



LETTERS

edited by Jennifer Sills

Pause on Avian Flu Transmission Research

THE CONTINUOUS THREAT OF AN INFLUENZA PANDEMIC REPRESENTS ONE OF THE BIGGEST CHALLENGES in public health. Influenza pandemics are known to be caused by viruses that evolve from animal reservoirs, such as in birds and pigs, and can acquire genetic changes that increase their ability to transmit in humans. Pandemic preparedness plans have been implemented worldwide to mitigate the impact of influenza pandemics. A major obstacle in preventing influenza pandemics is that little is known regarding what makes an influenza virus transmissible in humans. As a consequence, the potential pandemic risk associated with the many different influenza viruses of animals cannot be assessed with any certainty.

Recent research breakthroughs identified specific determinants of transmission of H5N1 influenza viruses in ferrets. Responsible research on influenza virus transmission using different animal models is conducted by multiple laboratories in the world using the highest

international standards of biosafety and biosecurity practices that effectively prevent the release of transmissible viruses from the laboratory. These standards are regulated and monitored closely by the relevant authorities. This statement is being made by the principal investigators of these laboratories.

In two independent studies conducted in two leading influenza laboratories at the University of Wisconsin–Madison and Erasmus MC in Rotterdam, the Netherlands, investigators



have proved that viruses possessing a hemagglutinin (HA) protein from highly pathogenic avian H5N1 influenza viruses can become transmissible in ferrets. This is critical information that advances our understanding of influenza transmission. However, more research is needed to determine how influenza viruses in nature become human pandemic threats, so that they can be contained before they acquire the ability to transmit from human to human, or so that appropriate countermeasures can be deployed if adaptation to humans occurs.

Despite the positive public health benefits these studies sought to provide, a perceived fear that the ferret-transmissible H5 HA viruses may escape from the laboratories has generated intense public debate in the media on the benefits and potential harm of this type of research. We would like to assure the public that these experiments have been conducted with appropriate regulatory oversight in secure containment facilities by highly trained and responsible personnel to minimize any risk of accidental release. Whether the ferret-adapted influenza viruses have the ability to transmit from human to human cannot be tested.

We recognize that we and the rest of the scientific community need to clearly explain the benefits of this important research and the measures taken to minimize its possible risks. We propose to do so in an international forum in which the scientific community comes together to discuss and debate these issues. We realize that organizations and governments around the world need time to find the best solutions for opportunities and challenges that stem from the work. To provide time for these discussions, we have agreed on a voluntary pause of 60 days

on any research involving highly pathogenic avian influenza H5N1 viruses leading to the generation of viruses that are more transmissible in mammals. In addition, no experiments with live H5N1 or H5 HA reassortant viruses already shown to be transmissible in ferrets will be conducted during this time. We will continue to assess the transmissibility of H5N1 influenza viruses that emerge in nature and pose a continuing threat to human health.

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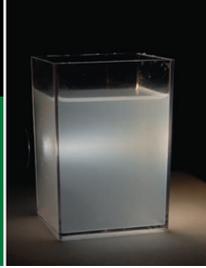
Letters to the Editor

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Prion transmission

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IBI Prize Essay

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Recognizing Existing Models

IN THEIR EDITORIAL "ADDRESSING SCIENTIFIC fraud" (2 December 2011, p. 1182), J. Crocker and M. L. Cooper suggest that we need to develop better systems to report suspected misconduct and fraud. They overlook useful current models that institutions and investigators can follow. For example, David Goodstein, a respected physicist and former vice-provost at CalTech, has recently published a book (*I*) that discusses the issue of investigator misconduct in considerable detail. He presents, as an appendix, the text of the CalTech policy, which is closely aligned with that of the federal government.

There is simply no excuse for any institution or journal to be without a clear policy on misconduct or a clear procedure for handling allegations of misconduct. This is not a subject to be thought through after an allegation. No institution should think that this topic only arises somewhere else or in some other research environment.

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1. D. Goodstein, *On Fact and Fraud* (Princeton Univ. Press, Princeton, NJ, 2010).

Portugal's Age of Enlightenment

IN 2001, *SCIENCE* PUBLISHED AN ARTICLE heralding the arrival of a scientific "age of enlightenment" in Portugal (*I*). This culture of science was impressive considering that Portugal has virtually no historical foundation for scientific research (unlike other European countries with identical demographic or cultural indicators). In the decade that has passed since that article, Portuguese R&D has taken advantage of the increase in national and European Union funding and harnessed the talents of new and younger leaders. However, there are signs of trouble despite the advances.

The Portuguese national funding agency, Fundação para a Ciência e a Tecnologia (FCT), which had previously financed proj-

CORRECTIONS AND CLARIFICATIONS

News Focus: "America's lost city" by A. Lawler (23 December 2011, p. 1618). On p. 1623, Indiana University–Bloomington was referred to incorrectly as the University of Indiana.

Reports: "Empathy and pro-social behavior in rats" by I. B.-A. Bartal *et al.* (9 December 2011, p. 1427). On p. 1428, the last full paragraph of column 1 was incorrect. The paragraph should be replaced by this corrected text: "All female rats (6/6) and most male rats (17/24) in the trapped condition became door-openers. Female rats in the trapped condition opened the restrainer door at a shorter latency than males on days 7 to 12 ($P < 0.01$, MMA, Fig. 3A), consistent with suggestions that females are more empathic than males (7, 12, 13). Furthermore, female rats were also more active than males in the trapped condition ($P < 0.001$, ANOVA) but not in the empty condition (Fig. 3B)."

TECHNICAL COMMENT ABSTRACTS

Comment on "Dynamics of Dpp Signaling and Proliferation Control"

Gerald Schwank, Schu-Fee Yang, Simon Restrepo, Konrad Basler

Wartlick *et al.* (Research Articles, 4 March 2011, p. 1154) reported that growth rates in the *Drosophila* wing disc correlate with increasing Dpp signaling levels, suggesting that the rate of Dpp increase determines the cell-cycle length. Contradicting their model, we found that cells in which the increase of Dpp signaling levels was genetically abrogated grew at rates comparable to wild-type cells.

Full text at www.sciencemag.org/cgi/content/full/335/6067/401-b

Response to Comment on "Dynamics of Dpp Signaling and Proliferation Control"

Ortrud Wartlick, Peer Mumcu, Frank Jülicher, Marcos González-Gaitán

Schwank *et al.* challenge the temporal growth model with an experiment in which Dpp signal transduction is abrogated. They claim that in this condition, cellular Dpp signaling levels do not increase over time but that cells do grow normally. We repeated this experiment and observed an increase of signaling over time. The results are consistent with a temporal model of growth control.

Full text at www.sciencemag.org/cgi/content/full/335/6067/401-c

ect grants and fellowships only sporadically, has instead called for grants and fellowships on an almost yearly basis. However, FCT grants have a limit of 200,000, typically for 3 years, including equipment, consumables, maintenance, travel, portions of salaries, and institutional overheads; most of these expenses are taxed with a 23% value-added consumption tax (which is not waived for publicly funded research costs, as in other EU countries). Because individual researchers can only be the principal investigators of two such projects at the same time, it is difficult to invest money in the purchase of large equipment. Unfortunately, the last call for specific re-equipment grants opened in 2001, with results in July 2004. The past decade also witnessed several delays on the receipt of contracted funds, and most of the host institutions lacked the capital necessary to buffer such delays.

Variability in the quality of Portuguese research is perpetuated by a system that allows unsuccessful research groups to continue, despite years (or even decades) without producing deliverables. Furthermore, some disciplines have not succeeded in

reaching the average level of output of their European colleagues.

Portuguese R&D still produces few academia-industry partnerships. Not many companies in Portugal have the size, capital, interest, and foresight to make research-oriented investments for the development of new and innovative products. Portuguese universities also suffer from historical social isolation, lack of focus on entrepreneurship in student training, and limited experience with new and emerging technology-transfer platforms. Most universities are now adopting policies to address these limitations, such as creating technology-transfer offices and including entrepreneurship in some curricula.

Due to the economic crisis, in 2011 faculty and researchers experienced a cut of more than 10% in annual income, with an additional 14% reduction already announced for 2012. Hundreds of researchers are working on 5-year contracts funded by the *Ciência 2007* and *Ciência 2008* initiatives of the former Ministry of Science, Technology, and Higher Education (MCTES). Initially, they hoped to be hired directly by their host institutions at the end of their contracts. However,

this is now unlikely considering that several Portuguese universities and research centers are already struggling to pay the salaries of their present employees and will face a new funding cut of 8.5% in 2012.

The change in government last June has added to the feeling of uncertainty. MCTES and the Ministry of Education have merged but, for the first time, this year's calendar for grants and fellowships calls has been published in advance. Nevertheless, the budget for these calls is still unknown.

The Portuguese research community is now facing its first "stress test" after the progress and consolidation of the past 15 years. Portugal-based researchers are highly qualified and will surely do their best to overcome these hurdles, and Portugal's institutions have the necessary facilities and intellectual environment to do good science. Now is the time for Portugal's science community to show that the country's "age of enlightenment" is not at an end.

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1. R. Stone, *Science* **291**, 1889 (2001).

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