Video Article

August 2011: This Month in JoVE

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[1]

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Abstract

Video Link

The video component of this article can be found at https://www.jove.com/video/3776/

Protocol

Examining the Characteristics of Episodic Memory using Event-related Potentials in Patients with Alzheimer's Disease

Erin Hussey, Brandon Ally
Department of Neurology, Vanderbilt University

The methodology for collecting high-density event-related potential data while patients with Alzheimer's disease perform a recognition memory task is reviewed. This protocol will include subject preparation, quality assurance, data acquisition, and data analysis.

Axon Stretch Growth: The Mechanotransduction of Neuronal Growth

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A unique tissue engineering method was developed to elongate numerous nerve fibers in culture by recapitulating axon stretch growth; a form of nervous system growth whereby nerves elongate in conjunction with growth of the enlarging body.

Rapid Diagnosis of Avian Influenza Virus in Wild Birds: Use of a Portable rRT-PCR and Freeze-dried Reagents in the Field

John Y. Takekawa[1], Nichola J. Hill[1, 2], Annie K. Schultz[1], Samuel A. Iverson[1], Carol J. Cardona[3, 4], Walter M. Boyce[2], Joseph P. Dudley[5]
[1]USGS Western Ecological Research Center, [2]Wildlife Health Center, University of California, Davis, [3]Department of Population Health and Reproduction, University of California, Davis, [4]Department of Veterinary and Biomedical Sciences, University of Minnesota , [5]Science Applications International Corporation

This study describes diagnosis of avian influenza in wild birds using a portable rRT-PCR system. The method takes advantage of freeze-dried reagents to screen wild birds in a non-laboratory setting, typical of an outbreak scenario. Use of molecular tools provides accurate and sensitive alternatives for rapid diagnosis.

Avian Influenza Surveillance with FTA Cards: Field Methods, Biosafety, and Transportation Issues Solved

Robert H.S. Kraus[1], Pim van Hooft[1], Jonas Waldenström[2], Neus Latorre-Margalef[2], Ronald C. Ydenberg[1, 3], Herbert H.T. Prins[1]
[1]Resource Ecology Group, Wageningen University, [2]Section for Zoonotic Ecology and Epidemiology, School of Natural Sciences, Linnaeus University, [3]Centre for Wildlife Ecology, Simon Fraser University

A method to preserve, detect and sequence RNA from Avian Influenza Viruses was validated and extended using natural faecal samples from birds. This technique removes the necessity of maintaining a cool chain and handling of infectious viruses and can be applied in a 96-well high-throughput setup.

Time-lapse Microscopy Of Early Embryogenesis in *Caenorhabditis elegans*

Lynn Boyd[1], Connie Hajjar[1], Kevin O'Connell[2]
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This article describes a technique for the visualization of the early events of embryogenesis in the nematode *Caenorhabditis elegans*.

Agrobacterium-Mediated Virus-Induced Gene Silencing Assay In Cotton

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We present the detailed protocol for Agrobacterium-mediated virus-induced gene silencing (VIGS) assay in cotton. The tobacco rattle virus (TRV)-derived VIGS vectors were deployed to induce RNA silencing of cotton GrCLA1, Cloroplastos alterados 1 gene. The albino phenotype caused by silencing GrCLA1 was observed at the seedling stage within 2 weeks after inoculation.

Multi-electrode Array Recordings of Neuronal Avalanches in Organotypic Cultures

Dietmar Plenz, Craig V. Stewart, Woodrow Shew, Hongdian Yang, Andreas Klaus, Tim Bellay
Section on Critical Brain Dynamics, National Institute of Mental Health

A robust way to study neuronal avalanches, i.e. scale-invariant spatio-temporal activity bursts, indicative of critical state dynamics in cortex. Avalanches emerge spontaneously in developing superficial layers of cultured cortex which allows for long-term measurements of the activity with planar integrated multi-electrode arrays (MEA) under precisely controlled conditions.

Haptic/Graphic Rehabilitation: Integrating a Robot into a Virtual Environment Library and Applying it to Stroke Therapy

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Recently, a vast amount of prospects have come available for human-robot interactive systems. In this paper we outline the integration of a new robotic device with open source software that can rapidly make possible a library of interactive functionality. We then outline a clinical application for a neurorehabilitation application.

Pharmacological and Functional Genetic Assays to Manipulate Regeneration of the Planarian *Dugesia japonica*

John D. Chan, Jonathan S. Marchant
Department of Pharmacology and The Stem Cell Institute, University of Minnesota Medical School

An attractive model for studying stem cell differentiation within a live animal is the planarian flatworm. Regeneration is studied by simple amputation experiments that are easily performed in a basic laboratory and are amenable to pharmacological and genetic (in vivo RNAi) manipulation as detailed by protocols in this article.

