LETTERS

Hard questions

Convergent evolution at the molecular level is said to be one source of some "misleading phylogenetic analyses." Researchers discuss the "sanctuary problem," in which HIV persists in the brain even after it has been eradicated in other organs [yellow indicates concentration of HIV RNA in lymph nodes before (upper) and after (lower) treatment]. The challenge of designing studies to "test" the efficacy of prayer is reconsidered. And the relation between "economic consumption" and "environmental quality," and how these might be defined, is addressed.

CAVERT *ET AL.*

"Misleading" Molecules?

In the article "Morphologists learn to live with molecular upstarts" by Michael Balter (Research News, 16 May, p. 1032), one section entitled "Misleading molecules" quotes Colin Patterson as saying that Gavin Naylor's presentation (demonstrating that "wrong" phylogenetic trees can be derived from molecular sequence data) received "the closest thing to a standing ovation." This demonstration, and others like it [for example (*1*)], should bring only cold comfort to detractors of molecular data, as the emerging message is not that molecular data are invalid in some way. Rather, phylogenetic analyses can be misleading if they do not incorporate our growing knowledge of the variable constraints on evolutionary change at the molecular level. Thus, the section might more appropriately have been entitled, "Misleading phylogenetic analyses in which all characters are given equal weight," as the molecules themselves do not mislead. We see instead human error in the failure to discriminate between character similarity among taxa due to convergence and that due to common descent.

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References

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Treating AIDS Dementia

I read with interest the elegant report by Ashley T. Haase's group (W. Cavert *et al.*, Reports, 9 May, p. 960) and the accompanying News article by Jon Cohen (9 May, p. 898) concerning the vulnerability of reservoirs of human immunodeficiency virus (HIV) stubborn to new treatments. The work by Haase and his colleagues, as well as related works (*1*), are crucial to the systemic treatment of AIDS. However, an important issue not dealt with is the reservoir of virus within macrophages and microglia in the brain. HIV-1 enters the brain very early after initial infection (*2*). The newer triple-drug combination therapies, which include protease inhibitors, are, in general, not capable of crossing the blood-brain barrier and eradicating infection in the central nervous system. Among these drugs, AZT alone may penetrate the brain to some degree, but its effects on the dramatic cognitive decline are manifest in about one-third of patients, who develop so-called AIDS dementia, level off, or fail after about 3 months of treatment (*3*).

For this reason, the Neurology Core Committee of the AIDS Clinical Trials Group (ACTG), of which I am a member, has designed adjunctive drug strategies to be piggybacked onto the best antiretroviral therapy in an effort to abort or even prevent AIDS dementia. Currently held models of HIV-induced neuronal damage are predominantly focused on neurotoxins that emanate from infected or immune-stimulated brain macrophages and astrocytes, which in turn overstimulate the N-methyl-D-glutamate (NMDA) subtype of glutamate receptor in the brain (*2*). This leads to excessive $Ca2^{+}$ influx, free radical formation, and neuronal injury or apoptosis. One clinically tolerated NMDA antagonist, memantine, has recently entered a phase-II/III ACTG study, and it is hoped that this form of adjunctive therapy will prove useful to AIDS patients with cognitive decline. After all, who wants to live longer because of