Video Article

March 2014: This Month in JoVE - Food-Related Motivation, Pathogens in the Deli, Diagnosing ALS, and Bioengineering Cells into Patterns

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Abstract

Here's a look at what's coming up in the March 2014 issue of JoVE: The Journal of Visualized Experiments.

This month, we have a special culinary focus with food-related articles from various JoVE sections.

In JoVE Environment, we have a method for tracking the spread of the bacterium *Listeria monocytogenes*. This foodborne pathogen contaminates all kinds of foods in the retail environment - including dairy, eggs, produce, meat, and fish. According to the Centers for Disease Control and Prevention (CDC), *Listeria* sickens around 1,600 people in the United States every year, and is the 3rd leading cause of death related to food poisoning. Many cases of *Listeria*-related illness can be traced to contaminated deli meats, especially those sliced by retailers. To study how this potentially deadly pathogen spreads in retail environments, Sirsat *et al*. simulate bacterial contamination of deli meat using a fluorescent compound that glows under black light, focusing on the deli slicer itself as a critical point of *Listeria* cross contamination. This method can be adapted to study other microbial pathogens in retail and industrial environments, and facilitate sanitary practices in multiple settings.

In a culinary article from JoVE's Behavior section, we examine what drives us to eat. Besides the obvious impulse of hunger, the rewarding aspects of food can drive certain behaviors, especially overeating. Ziauddeen *et al*. use several methods to examine food-related motivation. In one experiment, subjects have to physically work to win food or non-food rewards. In another experiment, they test whether subliminal images of a food reward can affect an individual's willingness to work for it. In a third experiment, subjects assign monetary values on various foods, which yields quantitative measures of food-related rewards. These methods can be used to study the effectiveness of anti-obesity treatments that alter the reward value of food.

In JoVE Clinical and Translational Medicine, we feature an article on amyotrophic lateral sclerosis (ALS, commonly known as Lou Gehrig's disease). In this degenerative neuromuscular disease, muscles become paralyzed when motor neurons disconnect from muscle fibers at the neuromuscular junction (NMJ). An early symptom that is specific to ALS is the split hand phenomenon, or the preferential weakness of a specific group of hand muscles, while other hand muscles are spared. Menon and Vucic demonstrate a novel method of obtaining split hand index scores. To do this, they record maximal motor responses from three hand muscles. By comparing the responses of various patients, our authors demonstrate how this index can distinguish ALS from other neuromuscular diseases.

In JoVE Bioengineering, many applications involve growing cells on synthetic surfaces. Therefore, a common bioengineering research goal is to understand the mechanisms of cell adhesion and patterning on synthetic materials. Hughes *et al*. have developed a method for photolithographically printing silicon dioxide chips with paralene-C. Cells specifically adhere to the paralene-C while being repelled by the silicon dioxide. This technique has allowed patterning of a broad range of cell types, including HEK 293 cells, primary human glioma-derived stem-like cells, and 3T3 L1 cells

You've just had a sneak peek of the March 2014 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/5274/

Protocol

Study of Phagolysosome Biogenesis in Live Macrophages

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Studying Food Reward and Motivation in Humans

Hisham Ziauddeen[1,2,3], Naresh Subramaniam[1], Victoria C. Cambridge[4], Nenad Medic[1,2], Ismaa Sadaf Farooqi[2], Paul C. Fletcher[1,2,3]

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This article describes a set of methods for the measurement of food related motivation and food related goal values in humans.

Cell Patterning on Photolithographically Defined Parylene-C: SiO_2 Substrates

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This protocol describes a microfabrication-compatible method for cell patterning on SiO_2. A predefined parylene-C design is photolithographically printed on SiO_2 wafers. Following incubation with serum (or other activation solution) cells adhere specifically to (and grow according to the conformity of) underlying parylene-C, whilst being repulsed by SiO_2 regions.

Disclosures

No conflicts of interest declared.

