Cure: Mutation Protection

A key mutation protected humans against simian HIV for millennia.

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Early humans adapted a genetic mutation that for perhaps hundreds of thousands of years likely protected them against the simian immunodeficiency virus (SIV) that plagued their primate cousins. But at some point in recent history, SIV evolved to outmatch this human mutation. Researchers analyzed an intertwined complex of three proteins—Nef (which SIV expresses), tetherin and AP-2—that develops in SIV-infected primates. Tetherin is supposed to prevent new viral copies from escaping from the surface of immune cells. But Nef and AP-2 draw tetherin into the tightly wound complex, which the cell then digests. Human tetherin mutated to evade capture by the complex. But then SIV acquired a new protein, Vpu, that in humans was able to capture tetherin where Nef had failed. This likely allowed SIV to cross into the human population at last. Such findings may aid HIV cure research.

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