

LETTERS

edited by Jennifer Sills

Retraction

AFTER ONLINE PUBLICATION OF OUR REPORT “GENETIC SIGNATURES OF EXCEPTIONAL LONGEVITY IN HUMANS” (1), we discovered that technical errors in the Illumina 610 array and an inadequate quality control protocol introduced false-positive single-nucleotide polymorphisms (SNPs) in our findings. An independent laboratory subsequently performed stringent quality control measures, ambiguous SNPs were then removed, and resultant genotype data were validated using an independent platform. We then reanalyzed the reduced data set using the same methodology as in the published paper. We feel the main scientific findings remain supported by the available data: (i) A model consisting of multiple specific SNPs accurately differentiates between centenarians and controls; (ii) genetic profiles cluster into specific signatures; and (iii) signatures are associated with ages of onset of specific age-related diseases and subjects with the oldest ages. However, the specific details of the new analysis change substantially from those originally published online to the point of becoming a new report. Therefore, we retract the original manuscript and will pursue alternative publication of the new findings.

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References and Notes

1. P. Sebastiani et al., *Science*, 10.1126/science.1190532 (1 July 2010).
2. This Retraction supersedes the Editorial Expression of Concern published on 12 November 2010 [B. Albers, *Science* **330**, 912 (2010)].

Invasives: A Major Conservation Threat

A FLURRY OF RECENT ARTICLES CALL UPON THE conservation community to embrace invasive species. Davis and coauthors propose downsizing the struggle against invasives (1). In the News Focus story “Embracing invasives” (18 March, p. 1383), G. Vince suggests that the Galápagos “embrace the aliens.” In *The New York Times* (2), H. Raffles accused environmentalists, conservationists, and gardeners targeting invasive species of being unreasonably dogmatic and xenophobic.

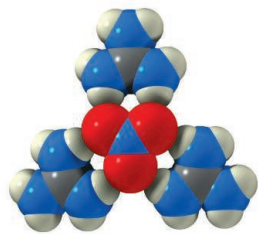
These articles imply that the concern with invasive species derives from the unreasonable desire to maintain pristine ecosystems and exclude all alien species. In fact, conservationists recognize that species distributions are constantly changing, that community structure is dynamic, that alien species enter and are introduced into natural communities, and that modified (and even degraded) ecosystems have conservation value. However, we also recognize an important distinction between alien species in general—which are introduced outside their natural range by humans, but which in many cases are harmless—and invasive species, which

by definition not only are introduced outside their range but also cause substantial harm to biodiversity and human livelihood. Invasive species, not alien species, are indeed a major cause of biodiversity loss, implicated in the majority of extinctions (3), and this trend continues. Thus, they deserve aggressive intervention.

As leaders of conservation organizations with missions to protect biodiversity, we believe that the endorsement of invading species—although potentially stimulating from an academic perspective—risks trivializing the global action that is needed to address one of the most severe and fastest growing threats to biological diversity. As recently noted by many leading scientists (4–8), as well as by the IUCN SSC Invasive Species Specialist Group (9), practitioners combating invasive species use a suite of strategies to prevent the arrival of invasives and to mitigate their impacts after arrival. Our organizations have promoted biosecurity programs, implemented dozens of campaigns for invasive species removal, and supported hundreds of the more than 1000 eradication so far completed, recovering ecosystems and preventing many extinctions worldwide, especially on islands. These successes demonstrate clearly that threats from invasive species can be mitigated and that biodiversity can be protected through these actions. Tackling invasives also addresses the economic damage they cause and the serious threats they pose to human communities, for example, through reducing access to food and

Letters to the Editor

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water or spreading diseases.

At the Convention for Biological Diversity meeting in Nagoya, Japan, in October 2010, 193 countries adopted a historic Strategic Plan for Biodiversity for 2011–2020, setting a target to prevent, control, and eradicate the most harmful invasive species by 2020. Our organizations will be in the front line to achieve this target, and we encourage countries and communities to support and contribute to this effort.

Now more than ever, academics should be supporting action against invasive species, identifying tomorrow's most damaging invaders to enhance prevention, and working actively to develop innovative tools to control, eradicate, or mitigate the impacts of the most harmful invaders.

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9. Invasive Species Specialist Group (ISSG), "We need to strengthen, not weaken, the struggle against harmful invasive species" (2011); www.issg.org/pdf/rebuttal.pdf.

Dolphin Research: Arguing Against Captivity

I WOULD LIKE TO RESPOND TO M. MENARD'S statements ("Dolphin research: Continue captivity," Letters, 24 June, p. 1501) about the News Focus story "Are dolphins too smart for captivity?" (D. Grimm, 29 April, p. 526).

Menard claims that the research we propose with lone, sociable, and habituated wild dolphins would be prohibited under the Marine Mammal Protection Act (MMPA) (1). In fact, the MMPA prohibits harassment and feeding of wild dolphins but provides permits for scientific research (see MMPA, section 104).

Menard argues that "Marino is also wrong on dolphin life spans" and goes on to claim that dolphin life spans are twice as long in captivity as in the wild. However, the papers that Menard cites to support her claim do not provide data relevant to her conclusion; they cite life stage and growth data from wild, stranded dolphins during an unusual high-mortality event and make no comparisons to captive dolphins (2, 3). In contrast, there is evidence that captivity shortens life spans (4, 5).

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Blame Testing, Not Teachers

IN HER EDITORIAL "EDUCATION IS NOT A RACE" (24 June, p. 1481), D. Stipek faulted science teachers for teaching to the test. Teachers, however, are constrained to address the terms of their employment. The preoccupation with testing lies instead with school administrators who have an impoverished model of job performance, with state legislators and education departments who mandate and write the tests, and with national legislation that links funding to school performance on trivial factoid tests. Change the tests and free the teachers; then science education will blossom.

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TECHNICAL COMMENT ABSTRACTS

Comment on "Activation of β -Catenin in Dendritic Cells Regulates Immunity Versus Tolerance in the Intestine"

Kenneth M. Murphy

Manicassamy *et al.* (Reports, 13 August 2010, p. 849) deleted β -catenin in intestinal immune cells using a CD11c-driven Cre recombinase, which decreased anti-inflammatory mediators and increased inflammatory bowel disease. However, the deletion of β -catenin in macrophages remains a caveat to their interpretation that Wnt signaling programs dendritic cells into a tolerogenic state. Development of strains expressing Cre in a more finely lineage-restricted pattern may help resolve this issue.

Full text at www.sciencemag.org/cgi/content/full/333/6041/405-a

Response to Comment on "Activation of β -Catenin in Dendritic Cells Regulates Immunity Versus Tolerance in the Intestine"

Santhakumar Manicassamy and Bali Pulendran

Murphy argues that deletion of β -catenin in macrophages is a caveat to our interpretation that Wnt signaling programs dendritic cells (DCs) into a tolerogenic state in the gut. However, our data demonstrate that β -catenin-deficient DCs are greatly impaired in inducing regulatory T cells, and induce enhanced T helper 17 (TH17)/TH1 responses. Assessing the relative importance of DCs versus macrophages in intestinal tolerance must await tools that permit the genetic deletion of the numerous DC and macrophage subsets in the intestine.

Full text at www.sciencemag.org/cgi/content/full/333/6041/405-b

