Video Article

JoVE Monthly Highlights: August 2017

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URL: https://www.jove.com/video/5846
DOI: doi:10.3791/5846

Keywords: This Month in JoVE, Issue 126,

Date Published: 8/4/2017

Citation: Chamberlain, N., Navani, D. JoVE Monthly Highlights: August 2017. *J. Vis. Exp.* (126), e5846, doi:10.3791/5846 (2017).

Abstract

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

We begin this month with an endearing study from JoVE Biology, as our Authors describe a protocol to determine the effects of environment and genetics on white-tailed deer development. The researchers captured fawns and pregnant females at several distinct physiographic regions in Mississippi, and then relocated the animals to a controlled habitat. Under standardized environmental conditions, the body mass and antler size of the deer was recorded over two generations. The results showed that the phenotypic variation of deer is more strongly related to nutritional factors than population-level genetics.

From creatures great to creatures small, our next video highlight from JoVE Biology looks at zebrafish neural crest development. Here, our Authors use live embryos to track migrating stem cells in real-time. The zebrafish is an emerging model for such studies due to the similarity of their eye development to their mammalian counterparts. Using multi-photon time-lapse imaging, real-time videos of developing zebrafish eyes can help scientists understand how disruptions in the development of the neural crest can cause congenital eye and craniofacial anomalies. This technique can also be applied to visualizing the development of other tissues.

Our next video article also explores the generation of new tissues - but artificially. In JoVE Bioengineering, our Authors showcase their method for engineering vascularized tissues and organoids. Using a novel variation of microfluidic bioprinting, the researchers create a microfibrous scaffold that can be populated by epithelial cells. Over a period of several days, these encapsulated cells can form lumen-like structures, which resemble vasculature. This endothelialized scaffold can then be used as a vascular bed, and seeding with secondary cell types can produce new vascularized tissue. And I can't even get my printer to connect to wifi.

Finally this month, JoVE Neuroscience highlights promising developments for patients with disorders of consciousness. Here, our Authors demonstrate a suite of hybrid Brain-Computer interface-based paradigms that can assess the level of consciousness of people unable to provide motor response and then establish communication. Using electroencephalography, to monitor brain activity, the researchers presented tasks requiring patients to concentrate on certain stimuli or movements. In multiple cases, the data showed that patients were able to complete the assignments, giving hope for clear channels of communication in the near future.

You've just had a sneak peek of the August 2017 issue of JoVE. Visit the 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/5846/

Protocol

Assessment and Communication for People with Disorders of Consciousness

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With this experiment, one might be able to detect consciousness in people with disorders of consciousness. Furthermore, the approach can create a simple communication channel that enables people to give simple YES/NO answers to questions.

Protocol for Assessing the Relative Effects of Environment and Genetics on Antler and Body Growth for a Long-lived Cervid

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Phenotypic differences among cervid populations may be related to population-level genetics or nutrition; discerning which is difficult in the wild. This protocol describes how we designed a controlled study where nutritional variation was eliminated. We found that phenotypic variation of male white-tailed deer was more limited by nutrition than genetics.

Multi-Photon Time Lapse Imaging to Visualize Development in Real-time: Visualization of Migrating Neural Crest Cells in Zebrafish Embryos

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A combination of the advanced optical techniques of laser scanning microscopy with long wavelength multi-photon fluorescence excitation was implemented to capture high-resolution, three-dimensional, real-time imaging of neural crest migration in Tg(*sox10:EGFP*) and Tg(*foxd3:GFP*) zebrafish embryos.

Microfluidic Bioprinting for Engineering Vascularized Tissues and Organoids

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We provide a generalized protocol based on a microfluidic bioprinting strategy for engineering a microfibrous vascular bed, where a secondary cell type could be further seeded into the interstitial space of this microfibrous structure to generate vascularized tissues and organoids.

Disclosures

No conflicts of interest declared.

