Video Article

JoVE Monthly Highlights December 2017

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Abstract

Here's a look at what's coming up in the December 2017 issue of JoVE: The World's Premier Video Journal.

From a flurry of fantastic articles for December, we begin with a customizable MRI guided focused ultrasound treatment for patients with essential tremor. In JoVE Medicine, our authors describe patient selection, equipment setup, sonication, and post treatment follow-up. The exciting results show that patients experienced both short- and long-term reductions in their tremors, beginning immediately after treatment.

Next, JoVE Neuroscience loops in to the circulatory system. Here, our authors describe a protocol that uses diffuse polarization spectroscopy to improve the clinical usefulness of the capillary refill test. The capillary refilling response is measured quantitatively using videos, in contrast to traditional methods that rely on visual observation. Compared to naked eye observations, this method allows for more accurate monitoring of circulation in critically injured or ill patients.

In a gem of an article, from JoVE Developmental Biology, our authors demonstrate a procedure for microinjecting developing jewel wasps *Nasonia vitripennis*. The test embryos were removed from their parasitized host pupae, and successfully injected with CRISPR/Cas9 molecules. This procedure overcomes significant challenges in working with jewel wasp embryos and will allow future research groups to perform genome modifications in this and similar organisms.

Our final article heats things up, with laboratory experiments simulating the formation of a lava-phase following a nuclear reactor core meltdown. In JoVE Chemistry, our authors heat real nuclear fuel, cladding, and containment materials to temperatures beyond 3,000 degrees Kelvin. These experiments answer key questions related to core meltdown, and contribute to the prevention of severe accidents in nuclear power plants. That's hot science!

You've just had a sneak peek of the December 2017 issue of JoVE. Visit our website to see the full-length articles, plus many more, in JoVE: The World's Premier Video Journal.

Video Link

The video component of this article can be found at https://www.jove.com/video/5949/

Protocol

Embryo Microinjection and Transplantation Technique for *Nasonia vitripennis* Genome Manipulation

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Microinjection of *Nasonia vitripennis* embryos is an essential method for generating heritable genome modifications. Described here is a detailed procedure for microinjection and transplantation of *Nasonia vitripennis* embryos, which will greatly facilitate future genome manipulation in this organism.

Diffuse Reflectance Spectroscopy: Getting the Capillary Refill Test Under One's Thumb

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This protocol describes how the use of diffuse polarization spectroscopy can improve the clinical usefulness of the capillary refill test. We suggest a more detailed analysis of the course of the capillary refill in healthy volunteers using diffuse reflectance spectroscopy videos and new informatic endpoints.

MRI-guided Focused Ultrasound Thalamotomy for Patients with Medically-refractory Essential Tremor

Ying Meng[1], Yuexi Huang[2], Benjamin Solomon[2], Kullervo Hynynen[2], Nadia Scantlebury[1], Michael L. Schwartz[1], Nir Lipsman[1]

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High-intensity MRI guided focused ultrasound is an emerging noninvasive technique to precisely ablate brain tissue. It has been shown to be safe and effective in treating medically-refractory essential tremor. This article describes the protocol for thalamotomy from patient selection to equipment setup to post-treatment follow-up.

Laser-heating and Radiance Spectrometry for the Study of Nuclear Materials in Conditions Simulating a Nuclear Power Plant Accident

Dario Manara[1], Luca Soldi[1,2,4], Sara Mastromarino[1,3,5], Kostantinos Boboridis[1], Davide Robba[1], Luka Vlahovic[1], Rudy Konings[1]

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We present experiments in which real nuclear fuel, cladding, and containment materials are laser heated to temperatures beyond 3,000 K while their behavior is studied by radiance spectroscopy and thermal analysis. These experiments simulate, on a laboratory scale, the formation of a lava-phase following a nuclear reactor core meltdown.

Disclosures

No conflicts of interest declared.

