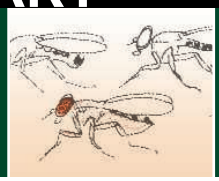

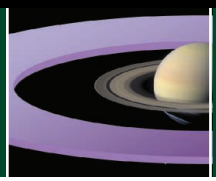

LETTERS

edited by Etta Kavanagh

Retraction

WE WISH TO RETRACT OUR RESEARCH ARTICLE "THE MRNA OF THE *ARABIDOPSIS* GENE *FT* MOVES from leaf to shoot apex and induces flowering" (*1*). After the first author (T.H.) left the Umeå Plant Science Centre for another position, analysis of his original data revealed several anomalies. It is apparent from these files that data from the real-time RT-PCR were analyzed incorrectly. Certain data points were removed, while other data points were given increased weight in the statistical analysis. When all the primary real-time RT-PCR data are subjected to correct statistical analysis, most of the reported significant differences between time points disappear. Because of this, we are retracting the paper in its entirety.

In new experiments, we have reproduced the floral induction caused by a heat-shock induction of *FT* in a single leaf, but we have failed to detect movement of the transgenic *FT* mRNA from leaf to shoot apex. We therefore retract the conclusion that *FT* mRNA is part of the floral inductive signal moving from leaf to shoot apex.

We deeply regret any scientific misconceptions that have resulted from the publication of these data.

The first author of the paper (T.H.) strongly objects to the retraction of the paper and has therefore declined to be an author of the retraction.

Our related *Science* Report on the *CO*/*FT* regulatory module in trees (*2*) is not affected by this Retraction. In this paper, T.H. was involved in the construction and analysis of the *PtCENL1* experiments reported in the Supporting Online Material. These data have been reevaluated and found to be correctly reported.

HENRIK BÖHLENIUS,[1] SVEN ERIKSSON,[1] FRANÇOIS PARCY,[2] OVE NILSSON[1]

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References

1. T. Huang, H. Böhlenius, S.Eriksson, F. Parcy, O. Nilsson, *Science* **309**, 1694 (2005).
2. H. Böhlenius *et al.*, *Science* **312**, 1040 (2006).

A Thank You from Tulane University

IT HAS BEEN 19 MONTHS SINCE HURRICANE Katrina slammed into the Louisiana coastline, causing widespread destruction and prolonged flooding in New Orleans. Gulf Coast institutions continue to deal with the aftermath of the hurricane, but great progress has been made in reestablishing a vibrant competitive research community. At Tulane University, we have experienced a level of rebound and renewal beyond our expectations. I write to express gratitude to the academic community for the strong support that we received both during and after the storm. Many institutions advised us and hosted our research faculty, with a particularly large number located at Alliance of South Texas Health Sciences Centers institutions (Baylor College of Medicine, University of Texas Health Science Center at Houston, Texas A&M Health Science Center School of Medicine, University of Texas Medical Branch at Galveston).

We owe a special debt of gratitude to our colleagues at the National Institutes of Health (NIH) and the National Science Foundation (NSF) for their unwavering moral and fiscal support at our time of greatest need. Within days, communication was established with senior administrators at the NIH, including Director Elias Zerhouni and Deputy Director Norka Ruiz-Bravo, and at the NSF, Director Arden Bement and Deputy Director Kathie Olsen. Both agencies established points of contact and procedures to address our needs. Five senior NIH officials visited Tulane University and other severely affected institutions in March 2006 to assess the effectiveness of the NIH response. A site visit by Bement in April 2006 was also very meaningful, as were the many Katrina-related supplements provided to NIH and NSF grantees at affected institutions. Finally, we are very grateful to the U.S. Office of Science and Technology Policy and the Office of Management and Budget, which issued a Joint Announcement soon after the storm establishing special procedures for affected institutions, including extensions of application and reporting requirement deadlines.

"The swift and effective response of the academic community and government agencies made it possible to preserve much of the competitive research enterprise at Tulane and provided moral support for their colleagues in New Orleans."

—Levy

The swift and effective response of the academic community and government agencies made it possible to preserve much of the competitive research enterprise at Tulane and provided moral support for their colleagues in New Orleans.

LAURA S. LEVY

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Astrobiology and Missions at NASA

IN HIS NEWS FOCUS ARTICLE "ASTROBIOLOGY fights for its life" (19 Jan., p. 318), A. Lawler describes NASA's astrobiology program as largely disconnected from its space-flight missions. But recent competitions paint a different picture. For example, Bruce Jakosky, the Principal Investigator (PI) of the Mars Atmosphere and Volatile Evolution mission (MAVEN), one of two candidates for the next Mars Scout, is also the PI of the NASA Astrobiology Institute's (NAI) University of Colorado team. MAVEN would study atmospheric gas escape from Mars to understand what effect atmospheric evolution has had on the planet's climate and habitability, placing that one piece of the puzzle into the larger context of the planet's biological potential. The NAI stimulates this kind of integrative thinking by bringing together broad, multidisciplinary groups of scientists who might not otherwise have the opportunity to work together and learn how to contribute to each other's research. MAVEN is an example of what can grow from this fertile ground.

The Mars Scout selections included two instrument development efforts for ESA's ExoMars mission, both of which are direct products of the NASA Astrobiology program. In addition, two PI instruments on the 2009 Mars Science Laboratory (MSL) received Astrobiology support to enable their selection for flight. NAI current and former PIs and Co-Investigators are centrally involved in operations and science analysis for the Mars Exploration Rovers, Spirit and Opportunity.

The NAI also contributes to future missions through Focus Groups that mobilize expertise from across the Institute and the wider scientific community. The Mars Focus Group began by playing a seminal role in restructuring the Mars Program after the loss of NASA missions launched in 1998. It accomplished this by organizing astrobiology community input to NASA's Mars Exploration Program Analysis Group (MEPAG). Two NAI PIs have served as MEPAG Chair. The NAI Europa and Titan Focus Groups have also provided input to mission planners studying those opportunities, and the Astronomy Focus Group has provided an analysis of the astrobiology potential of the James Webb Space Telescope. Rather than being disconnected from NASA flight opportunities, astrobiology objectives and the astrobiology community are repeatedly found at the heart of NASA's missions.

CARL B. PILCHER

Director, NASA Astrobiology Institute, NASA Ames Research Center, Moffett Field, CA 94035, USA.

Letters to the Editor

Letters (~300 words) discuss material published in *Science* in the previous 3 months or issues of general interest. They can be submitted through the Web (www.submit2science.org) or by regular mail (1200 New York Ave., NW, Washington, DC 20005, USA). Letters are not acknowledged upon receipt, nor are authors generally consulted before publication. Whether published in full or in part, letters are subject to editing for clarity and space.

Oocyte Donation for Stem Cell Research

THE NEWLY ISSUED INTERNATIONAL SOCIETY for Stem Cell Research (ISSCR) guidelines for human embryonic stem cell research (G. Q. Daley *et al.*, Policy Forum, 2 Feb., p. 603) include worthy goals and lofty language about truth and transparency in biomedical research, dissemination of research benefits "to humanity at large on just and reasonable terms," and discussion of enhancing the informed consent process for the procurement of tissues and gametes (*1*).

But the guidelines would in fact weaken important ethical standards that have already been established. We are particularly concerned about the recommendation that decisions about paying women for their eggs should be left to mostly local oversight committees.

This is a complex social and ethical question. Many who have examined the issue closely, including ourselves, have concluded that researchers should compensate women only for their direct expenses, to avoid inducing economically vulnerable women to accept the significant risks of egg retrieval when they would not otherwise be willing to do so. This perspective has been adopted as law in California and a number of countries, and it is recommended in the U.S. National Academies guidelines. In other words, the ISSCR is now suggesting that governments and agencies abdicate their role to protect the health and safety of women in favor of a patchwork of inconsistent and opaque decisions made by local committees.

Members of the ISSCR group justify weakening the rules on egg procurement by citing "cultural and political differences" (*2*). This is an unhelpful relativism that could all too easily endorse a kind of "tissue tourism," in which researchers arrange to obtain women's eggs wherever the rules are most lax.

This prospect, and emerging inconsistencies among standards for stem cell research, point to the need for binding rules to ensure that stem cell and other biotechnologies are developed and used in ways that truly support, rather than actually undermine, health and well-being.

MARCY DARNOVSKY[1] AND SUSAN BERKE FOGEL[2]

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References

1. See ISSCR guidelines at www.isscr.org/guidelines/index.htm.
2. A. Pearson, "New international guidelines for stem cell science," NewScientist.com news service, 1 Feb. 2007 (see www.newscientist.com/article.ns?id=dn11084&feedId=online-news_rss20).

AS EVIDENCED BY THE POLICY FORUM "THE ISSCR guidelines for human embryonic stem cell research" (G. Q. Daley *et al.*, 2 Feb., p. 603), countries with public policies on the donation of surplus embryos for stem cell research broadly agree on the need for a fully informed consent and the avoidance of conflicts of interest. Quality assurance, therapeutic purpose, transparency, confidentiality, traceability, and ethics review are also common ground. However, there is less agreement regarding the retrieval and use of human oocytes for stem cell research. The recently released ISSCR guidelines attempt to fill this gap, but, in an attempt to reach consensus, it resorted to a vague, unclarified prohibition of "undue inducement" regarding compensation of oocyte donors.

The use of financial incentives to obtain human oocytes to be used in stem cell research is a contentious issue. Are participating women vendors, providers, or donors? That depends on the type of compensation. Currently, there are five models of compensation: free market, pure gift, fixed compensation, minimum wage, and reimbursement of expenses. The free-market model is likely to prevail in the absence of sufficient debate and decision-making by governmental authorities around the world. Its obvious advantage is the high rate of recruitment given the increasing scarcity of access to human oocytes. Yet, this approach can result in commodification, undue inducement (if not coercion of the vulnerable), and commercialization. At the opposite extreme is an altruistic gift, which is likely to be rare, considering the invasive procedures involved and the unknown long-term health risks of ovarian hyperstimulation.

International debate is sorely lacking for the other three models. The fixed compensation model provides for a standardized amount irrespective of the financial costs to

the donor, socioeconomic status (i.e., need), or time and inconvenience. This model prevents monetary inducements as a primary motivation and minimizes financial loss to the donors, but ignores individual expenses. Although arbitrary, it has the advantage of certainty and, in a societal sense, fairness. The minimum-wage approach takes into account the number of hours donated. In all likelihood, providing a minimum wage would result in a higher rate of payment than the fixed compensation model. Reimbursement of expenses seems to be a more individually tailored approach. This depends, however, on whether reimbursement is for inconvenience, time, pain, and discomfort, or is limited to actual receipted expenses such as travel, lodging, parking, meals, and daycare. There are limited incentives for donors and, in practice, the administrative proof required is burdensome. A narrower receipted expenses–only policy will in the long term further reduce the availability of these materials. This could result in commercial importation or a black market. Some would see the current "exceptional" case in the U.K. of egg donation for research in exchange for access to fertility treatment as a variation of the reimbursement model. This approach, however, is akin to providing access to drugs or treatments in clinical trials and does not parallel the healthy volunteer guidelines in international guidelines for biomedical research.

Perhaps a more equitable solution would be to develop a mixed model in which a standard amount of compensation would be determined by a competent authority, but would also include reimbursement for time and effort expended for procurement. Were such an approach to be adopted internationally, the additional issue of forum shopping (selecting a procurement site on the basis of the particular laws in effect there) may be lessened. The International Stem Cell Forum Ethics Working Party maintains that this approach respects altruism and solidarity. The amount will still largely remain a symbolic recognition of the true value of such participation in stem cell research. It provides a feasible solution to an issue that needs to be examined within the larger context of the participation in and ethical oversight of biomedical research.

FOR THE INTERNATIONAL STEM CELL FORUM ETHICS WORKING PARTY: BARTHA MARIA KNOPPERS,[1] MICHEL REVEL,[2] GENEVRA RICHARDSON,[3] JOSEF KURE,[4] SALLA LÖTJÖNEN,[5] ROSARIO ISASI,[1] ALEXANDRE MAURON,[6] JAN WAHLSTROM,[7] BRACHA RAGER,[8] PENG LEE HIN PENG[9]

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Response

DARNOVSKY AND FOGEL RAISE APPROPRIATE concerns that oocyte donation should not fall disproportionately on economically vulnerable women and that research guidelines should prohibit "tissue tourism." The ISSCR guidelines directly address these concerns. The introduction to section 11 ("Procurement of materials") clearly states: "Consistent with well-established principles of justice in human subject research, there must be a reasonable relationship between those from whom such materials are received and the populations most likely to benefit from the research," and section 11.5b reads: "There must be monitoring of recruitment practices to ensure that no vulnerable populations, for example, economically disadvantaged women, are disproportionately encouraged to participate as oocyte providers for research."

Furthermore, the guidelines articulate the core principle that there be a "rigorous review to ensure that reimbursement of direct expenses or financial considerations of any kind do not constitute an undue inducement." Research that is subject to a rigorous oversight process at the local, regional, or national level—as stipulated in the ISSCR guidelines—and conducted in accordance with these guiding principles will avoid the exploitation of women that is our shared concern.

The Letter from the Ethics Working Party (EWP) of the International Stem Cell Forum acknowledges that women should be free from "undue inducement" when making decisions regarding the donation of oocytes for research, and outlines a proposal that if approved through a rigorous process of review and subject to appropriate oversight would be consistent with ISSCR guidelines. The EWP Letter correctly highlights the difficulties in defining what constitutes allowable expenses and the need to guard against the disproportionate recruitment of economically disadvantaged women, and illustrates the complexity of the deliberations required to arrive at a reasonable policy for engaging women in research.

The ISSCR task force comprised scientists, ethicists, and legal experts from 14 countries. Despite the inevitable political, cultural, and religious differences that shape research policy internationally, our task force reached consensus on guiding principles for the conduct of human embryonic stem cell research. The ethical principles pertaining to oocyte donation are particularly challenging and continue to prompt debate and inquiry. The ISSCR guidelines encourage an open and ongoing dialogue concerning ethical procurement of human materials for stem cell research, and will be subject to review and refinement as more information becomes available.

GEORGE Q. DALEY

Chair, ISSCR Guidelines Task Force, and Children's Hospital, Boston, MA 02115, USA.

CORRECTIONS AND CLARIFICATIONS

News of the Week: "Mapping the 248-fold way" by D. Mackenzie (23 Mar., p. 1647). On page 1649, the story listed Hermann Nicolai's affiliation as the University of Potsdam. Nicolai is at the Max Planck Institute for Gravitational Physics (Albert Einstein Institute) in Potsdam.

Table of Contents: (2 Feb., p. 565). The one-sentence summary for the Report "Structural and regulatory genes required to make the gas dimethyl sulfide in bacteria" by J. D. Todd *et al.* was incorrect. It should read, "A bacteria gene is found that enables cleavage of DMSP to the volatile sulfur compound dimethyl sulfide (DMS) involved in cloud nucleation and hence reduction in global warming."

Books *et al.*: "Otherness—When killing is easy" by C. Ash (2 Feb., p. 601). The image on the far right is not John Burdon Sanderson Haldane, as identified in the caption, but is instead his father, John Scott Haldane.

TECHNICAL COMMENT ABSTRACT

COMMENT ON "Ongoing Adaptive Evolution of *ASPM*, a Brain Size Determinant in *Homo sapiens*"

Fuli Yu, R. Sean Hill, Stephen F. Schaffner, Pardis C. Sabeti, Eric T. Wang, Andre A. Mignault, Russell J. Ferland, Robert K. Moyzis, Christopher A. Walsh, David Reich

Mekel-Bobrov *et al*. (Reports, 9 September 2005, p. 1720) suggested that *ASPM*, a gene associated with microcephaly, underwent natural selection within the last 500 to 14,100 years. Their analyses based on comparison with computer simulations indicated that *ASPM* had an unusual pattern of variation. However, when we compare *ASPM* empirically to a large number of other loci, its variation is not unusual and does not support selection.

Full text at www.sciencemag.org/cgi/content/full/316/5823/370b