

No conflicts of interest declared.