LETTERS

edited by Etta Kavanagh

Crucial Choices for the Nascent ERC

THE DIVERSE SCIENTIFIC COMMUNITIES SUPPORTING THE INITIATIVE FOR SCIENCE IN EUROPE (ISE) welcome the steps taken toward establishing the European Research Council (ERC), notably, the appointment of a Scientific Council of 22 outstanding scientists. Many important decisions must be taken in the coming months to ensure that the ERC meets the high expectations of the community as a truly autonomous agency that funds fundamental research in all disciplines on the basis of scientific excellence, while guaranteeing that the public funding provided for it will be prudently managed.

The choice of legal structure for the ERC will be vital. An "Executive Agency," established and staffed predominantly by employees of the European Commission (EC) recruited through open competition and detachment, is one option; the alternative is a structure that is independent of the EC but in which all member states are represented. The ISE agrees with the pragmatic choice of an Executive Agency structure, at least for the start-up phase of the ERC, with the possibility of changing the legal structure following an independent assessment after 3 to 5 years.

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Despite the Commission's role in establishing the agency, the ERC must be substantially independent of the EC and, crucially, must be allowed to function outside the standard procedures of the Framework Programmes. In this regard, the leading role of the new Scientific Council must be rigorously respected; the Executive Agency must act under the authority of the Scientific Council. As a consequence, it appears imperative to us that the choice of the director of the Executive Agency must be based on proposals made by the Scientific Council. The alternative, whereby the EC chooses the key officers, would put at risk the trust between the Scientific Council and the Executive Agency that will be essential to earn, in turn, the trust and respect of the wider scientific community.

The new ERC has the opportunity to engage European researchers in a way that the Framework Programmes have so far failed to do. The Executive Agency must grasp this opportunity by choosing procedures that best serve the needs of science in Europe: Applications must be evaluated solely on scientific merit, the application and reporting procedures must not overburden scientists with administration, and funding must be through grants, like those of the national funding agencies, rather than, as is currently the case in the Framework Programme, through contracts with rigid deliverables and milestones, which are counterproductive to the unpredictable frontier research.

Finally, although no decision on the level of financing of the next Framework Programme has been announced, we know that budget negotiations point to a significant reduction in funds for research by the European Union, possibly including the ERC. In any event, the ERC must have a budget that is commensurate with the important task in hand—to stimulate basic research and increase the competitiveness of Europe. This budget should be at least €1 billion per year in the first years and grow quickly to €1.5 to 2.0 billion per year (the size of the larger national research council budgets) within the 7-year Framework Programme. A smaller budget than this could seriously undermine the ERC. Funding of this magnitude, i.e., at least €9 billion, should be earmarked for the ERC in the Framework Programme budget.

The temptation to reduce ERC funding to protect existing actions, however valuable, or to transfer to the ERC the charge of delivering other parts of the Framework Programme (without the associated budget) must be resisted. If the budget is inadequate, the success rate of applications will be too low, many important projects will not be funded, and the best researchers will not apply for grants or participate in the peer review process. All of these would doom the nascent ERC.

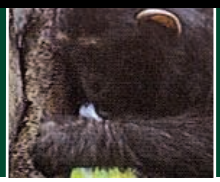
THIS LETTER IS ENDORSED IN A PERSONAL CAPACITY BY THE PRESIDENTS, CHAIRS, AND DIRECTORS GENERAL OF 57 EUROPEAN ORGANIZATIONS IN ALL SCIENTIFIC DISCIPLINES UNDER THE AEGIS OF THE INITIATIVE FOR SCIENCE IN EUROPE (FOR FURTHER INFORMATION, SEE WWW.INITIATIVE-SCIENCE-EUROPE.ORG). THE COMPLETE LIST OF SIGNATORIES IS AVAILABLE AT WWW.SCIENCEMAG.ORG/CGI/CONTENT/FULL/311/5765/1240B/DC1.

Objectivity in Science

OBJECTIVITY IS A CORNERSTONE OF SCIENCE. Bias can erode objectivity when unwittingly introduced into the reporting and teaching of discoveries and theories. This is evident in articles and books on evolution today and may contribute to difficulties in the acceptance of evolution by many supporters of intelligent design.

Science has not yet developed to the point of being able to assign purpose to activities in the natural world. In fact, it may never develop to that level. Yet purpose is often implied in descriptions of DNA replication, and this introduces bias.

Scientists generally agree that there is no purpose in evolution. The evolutionary process moves along as a result of interactions among and between components of various levels of organization: populations, organisms, molecules, atoms, and subatomic particles and


A helping hand
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Early Mesoamerican writing
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waves. If purpose does exist, its discovery is outside the realm of science at this time.

Describing the production of a mutation, such as a DNA strand with a base sequence not complementary to the template strand at each base point, as an "error" or "mistake" unwittingly ascribes purpose to the process. It introduces the assumption that a new strand is "supposed" to be complementary to the template strand at each base point. Such a biased assumption is outside the realm of science. One could just as easily assume that a new complementary strand is not supposed to be an exact complement, but rather a source of variation. This assumption is also outside the realm of science.

Base-pairing during replication occurs as a result of natural attractions and repulsions between partially charged components of the bases. This is true if the new strand becomes an inexact complement just as much as it is true if the new strand becomes an exact complement. An inexact complement should not be considered a "mistake."

This may appear trivial at first glance, because scientists often communicate among themselves informally, using purposeful language while not intending a literal interpretation (e.g., elements try to achieve an outer octet of electrons). The danger lies, however, in the use of such informal language in articles and books intended for nonscientists, including textbooks used in high schools and colleges. When mutations are not presented as natural phenomena, but rather as "mistakes," it becomes difficult for a nonscientist to view them objectively.

Many supporters of intelligent design find discomfort in the concept that humans have evolved as a result of "mistakes." Although it is not an obligation of scientists to address discomfort in concepts, it is an obligation of scientists to present findings in an objective, scientific manner. Presenting mutations as "mistakes" should not be avoided due to any discomfort that may occur. Presenting mutations as "mistakes" should be avoided simply because such a presentation does unwittingly introduce purpose, and hence bias, to the concept. People being presented with the case for evolution should be allowed to evaluate objective arguments, without having first to overcome what they may consider a negative bias, when that bias should not have been introduced in the first place.

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Influenza Mutation from Equine to Canine

IN THEIR REPORT "TRANSMISSION OF EQUINE influenza virus to dogs" (21 Oct. 2005, p. 482), P. C. Crawford *et al.* observed an unprecedented interspecies transfer of a complete equine influenza virus to the dog and the emergence of a new canine-specific influenza virus associated with acute respiratory disease. They noticed that a viral hemagglutinin (HA), a critical determinant of host species specificity of influenza virus, differs mainly in four residues (N83S, W222L, I328T, and N483T) between the equine and canine HA orthologs, out of which only one (W222L) is exposed to the serum and is most likely involved in receptor binding. Our analysis revealed an additional important mutation (N54K) located in the antibody-binding region of HA (*1*). This residue is highly conserved in all noncanine (94) HA sequences of the subtype H3N8 (see multiple sequence alignment at http://mvg.bioinfo.pl/supplemental). In contrast, a leucine residue observed in the canine HA at position 222 is also present in three equine orthologs deposited in GenBank. The figure presents a comparison of the three-dimensional models of the equine and the canine HAs created with 1HA0 (*2*) and 1KEN (*3*) structures as templates. Highlighted areas show that the N54K mutation changes the electrostatic potential on the protein surface significantly. Moreover, it is placed in the middle of an N glycosylation motif (Asn-X-Ser) and likely increases the probability of the posttranslational modification of the preceding asparagine (*4*). The glycosylation of HA has been shown to enable the virus to mask its antigenic sites (*5*). We suggest that this mutation may help the virus escape the dog's immune defense and may be part of the minimal repertoire of changes required for the host specificity transition in the observed case.

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References and Notes

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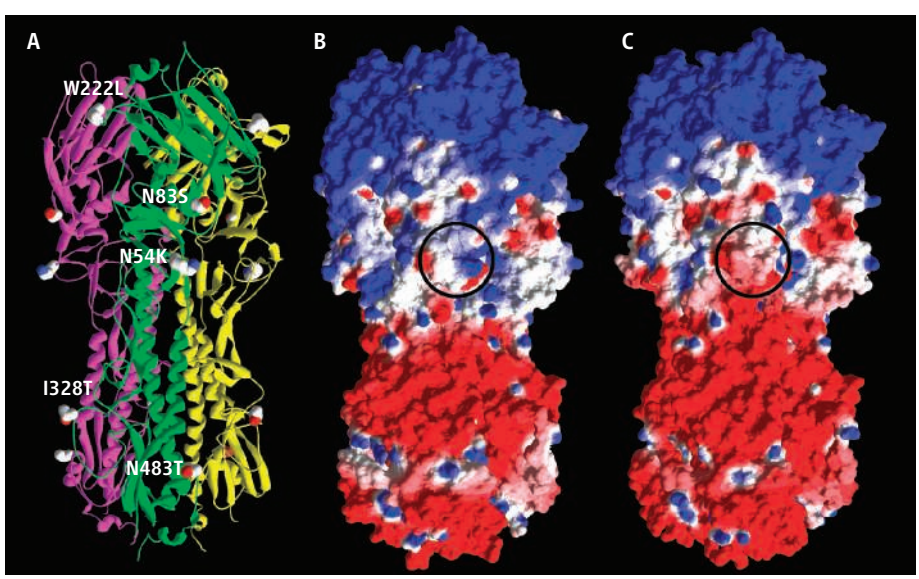
6. M.v.G. is a fellow of Foundation for Polish Science.

Response

GLYCAN CAMOUFLAGING OF HA ANTIGENIC sites is certainly a successful strategy of the human influenza virus in evasion of antibody responses elicited by previous influenza infections in adult populations. Canine influenza is a newly emerging pathogen and dogs are immunologically naive to the virus. Without the selective pressure applied by preexisting antibodies, the role of the amino acid substitution at position 54 in virus escape from antibody neutralization is probably not as important in either adaptation to or maintenance of the virus in the canine population at this time.



The ribbon representation (**A**) and the protein surface colored by electrostatic potential (**B**, **C**) of 3D models of the canine (A, B) and the equine (C) influenza hemagglutinins. Five dog-specific mutations are marked (A) with visible amino acid side chains. Highlighted areas (B, C) show the highest differences in electrostatic potential caused by the N54K mutation. This picture was created with Swiss PDB Viewer.

We agree with von Grotthuss and Rychlewski that, in addition to the four amino acid substitutions we described, the N54K substitution in the HA may have contributed to the successful transfer of equine H3N8 virus to the dog. However, the effects of these amino acid mutations on HA function are undefined and are likely multifactorial. It will be very interesting to monitor the evolution of these five sites of the HA as the virus becomes endemic in the dog population and herd immunity develops from infection or vaccination.

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CORRECTIONS AND CLARIFICATIONS

News Focus: "New neurons strive to fit in" by G. Miller (17 Feb., p. 938). Two names are misspelled in the photo credit on page 938. The correct credits are Verónica Piatti, Nicolás Morgenstern, and Alejandro F. Schinder. In the diagram on page 939, the labels "GABA input" and "Glutamate input" are reversed. GABA should be yellow, and glutamate should be blue.

Reports: "A clonogenic bone marrow progenitor specific for macrophages and dendritic cells" by D. K. Fogg *et al.* (6 Jan., p. 83). The affiliations were incorrectly numbered. The complete correct author list and affiliation list follow: Darin K. Fogg,[1] Claire Sibon,[1] Chaouki Miled,[1] Steffen Jung,[2] Pierre Aucouturier,[3] Dan R. Littman,[4] Ana Cumano,[5,6] Frederic Geissmann[1,7]

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Policy Forum: "Social values and the governance of science" by G. Gaskell *et al.* (23 Dec. 2005, p. 1908). The table referred to in the following sentence was not the one on p. 1909, and it is now included in the SOM as table S2: "The distribution of people in the United States, Canada, and Europe who opted for each principle of governance is shown in the table (p. 1909)."

Research Articles: "Animal evolution and the molecular signature of radiations compressed in time" by A. Rokas *et al.* (23 Dec. 2005, p. 1933). The list of supporting online material did not appear at the end of the reference list. It should read as follows:
Supporting Online Material
www.sciencemag.org/cgi/content/full/310/5756/1933/DC1
Materials and Methods
Figs. S1 to S8
Tables S1 to S8
References

This Week in Science: "Turning slightly faster" (26 Aug. 2005, p. 1297). The last sentence of this item is incorrect. It should read: "A systematic offset in seismic waves that pass through the inner core demonstrates that it is indeed rotating faster than the rest of the planet by about 0.3 degrees to 0.5 degrees per year."

Letters to the Editor

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