# AIDS caused by a slow virus

SIR—Recognition that AIDS (acquired immune deficiency syndrome) is caused by a lentivirus has been slow in coming[1]. Ellrodt and LeBras[2] do a signal service to those devising vaccines for human immune deficiency viruses (HIVs) by offering a cautionary warning about the unusual properties of these slow viral agents. Similar warnings should be issued to policy planners in their projections of future prevalence of AIDS. Based on other lentiviruses, the full impact of the HIVs may not become known until one-half to two-thirds of the life span of infected individuals has passed[3]. In the case of humans, manifestations of the disease could continue to appear in survivors for 20–40 years after infection. Coupled with the prospect of transgenic humans (T.M. Folks, personal communications) arising over this long disease course, the case for prevention of AIDS seems even more pressing.

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1. Connor, S. *New Scient.* 12 February (1987).
2. Ellrodt, A. & Le Bras, P. *Nature* **325**, 765 (1987).
3. Haase, A.T. *Nature* **322**, 130–136 (1986).

# Soviet AIDS

SIR—There has been official frankness about the presence of AIDS (acquired immune deficiency syndrome) in the Soviet Union for rather longer than Vera Rich gives credit for (*Nature* **326**, 3; 1987). When the agreement between Britain and the Soviet Union on cooperation in the field of medicine and public health was re-signed last November after an almost total lapse of seven years, a protocol was drawn up providing for cooperative research in selected fields, including public health and laboratory aspects of AIDS. Specifically covered were viral cultures and characterization of strains, including molecular structure, and studies of methods of detection of antibody, distribution of antibodies and means of epidemic control. There was no suggestion that this research was of a purely academic interest to the Soviet Union.

The castigation by a Soviet deputy minister of health of Western companies that keep secret their work on AIDS diagnostics may at first sight appear to be mere propaganda against the greedy, capitalist West. But to anyone raised on a diet of Communist teaching, some Western commercial practices must seem highly unethical. We have been schooled in the merits of free enterprise and can rationalize that to give a competitor a costless lead would mean less profit for, and ultimately less research by, the pioneering company. Yet even then, not all of us are immune to doubts as to the ethics of full commercial secrecy where potentially life-saving products are being researched and developed and when one of its results is colossal duplication of scientific effort.

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# Rabies experiment

SIR—We wish to correct a number of misconceptions and inaccuracies in connection with the rabies experiment by the Pan American Health Organization (PAHO) in Argentina, which was the subject of a letter from an independent group of Argentinian scientists (*Nature* **324**, 610; 1986).

Wistar's part in the experiment was solely as consultant for the development of the protocol, fund-raiser for the costs of the experiment and supplier of the vaccine to PAHO. But as you refer to the Wistar Institute in the title of the letter, we wish to clarify the actual conditions of the experiment.

The experiment was designed to evaluate a live recombinant virus vaccine for immunization of cattle against rabies. The vaccine, a vaccinia-rabies glycoprotein (V-RG) recombinant virus, had previously been tested in animal species in captivity, including mice, rabbits, foxes, skunks and raccoons. In each case, protective immunity upon challenge with rabies virus had been demonstrated.

Before the experiment in Argentina, the level of rabies virus-neutralizing antibodies in cattle inoculated with the V-RG vaccine by intradermal, subcutaneous and intramuscular routes had been shown to be compatible with protection of these animals against a lethal challenge dose of rabies virus (P. Desmettre, personal communication). As the Argentine scientists raise the question of "possible alteration in the tissue localization of the recombinant virus", it should be emphasized that in all previous experiments with other animal models in which the spread of V-RG recombinant virus within the body was monitored, there was no evidence of gross or histopathological lesions caused by virus infection in any tissues collected *post mortem* and no evidence of increased neurotropism was detected in laboratory animals inoculated with varying doses of V-RG recombinant virus by a variety of routes. This would indicate that any vaccinia virus-rabies glycoprotein pseudotype that might emerge does not enhance the already reduced neurovirulence of V-RG recombinant virus.

In the vaccine trial in Argentina, 40 cattle were divided into two groups. On 11 July 1986, ten animals in one group were vaccinated subcutaneously in the neck with 1 ml of the V-RG recombinant vaccine administered from a 'multiple dose' syringe, similar to ones used for routine vaccination of cattle. In the other group, ten animals were vaccinated with the recombinant vaccine by intradermal scarification in a previously shaved area on the neck of each animal. The ten cattle vaccinated subcutaneously and the ten cattle vaccinated by scarification were kept in separate enclosures but in close contact with ten non-vaccinated cows. The enclosures for each group of 20 animals (ten vaccinated and ten non-vaccinated) were separated by a distance of a quarter of a mile and consisted of a shed in a fenced field. During the first month of the trial, the animals were kept in the shed to ensure the closest possible contact between vaccinated and non-vaccinated cattle. Milking cattle were used in the experiment so that milk production levels could be monitored as a sensitive indicator of animal health. None of the vaccinated cattle showed any decrease in milk production throughout the trial period and none showed any sign of illness.

By order of the animal disease authority in Argentina, all 40 cattle were killed on 14 November 1986, and the blood samples obtained 3-4 months after vaccination have so far been barred from use in assays for antibodies against rabies and vaccinia viruses. The one-month post-vaccination samples had, however, already been tested, and the results indicated that the vaccinated cattle developed protective levels of anti-rabies antibody. None of the non-vaccinated animals developed anti-rabies antibodies, which suggests that the vaccinia-recombinant virus did not spread from vaccinated animals to non-vaccinated animals.

From a scientific point of view, it makes no sense for the animals to have been killed four months after immunization, when they were healthy and unlikely to have been shedding the virus, thus preventing the acquisition of further valuable information about the efficacy of the recombinant vaccine in cattle. In their letter to *Nature*, the Argentinian scientists stated: "We are not against the development of recombinant vaccine technology in view of its potential value for effective disease control". If this was said in all sincerity, what is their view of the elimination of 40 healthy animals by order of the authorities and the consequent failure to complete an important scientific experiment. Is that science or politics?

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