From: F1000 Biology Update <[redacted]>
To: Jeff Epstein <jeeproject@yahoo.com>
Subject: Mobile phone microscopy, caffeine's effects on neonates and who will fight for researchers' rights?
Date: Wed, 21 Oct 2009 13:45:15 +0000

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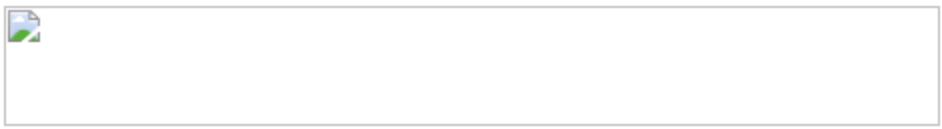

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Post-publication peer review at its best

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Blog: Who will fight for researchers' rights?

A recent F1000 blog post looked at an exceptional Journal of Neuroscience opinion piece on animal research that was evaluated by more than a dozen members of our Neuroscience Faculty.

The evaluations on Faculty of 1000 Biology of the article, "We Must Face the Threats" by scientists from the University of California, explored how the animal testing debate affects the global science community.

Read all comments in full.

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Editor's Choice: Mobile phone-based clinical microscopy for global health applications

Biological studies often depend on observations 'in the field'. The challenge for researchers, therefore, is how to gather data of sufficient quantity and quality in areas that instruments and scientists cannot reach? In a recent paper highlighted by Sean Ryder of the Cell Biology Faculty, researchers suggest taking advantage of the ubiquity of mobile phone networks in developing areas by using an imaging tool that fits into a 3.2Mp camera phone.

Dr Ryder explains

> "Light and fluorescence microscopy is required for many diagnostic evaluations of human disease. The equipment necessary to obtain diagnostic images is not portable and is often expensive, which limits its use in many regions of the world."

He continues

> "The authors of this paper devise a simple fluorescence microscope that incorporates cell phone camera technology, LED fluorescence activation, and inexpensive optical equipment. They demonstrate the utility of this instrument in the collection and post-processing of diagnostic images of bacterial and parasitic infections and genetic disease in the field"

And concludes

> "This simple yet ingenious device promises to revolutionize diagnostic medicine in the developing world, and could prove a useful tool to researchers that collect and analyze field samples."

Read all comments in full.

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Broad Impact: Mechanism of protein kinase activation in cell signaling revealed

An exceptional article from the University of Texas reveals how ubiquitin activates protein kinases in cell signaling. By reconstituting TAK 1 activation in vitro to study TRAF6-dependent ubiquitination, the authors discover the mechanism by which this occurs.

David Wotton of the Cell Biology Faculty explains

> "Although proteins within the pathway were known to be poly-ubiquitinated as part of the TAK1 activation mechanism, it was not known whether the ubiquitination of a specific protein was required, or simply the presence of poly-ubiquitin chains."

James Meabon and Mark Bothwell, Neuroscience Faculty, tell us

> "The present paper reveals that TRAF6-dependent regulation of the activity of protein kinases such as TAK1 and IKK does not require covalent modification of the protein kinases by polyubiquitin. Rather, TRAF6 catalyzes the synthesis of free-floating polyubiquitin chains. Unanchored polyubiquitin apparently activates TAK1 by binding non-covalently to the TAK1 regulatory protein TAB1."

John Kyriakis of the Cell Biology Faculty adds

"They also provide evidence that activation involves trans-autophosphorylation. This paper describes a new form of second messenger -- Lys63-linked poly-Ub -- and explains how TRAF6 mutants missing their autoubiquitination sites, but still possessing E3 activity, retain their signaling capability."

Estanislao Nistal-Villan and Adolfo Garcia-Sastre, Microbiology Faculty, believe

"Further investigations on the role of free polyubiquitin and ubiquitin-like molecules in regulating cellular processes during normal cellular functions and during pathological conditions, including infectious diseases, may open new possibilities to design intervention strategies for the treatment of multiple diseases."

Read all comments in full.

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Hidden Jewel: Caffeine's long term consequences on neonates

The authors of this Must Read paper, highlighted by James Duffin of the Physiology Faculty, describe experiments on rats showing that caffeine treatment in neonates leads to changes in sleep and respiratory regulation that continue in adulthood.

Dr Duffin explains

"Premature babies often experience instabilities of breathing with the occurrence of apneas. To treat this condition, caffeine, an adenosine receptor antagonist, is commonly used as a respiratory stimulant for extended periods with beneficial results. However, the long-term effects of neonatal caffeine treatment on brain development have not been examined."

He continues

"The authors of this study questioned whether caffeine administration in the neonatal period would have lasting effects on sleep and breathing regulation. They tested their hypothesis on rats and found that adult rats treated with caffeine during their neonatal period had increased resting ventilation, reduced sleep time (with increased sleep onset latency), and fragmented non-rapid eye movement sleep compared to controls."

He says

"The findings therefore raise concerns about the long-term consequences of neonatal caffeine administration on brain development and behavior."

Read all comments in full.

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See the latest 4 articles published in F1000 Biology Reports, including "When transcription meets recombination: a lesson from the human RECQ protein complexes" by Yilun Liu and Cell Biology Section Head Joan Conaway. Then look out for the next set of 4 articles that will be published at the end of the month.

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Geographical variation in predictors of mammalian extinction risk: big is bad, but only in the tropics.
Fritz SA et al. *Ecol Lett* 2009 Jun **12**(6):538-49

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