ly combat poaching, and improve a caviar-labeling system for all exports.

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Wildlife Service to list beluga as endangered. Such a ruling, now 2 months overdue, would ban all imports by the world’s biggest caviar importer. Alternatively, the service could list the fish as threatened and impose some restrictions on import—or not classify it at all.

Although most environmental groups hope that the fish is listed as endangered, some experts warn that a U.S. ban would deprive hatcheries of funds from the harvest now used for conservation and would increase poaching, as has happened with Indian tiger parts and African elephant ivory. Others insist that only vanishingly small amounts of revenue from caviar sales have been earmarked for conservation. With the beluga’s fate hanging in the balance, the spring harvest—when most sturgeon are caught—is already under way.

—FIONA PROFFITT

With reporting by Christopher Pala in Almaty, Kazakhstan, and Jeyling Chou in Cambridge, U.K.

### VIROLOGY

**HIV May Shed Some Protection as It Jumps to New Hosts**

Each person infected with HIV harbors a swarm of slightly different versions of the virus. But researchers have long known that when HIV passes from a mother to child or between sexual partners, only one of those strains is transmitted. Now, a new study, published on page 199, goes further: It reveals provocative details about the nature of the viruses that are transmitted.

The study relied on a cohort of more than 1000 “discordant” couples—meaning only one partner was infected—in Zambia. They received counseling on how to prevent transmitting the virus and were monitored at 3-month intervals for several years by a team led by epidemiologist Susan Allen of the University of Alabama, Birmingham (UAB). Virologists Eric Hunter (Allen’s spouse) and Cynthia Derdeyn of UAB and their collaborators did intensive molecular analyses of HIV transmitted heterosexually from four men and four women to their partners. Six of the eight transmitted viruses had distinctive surface proteins.

“It’s a very interesting paper both in terms of vaccine development and potentially for the microbicide field,” says Robin Shattock, a virologist at St. George’s Hospital Medical School in London who studies sexual transmission of HIV. “If we can get better at predicting the key characteristics that control transmission, it’s going to cause a big shift in what we’re doing.”

HIV establishes an infection by latching its surface protein, gp120, onto CD4 receptors that stud immune-cell surfaces. The UAB team found that gp120s on the most commonly transmitted virus, compared to those on the average virus found in “donors,” had been stripped of amino acids and, in particular, sites that bind sugars that normally cloak the surface protein. These scantily clad gp120s, the researchers surmise, find it easier to establish an infection because the lack of amino acids and sugars exposes the region of the surface protein that best binds to CD4.

But infectivity should come at a high cost: Exposing the CD4-binding site makes it vulnerable to antibody attack. And when antibodies attach to this site, they block HIV’s ability to initiate an infection, thus “neutralizing” the virus. To test whether the transmitted viruses are indeed more vulnerable, the researchers took antibodies from the donors and compared their power against the predominant viruses in the donor and also against the HIV species they transmitted. As expected, the transmitted HIVs proved up to 10 times more sensitive to neutralization. As Hunter puts it, “Some of the protective armor that the donor virus had to put on to protect itself against the antibody response has been taken off by viruses that have established infections.”

For vaccine and microbicide developers, this could present a potentially huge boon. “It might cut us a break if viruses that are transmitted are more sensitive to neutralizing antibodies than your average garden-variety viruses,” says Dennis Burton, who studies HIV antibodies at the Scripps Institute of Research in La Jolla, California. But he quickly adds a caveat shared by several leading AIDS researchers: “My gut feeling is that this will turn out not to be the case.” And Hunter himself says, “We want to be really careful to not give the impression that it’s going to make vaccine development super easy now.”

Indeed, virologist Douglas Richman of the University of California, San Diego, says he and colleague Susan Little already have contrary evidence from their own discordant-couples study that focuses predominantly on a group of homosexual men. The group sees no stripping down of gp120s. Cautions Richman, “We simply don’t even see a trend for any of the observations in this paper.”

Other researchers emphasize that the paper has a critical limitation, which the authors themselves note: They could not distinguish whether the HIV found in the recipient was the virus strain transmitted or one that evolved shortly after infection. John Moore, an HIV antibody researcher at Weill Medical College of Cornell University in New York City, notes that a newly infected person would not develop neutralizing antibodies against HIV for at least several weeks. “So the neutralization sensitivity they found in these viruses may be coincidental to their replicating in a nonneutralizing environment,” Moore says.

The Zambian discordant-couple study raises one indisputable point: Huge unknowns still exist about what happens to HIV as it moves from one sexual tract into another. “We’re working in the dark,” says Moore. So whatever these results ultimately mean, in the short term, they promise to draw eyes to a subject that many researchers who investigate ways to stop HIV transmission believe badly needs more attention.

—JON COHEN