HIV in infected lymph nodes

Sir — To answer questions raised by Upton & Wain-Hobson about functional and scientific sense by Phillips et al., concerning the quantification of HIV RNA (detected by in situ hybridization) in the germinal centres of lymph nodes of HIV-infected individuals, we constructed a test object containing a known number of HIV viral particles in a fibrin clot. This sample is identical to infected tissue specimens and examined histologically after in situ hybridization. Phalloidin-conjugated rhodamine isoelectrophor representation about the kairoses of the HIV-1 genome. An equivalent sens probe control is used to subtract background from consecutive sections of the test object and of the tissues. Tissue specimens are digested with protease to remove protease-sensitive viral particles. The amounts of hybridization are detected by phos- phorimaging the microscope slides in a Fuji BAS 2000 instrument.

Calculations show the test object to cover in the range of 2.0 to 2.4 µm in 6-µm section. Based on a comparison of 1.60-µm-thick histogram of the test object with equal areas of lymph-node germinal centres showing maximum intensity of HIV RNA in the germinal centres in particles in a germinal centre to be as much as 100,000 virus particles per µm². Because about 20% of the infected lymph nodes is occupied by germinal centres in HIV-infected individuals (C.H.F., unpublished data), an entire lymph node may contain of the order of 1 000 000 virus particles. The amount of viral RNA appears to remain relatively constant in the germinal centres of lymphoid tissues in sequential biopsies. We have examined more than 300 biopsies from individuals who had been infected for different periods of time (including, 10 people and alone when lymphoid aggregates grow, the time the antigens against HIV to 10 years and to be infected in the germinal centres in the late stages of AIDS. A similar circumstance occurs in other primates infected with HIV. In reply to questions regarding the infectious nature of such viruses, we refer readers to a series of relevant papers by the late Albert Sabin, in which he reported experiments showing that viruses that had been reacted with antibodies retain their infectivity in tissues. It seems reasonable to us that CD4-expressing T lymphocytes become infected following cell-to-cell contact with the virus, as the cells traffic through lymphoid germinal centres. There may also be loss of CD4 expression when infected T cells leave the germinal centre. Projected over years, the rate of T-cell replacement falls behind the death and, combined with loss of cell populations and the development of the microenvironment of the germinal centre arising from the infection, the balance of both structure and function in the immune system is catastrophically altered. We believe that the enteroviruses targeted to the germinal centres, combined with some element, of follicular dendritic cell function and T-cell kinetics, is the explanation for the extremely slow but inexorable progression of the primate lentivirus disease.

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Motion extrapolation in catching

Sir — Many studies investigate how observers might compensate for the latency due to bodily movement while executing actions such as catching a ball. But success in such interceptive behaviour depends on the observer having accurate information about the ball’s initial location. This raises a question which has received surprisingly little attention. How does the visual system compensate for latency in the transmission of motion information from receptors to ‘higher’ visual areas of the brain? The problem is serious because the typically estimated delay (t) of about 100 ms (ref. 1) would cause an object moving at 30 m.p.h. to appear retracted by 4.4 feet in its trajectory. An effect first observed by MacKay and later rediscovered in our laboratory2 in the following form, suggests an answer. A single white line is rotated against a black background (see a in the figure). The line consists of one continuously illuminated segment and two stroboscopic segments reporting a compelling effect. The stimulus is a single physical slit 0.39 long rotating at 240 r.p.m. against a dark background. The central 1.3 cm of the slit was continuously illuminated (solid line) and the outer two 1.3 cm segments were strobosed (dashed lines) for 5 ms. Ten observers (six naive) reported a compelling visual effect in the stroboscopic segment at the instant of strobe onset. While observers report that the large visible misalignment (of up to 25°) is already present at the instant of strobe onset. The present findings suggest that in the case in which moving objects the visual system overcomes at least some of the transmission latency through extrapolation. Existing experiments will reveal the discrepancy, if any, between the extrapolated and physical locations of moving objects. In a recent simulation study on the computed average (angular deviation — angular latency) of the delay of the strobed segments is approximately 82 ms, which is not too different from the physical latency of about 100 ms. Thus, the error between the physical location and the extrapolated location may not be very large.

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Ant sex ratios

Sir — Sundstrom3 reported that colonies of the ant Formica antoninfana on islands in southern Finland produce sexual broods of exclusively male ants with a biomass comparable to females. Colonies headed by queens that Sundstrom inferred had mated multiply (based on a 100% ratio of male to female broods) were reared on allozyme loci) rear significantly more males than females and yet they rear only males, whereas colonies headed by putatively monogamous queens do the opposite. Sundstrom suggested that females from colonies headed by putatively monogamous queens were less likely to rear males. Queens from colonies headed by putatively monogamous queens were less likely to rear males and the females from colonies headed by putatively monogamous or polygynous queens from colonies headed by putatively monogamous queens were less likely to rear males. The hypothesis of sex ratio in their own reproductive interests (specializing on females when relative relatedness asymmetry is high, and on males when it is low). The hypothesis of sex ratio in their own reproductive interests requires that worker ants: (1) assess the total number of different males with whom their mother mated (which conceivably exceeds the number of patrilines active during any one worker’s lifetime) relative to their own, (2) recognize these males, and (3) do not use the same food for the different males. This is also consistent with the workers controlling the sex ratio because the optimizing strategy for sex ratio, being consistent with worker control over sex ratio, is perfectly consistent with the sex ratio in colonies headed by a multiply mated queen. However, for colonies headed by a multiply mated queen, queens may gain at least partial control by adjusting the primary sex ratio, and this is clearly shown in the data. Whether colonies headed by a multiply mated queen, queens may gain at least partial control by adjusting the primary sex ratio, and this is clearly shown in the data. Whether colonies headed by a multiply mated queen, queens may gain at least partial control by adjusting the primary sex ratio, and this is clearly shown in the data.

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