

Video Article

November 2015 - This Month in JoVE: Drosophila Social Space, Structured Rehabilitation for Multifunctional Prosthetics, and Thermal Imaging in Wild Birds

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Abstract

Here's a look at what's coming up in the [November 2015 issue](#) of [JoVE: The Journal of Visualized Experiments](#).

In [JoVE Neuroscience](#), we know that [fruit flies \(*Drosophila melanogaster*\)](#) are a lot like humans in many ways—especially because they like their personal space. And in fruit flies, this preferred social distance can be measured using the social space assay. [McNiel *et al.*](#) demonstrate this straightforward protocol, which requires only simple equipment and experimental setups. Flies are blown into a social chamber and forced to form a tight group. Then they're allowed to take their preferred distance from one another. These distances are measured and processed with free online software (ImageJ). This social space assay provides a simple yet powerful paradigm for analyzing the underlying neurogenetics and environmental factors of social behavior.

In [JoVE Behavior](#), humans have a natural ability to acquire new motor skills, and this ability is crucial for upper limb amputees as they learn the complex control schemes for advanced multifunctional prosthetics. This month, [Roche *et al.*](#) present a case study of a structured rehabilitation method, which aims to improve multifunctional prosthetic control. Their subject underwent a structured protocol of imitation, repetition, and reinforcement learning. The subject demonstrated improvement in a widely used hand function test. This study suggests that a structured rehabilitation method may facilitate proficiency for multifunctional prosthetic control, and provides basis for larger clinical studies.

[Stress](#) is a major concept in [JoVE Behavior](#), and comprises various physiological responses to challenges. Among other responses, stress increases body temperature, which provides a quantitative measure of this response. However, the very act of measuring body temperature can be stressful to subjects, especially if they're wild animals. So [Jerem *et al.*](#) present a protocol for noninvasively measuring temperature in wild birds using infrared thermography. Their set-up is equipped with bird food and an infrared camera. This takes a thermal video of the bird before and after the researcher remotely closes the box, which acts as a mild acute stressor. The skin around the bird's eye is the warmest area in the image, and this protocol provides a time series of eye-region temperature with fine temporal resolution. With further validation, this method may prove valuable for studying the dynamics of the stress response for a wide range of researchers from environmental science to medicine.

You've just had a sneak peek of the [November 2015 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/5758/>

Protocol

A Structured Rehabilitation Protocol for Improved Multifunctional Prosthetic Control: A Case Study

Aidan Dominic Roche^{1,2}, Ivan Vujaklija^{3,4}, Sebastian Amsüss^{3,4}, Agnes Sturma^{1,5}, Peter Göbel⁶, Dario Farina^{3,4}, Oskar C. Aszmann^{1,2}

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As prosthetic development moves towards the goal of natural control, harnessing amputees' inherent ability to learn new motor skills may enable proficiency. This manuscript describes a structured rehabilitation protocol, which includes imitation, repetition, and reinforcement learning strategies, for improved multifunctional prosthetic control.

Conditions Affecting Social Space in *Drosophila melanogaster*

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The effect of genes and environment on social space of *Drosophila melanogaster* can be quantified through a powerful but straightforward analytical paradigm. We show here different factors that can affect this social space, and thus need to be taken into consideration when designing experiments in this paradigm.

Thermal Imaging to Study Stress Non-invasively in Unrestrained Birds

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There is a need for a non-invasive assessment of stress. This paper describes a simple protocol using thermal imaging to detect a significant response in eye-region temperature in wild blue tits to a mild acute stressor.

Disclosures

No conflicts of interest declared.