HIV mutation rate

The human immunodeficiency virus (HIV) evolves at a rate about a million times as great as that of esukaryotic DNA genomes. This ratio reflects the number of substitutions at any given site per generation. The measured average rate per site for the HIV-1 reverse transcriptase is between 10^{-15} and 10^{-14} (refs 2,3). This implies that the reverse transcriptase makes on average 1-10 errors during the replication of the HIV genome (10 bases). This high mutation rate might be an important factor for the virus to escape destruction by the immune system.

An interesting feature of HIV-1 infections is the rate genetic variability found in virus populations. Sequencing variants isolate the same infected patient at different points in time. The peak of this radiocarbon date occurred around 500 years ago, coinciding with the maximum transgression of the European continent, and declined during a subsequent regression. A return to more phonghonic conditions and higher stable isotope ratios during and after this radiocarbon date important questions about the role of nutrient excess in evolution, like that currently destroying coral reefs.

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Erratum
In the Scientific Correspondence "The law beats Maxwell's demon" by Paul A. Samuelson (Nature 347, 24–25; 29 September 2000) the equation

\[ D[x, 1/2] = \sqrt{x} \]

should have read

\[ D[1/2, x] = x \]

for \( x < 0 \).

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Radiating bodies

SIR—H. A. J. Oreskes (Nature 347, 24; 1990) describes a procedure for driving sensible energy from a cooler body to a hotter body, in contradiction of thermodynamics. This is done by the use of a mirror to focus radiation from the cooler body A onto the surface of the hotter body B. This procedure will fail. If the only radiating bodies involved were the bodies A and B, then body B would radiate heat back to body A faster than A radiates to B, so bringing the two bodies to the same temperature, as required by thermodynamics. It would be necessary in practice to combine both A and B by additional surfaces, but in order that these would make no net contributions to the energy exchanges between A and B, these would have to be at the same temperature as A and B.

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