Video Article

April 2016 - This Month in JoVE: Cell Migration, Bacterial Motility, Psycholinguistics, and In Vitro Eye Model for Contact Lenses

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Abstract

Here's a look at what's coming up in the April 2016 issue of JoVE: The Journal of Visualized Experiments.

In JoVE Developmental Biology, cell migration is a vital process in multicellular organisms. It is not only essential during embryonic development, but also in adult life, when it contributes to physiological processes like wound healing and immunity. It is also involved in pathological situations, such as cancer growth and metastasis. Cell migration has been studied for decades *in vitro*; but *in vivo* studies have proven to be more difficult. This month Giger *et al*. use cell transplantation to create mosaic zebrafish embryos, and taking advantage of the embryos' optical clarity, they analyze the migration of the prospective prechordal plate as a model system for studying gene function.

In JoVE Immunology & Infection, many bacteria can also move, and in some species, motility contributes to the capacity to invade and replicate in host tissues. The bacterium *Xylella fastidiosa* causes a number of diseases in economically important plants, and its twitching motility provides the means for long-distance travel and colonization. To study the mechanisms of twitching motility in *X. fastidiosa*, Shi and Lin use a nano-microfluidic flow chamber integrated with a time-lapse image recording system. This allows long-term spatial and temporal observations of bacterial aggregation and migration. This system also provides a new approach for studying gene function in bacterial motility.

In JoVE Behavior, it's well known that the more often a word occurs, the faster it can be identified. This phenomenon is known as the frequency effect. This month, Gao *et al*. study the frequency effect using Chinese characters and two experimental paradigms in the field of psycholinguistic research: the lexical decision task, which measures how long it takes a subject to decide whether or not a character is an actual word; And the naming task, which measures how long it takes to speak a written word out loud. By using both methods, researchers can paint a more complete and precise picture of character and word recognition.

In JoVE Bioengineering, vision researchers have been striving to create an *in vitro* eye model to test contact lenses. Most models to date have many limitations in terms of physiological relevance, but this month Phan *et al*. present an ocular platform that simulates physiological tear flow, tear volume, air exposure and mechanical wear. This system is highly versatile and can be applied to various *in vitro* analyses with contact lenses.

You've just had a sneak peek of the April 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/5777/

Protocol

Analyzing *In Vivo* Cell Migration using Cell Transplantations and Time-lapse Imaging in Zebrafish Embryos

Florence A Giger[1], Julien G Dumortier[2], Nicolas B David[1]

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Combining cell transplantation, cytoskeletal labeling and loss/gain of function approaches, this protocol describes how the migrating zebrafish prospective prechordal plate can be used to analyze the function of a candidate gene in *in vivo* cell migration.

Comparing the Frequency Effect Between the Lexical Decision and Naming Tasks in Chinese

Xin-Yu Gao*[1], Meng-Feng Li*[1], Tai-Li Chou*[2], Jei-Tun Wu[1]

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Researchers adopt both the lexical decision task and the naming task to investigate some important topics such as character/word recognition by comparing the frequency effect between these two tasks. This article introduces this approach through two exemplar experiments and elaborates on the underlying logic.

Development of an *In Vitro* Ocular Platform to Test Contact Lenses

Chau-Minh Phan[1], Hendrik Walther[1], Huayi Gao[2], Jordan Rossy[1], Lakshman N. Subbaraman[1], Lyndon Jones[1]

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Current *in vitro* models for evaluating contact lenses (CLs) and other eye-related applications are severely limited. The presented ocular platform simulates physiological tear flow, tear volume, air exposure and mechanical wear. This system is highly versatile and can be applied to various *in vitro* analyses with CLs.

Visualization of Twitching Motility and Characterization of the Role of the *PilG* in *Xylella fastidiosa*

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In this study, a nano-microfluidic flow chamber was employed to visualize and functionally characterize the twitching motility of *Xylella fastidiosa,* a bacterium that causes Pierce's disease in grapevine.

Disclosures

No conflicts of interest declared.