

Critical thinking about the origin of AIDS

Comments on Stephen Jenkins' account

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Stephen H. Jenkins, in his book *Tools for Critical Thinking in Biology*, includes a section titled “Peer review and the origin of AIDS.”¹ In it, he analyses two main theories about the origin of AIDS, the cut-hunter and the polio-vaccine hypotheses. He also draws on and comments on my social science studies of the origin-of-AIDS dispute.

Critical thinking is worthwhile in nearly every field of scholarship. However, it comes with a series of traps for the unwary. My aim here is to point out some of the shortcomings of Jenkins' treatment, illustrating how better knowledge and broader understanding can help to overcome some of the traps.

Two origin-of-AIDS theories

The cut-hunter theory proposes that a hunter in Africa, in the course of butchering a chimpanzee, got some chimp blood in a cut. By this means, it is possible that a simian immunodeficiency virus (SIV) in the chimp's blood entered the hunter's bloodstream, becoming a human immunodeficiency virus (HIV). If transmissible to other humans, this is a potential source of the AIDS pandemic.²

The oral-polio-vaccine or OPV theory proposes that a polio vaccine developed by pioneer scientist Hilary Koprowski and given to nearly a million Africans from 1957–1960 was contaminated by the SIV precursor of HIV. At the time, polio

¹ Stephen H. Jenkins, *Tools for Critical Thinking in Biology* (New York: Oxford University Press, 2015), pp. 217–219.

² Related mechanisms proposed as possibilities for transmission of SIVs to humans include a human being bitten by a chimp and injection of chimp blood as part of human sexual rituals.

vaccines were grown on monkey kidneys; the theory is that chimpanzee kidneys were used as a medium to amplify some of the vaccines given in Africa.

Jenkins outlines these two theories, but without giving pertinent information about the plausibility of the OPV theory, which offers an explanation for both the location and timing of the earliest known HIV+ blood samples. Koprowski's vaccine was given to hundreds of thousands of people in precisely the area of Africa thought to be the starting location of the AIDS pandemic. The timing of the vaccination campaign also fits: there are no known HIV+ blood samples or cases of AIDS prior to Koprowski's vaccination campaign.

Another point is worth noting: there is a precedent for transmission of a simian virus to humans. Albert Sabin's oral polio vaccine, given to hundreds of millions of people worldwide, was discovered to be contaminated by a simian virus called SV40.³

Jenkins gives a brief account of the early proponents of the OPV theory, though with some omissions and mistakes.⁴ He refers to the ground-breaking work by Edward Hooper, citing Hooper's 1999 book *The River*. However, he does not bring the story up to date, not citing Hooper's major paper (of book length) published a few years later.⁵ Nor does Jenkins cite Hooper's AIDS origins website, which contains numerous recent documents, including replies to criticisms.⁶

³ On the possible health consequences of this contamination, see Debbie Bookchin and Jim Schumacher, *The Virus and the Vaccine* (New York: St. Martin's Press, 2004).

⁴ Jenkins correctly credits Louis Pascal with early formulation of the OPV theory, but omits a contemporaneous and independent — though less well developed — argument by South African biologists Gerasimos Lecatsas and Jennifer Alexander. Jenkins refers to the independent publication of the OPV theory by journalist Tom Curtis, but omits that Curtis drew his inspiration from the Blaine Elswood who, independently of Pascal, developed a similar explanation; Curtis investigated further and elaborated the theory.

⁵ Edward Hooper, "Dephlogistication, imperial display, apes, angels, and the return of Monsieur Émile Zola: new developments in the origins of AIDS controversy, including some observations about ways in which the scientific establishment may seek to limit open debate and flow of information on 'difficult' issues," *Atti dei Convegni Lincei*, Vol. 187, 2003, pp. 27–230.

⁶ <http://www.aidsorigins.com/>

Jenkins on Martin

Jenkins refers to my own writings on the origin of AIDS.⁷ However, he misrepresents my views in two important ways. Jenkins says, “Brian Martin has published a series of papers claiming that biologists and physicians have conspired to discredit the tainted polio vaccine hypothesis.” Certainly I argue that many mainstream scientists oppose the OPV theory and have taken actions to discredit it. To describe this as me saying “biologists and physicians have conspired” — without giving a definition or description of “conspired” — denigrates my work by associating it with popular conceptions of conspiracy theories, which are often assumed to be wrong even without a specific refutation.

Jenkins says that I have “promoted” the OPV theory despite it being disproven. Actually, I have never argued in favour of the OPV theory. All my writing has been based around arguing that it was and remains worthy of consideration yet in many ways has been unfairly dismissed.⁸

Refutation?

Jenkins has joined the chorus saying the OPV theory has been refuted. He does this by citing a 2008 paper by Michael Worobey et al. that dates the transmission of SIV into humans to around 1908, decades before Koprowski’s polio vaccine campaign in the 1950s. This would indeed seem, on the surface, to be a refutation of the OPV theory.

Let me first note that in science, refutations are never final. It is always possible for new evidence and arguments to resurrect an apparently defunct theory (or

⁷ He cites two papers: Brian Martin, “Peer review and the origin of AIDS—a case study in rejected ideas,” *BioScience*, Vol. 43, No. 9, 1993, pp. 624–627; Brian Martin, “How to attack a scientific theory and get away with it (usually): the attempt to destroy an origin-of-AIDS hypothesis,” *Science as Culture*, Vol. 19, No. 2, June 2010, pp. 215–239. My other publications on the topic are available at <http://www.bmartin.cc/pubs/controversy.html#AIDS>.

⁸ In “Peer review and the origin of AIDS,” I wrote, “The aim of presenting this story is not to argue that this particular theory is correct.” (p. 624). In “How to attack a scientific theory,” on pp. 223–224 I wrote “I use ‘OPV-theory proponents’ and ‘OPV-theory supporters’ as shorthand to include both advocates of the OPV theory and those—like Tom Curtis, W. D. Hamilton and myself—who believe it has not received a fair hearing.” In retrospect, I was unwise to combine under one term those who believe the theory is probably correct and those (like myself) who believe it has been unfairly dismissed, not anticipating that a reader such as Jenkins would not make the same distinction.

to undermine a seemingly solid one). Research findings never conclusively demonstrate or undermine a theory. In this context, Jenkins' claim that the OPV theory has been refuted is contestable.

Several times before, the OPV theory has been pronounced dead. In one case, a sailor, David Carr, who died in Manchester in 1959, was subsequently diagnosed with having AIDS. The Carr case was used as the nail in the coffin of the OPV theory by a committee set up by the Wistar Institute, the manufacturer of Koprowski's vaccine.⁹ However, later testing showed no HIV in Carr's tissues.¹⁰ The conclusive refutation turned out to be faulty.

Another alleged refutation, presented dramatically at the origin-of-AIDS conference held at the Royal Society of London in 2000, was that testing of polio vaccine samples held by the Wistar Institute showed no signs of chimp cells or HIV. This was touted as the end of the OPV theory. But it never could have been, because testing some vaccine samples does not exclude the possibility that other vaccine samples had been contaminated but not saved in the Wistar Institute's freezers. Because pools of vaccine can be prepared in different laboratories at different times, such testing cannot prove that a pool is free of contamination, only that a specific vaccine batch is.

There was a more important reason why the Wistar sample testing was not fatal to the OPV theory. At the Royal Society meeting, Hooper presented new evidence that polio vaccines, provided by the Wistar Institute and flown to Africa, had been amplified in chimp tissues. In this scenario, the contamination occurred in Africa, not in Philadelphia.^{11 12}

⁹ Claudio Basilio, Clayton Buck, Ronald Desrosiers, David Ho, Frank Lilly and Eckard Wimmer, "Report from the AIDS/Poliovirus Advisory Committee," 18 September 1992.

¹⁰ Tuofu Zhu and David D. Ho, "Was HIV Present in 1959?" *Nature*, Vol. 374, 6 April 1995, pp. 503–504.

¹¹ Edward Hooper, "Experimental oral polio vaccines and acquired immune deficiency syndrome," *Philosophical Transactions of the Royal Society of London B*, Vol. 356, 2001, pp. 803–814.

¹² Jenkins says that, "When research later showed that HIV-1 was derived from SIV specific to chimps, not monkeys, the hypothesis was modified to suggest that Koprowski's team in the Congo had a chimpanzee colony as well as monkeys and used some material from chimps when they made polio vaccine." No one has denied that Koprowski had a chimp colony in the Congo, so it is misleading to say the theory

Jenkins does not mention these or other claimed refutations that turned out not to be definitive. Nor does he make the crucial point that new evidence and arguments can change the evaluation of a theory. Instead, he asserts that the 2008 study of Worobey et al. is conclusive in refuting the OPV theory, but does not look closely enough at the arguments to the contrary.

Worobey et al.¹³ analyse the genetic structure of HIV specimens taken from early blood samples, the earliest in 1959 and 1960. They make assumptions about the rate of change of gene sequences due to mutations and use a mathematical model to work backwards to conclude that HIV probably began in humans between 1884 and 1924. Their gene sequencing is empirical but their calculation of the date of the origin of AIDS is theoretical, in the sense that it relies on a mathematical model whose premises can be questioned. If Worobey et al. had produced several independent samples of HIV+ blood collected prior to the 1950s, they would have provided empirical evidence to rebut the OPV theory. But they didn't.

Jenkins says Worobey et al.'s study provides "empirical data for rejecting the tainted polio vaccine hypothesis, not simply a theoretical argument." Yes, the study draws on empirical data, but Jenkins' dichotomy between "empirical data" and "simply a theoretical argument" is misleading. Worobey et al. use both empirical data and a mathematical model. It is the model that makes their conclusion theoretical — it relies on contestable assumptions about the mechanism and rate of HIV genetic variation.

The OPV theory operates on a different set of assumptions than Worobey et al.'s study. If some of the polio vaccines given to nearly a million people were contaminated with SIVs, this might result in HIVs with distinct genetic structures.¹⁴

was modified to suggest this. Jenkins' sentence conflates two things: new documentary evidence about amplifying polio vaccines in chimp kidneys in Africa and a modification of the theory to take this evidence into account.

¹³ Jenkins does not include this paper in his list of references. Undoubtedly it is Michael Worobey, Marlea Gemmel, Dirk E. Teuwen, Tamara Haselkorn, Kevin Kunstman, Michael Bunce, Jean-Jacques Muyembe, Jean-Marie M. Kabongo, Raphaël M. Kalengayi, Eric Van Marck, M. Thomas P. Gilbert and Steven M. Wolinsky, "Direct evidence of extensive diversity of HIV-1 in Kinshasa by 1960," *Nature*, Vol. 455, 2 October 2008, pp. 661–664.

¹⁴ This possibility has been raised by several authors, including Tom Burr, J. M. Hyman and Gerald Myers, "The origin of acquired immune deficiency syndrome: Darwinian or Lamarckian?" *Philosophical Transactions of the Royal Society of*

Furthermore, genetic recombination can accelerate genetic differentiation between HIVs faster than mutations, as argued by several researchers.¹⁵

Thus there are two reasons why Worobey et al.'s study is not a refutation of the OPV theory: the mathematical modelling in the study is based on contestable premises, and there is an alternative explanation for the genetic diversity in HIV samples.

Referring to my paper "How to attack a scientific theory," Jenkins writes, "a critic must rebut the specific evidence and logic presented by the other side." This statement misconceives my work in two ways. Contrary to Jenkins' claim, it is not my task to rebut the evidence and arguments backing the cut-hunter theory. My role has always been to analyse the scientific community's response to the OPV theory, as a way of offering insights into the dynamics of science. Secondly, I have already explained my reference to Worobey et al.'s argument being theoretical. Jenkins refers to "empirical" and "theoretical" in a different way than me, but rather than exploring our perspectives (and Hooper's) on Worobey et al.'s research, he simply dismisses my view. Furthermore, he does not mention that I cited Hooper's reply to Worobey et al.¹⁶

London B, Vol. 356, 2001, pp. 877–887; David M. Hillis, "Origins of HIV," *Science*, Vol. 288, 9 June 2000, pp. 1757–1759: "A third possibility is that multiple strains of SIV were transmitted from chimpanzees to humans at about the same time in the 1940s or 1950s." (p. 1757); B. Korber, M. Muldoon, J. Theiler, F. Gao, R. Gupta, A. Lapedes, B. H. Hahn, S. Wolinsky and T. Bhattacharya, "Timing the ancestor of the HIV-1 pandemic strains," *Science*, Vol. 288, 9 June 2000, pp. 1789–1796: "Thus, for the OPV hypothesis to be consistent with our analyses, at least nine genetically distinct viruses would have had to enter the human population through the vaccine." (p. 1795).

¹⁵ Vladimir V. Lukashov and Jaap Goudsmit, "Recent evolutionary history of human immunodeficiency virus type 1 subtype B: reconstruction of epidemic onset based on sequence distances to the common ancestor," *Journal of Molecular Evolution*, Vol. 54, 2002, pp. 680–691; Mikkel H. Schierup and Roald Forsberg, "Recombination and phylogenetic analysis of HIV-1," *Atti dei Convegni Lincei*, Vol. 187, 2003, pp. 231–245.

¹⁶ Edward Hooper, "HIV-1 in 1908? Another sad comedy of errors from Michael Worobey," 9 October 2008, now found at <http://www.aidsorigins.com/hiv-1-1908-another-sad-comedy-errors-michael-worobey>. This comment makes the points about mathematical modelling and recombination.

How to attack a scientific theory

Jenkins dismissed my article “How to attack a scientific theory” by saying Worobey’s study refutes the OPV theory, even though the validity of the theory is not the crux of my paper, as noted above. More curiously, Jenkins does not refer to the main arguments in my paper.¹⁷ In brief, I give considerable evidence of the use of five methods — cover-up, devaluation, reinterpretation, official channels and intimidation — that inhibit concern about violations of expected behaviour in science and that are used against the OPV theory. If Jenkins had taken this argument seriously, he would have had to address evidence that the OPV theory had been unfairly dismissed. Closer to home, he would have had to address the possibility that he has used some of the very techniques I described as being used against the OPV theory.

In relation to the method of cover-up, Jenkins has not tried to censor publications or films about the OPV theory. However, by failing to describe evidence and arguments in favour of the theory, and failing to provide up-to-date sources concerning the theory, he might be considered to be involved in a type of cover-up: a reluctance to include supportive information about the OPV theory in his account.

In relation to the technique of devaluation, Jenkins subtly denigrates the OPV theory in his way of referring to the publication venue of Louis Pascal’s paper, a University of Wollongong working paper series, saying, “It would be difficult to find a more obscure outlet.” This seems to suggest that the status of a publication outlet should be a factor in judging the validity of the argument, contrary to the view that ideas should be judged on their merit. As noted above, Jenkins denigrates my work by reference to “conspiring.”

Jenkins refers to the OPV theory as the “tainted polio vaccine hypothesis,” which is not the usual terminology. This can be read two ways, as referring to polio vaccines that are tainted, namely contaminated, or as suggesting that the hypothesis is tainted, and thereby serves as a subtle (and unintended) technique of devaluation. Jenkins nowhere mentions the most common term, namely the OPV theory.

In relation to the technique of reinterpretation, I wrote,

¹⁷ Jenkins writes that, “This sentence near the beginning of Martin’s paper caused me to be highly skeptical of the remaining 20 pages.” Does basing one’s view of an entire paper on an evaluation of one sentence represent critical thinking? Does discounting the possibility that the evaluation of the sentence might be wrong represent critical thinking?

The most effective explanatory tactic used by opponents of the OPV theory has been to assume the bushmeat theory is the default option, to be accepted if competing theories have any flaws. The onus of proof has been put on the OPV theory to pass strenuous tests whereas the bushmeat theory has been given little critical scrutiny.¹⁸

Jenkins uses this explanatory tactic. After describing several instances in which challenges to the OPV theory were incorrectly treated as definitive, I wrote that opponents of the OPV theory “have treated several challenges to the OPV theory—contrary evidence and theoretical findings—as definitive refutations, assuming OPV-theory proponents have no capacity for developing alternative explanations or finding new evidence.”¹⁹ As noted above, Jenkins also does this.

In summary, Jenkins uses three of the methods — cover-up, devaluation and reinterpretation — that I argued have been used in the course of censoring and discrediting the OPV theory. However, he failed to even mention the arguments in my paper “How to attack a scientific theory” and their possible relevance to his own critical analysis.

Lessons

From this brief introductory assessment of Jenkins’ treatment of the OPV and cut-hunter theories, I draw a few lessons for those who would like to apply their critical faculties to the origin of AIDS, and perhaps beyond.

- Present a balanced treatment of the evidence for competing theories.
- Never assume a claimed refutation of a theory is conclusive.
- Understand the field of the work of those being criticised. In particular, when analysing social science studies, seek to understand the approaches used by social scientists.
- Recognise that disputes about scientific knowledge inevitably involve matters of prestige, power and vested interests, and that ignoring these means missing crucial aspects of the dynamics of scientific knowledge.

¹⁸ “How to attack a scientific theory,” p. 227.

¹⁹ *Ibid.*, p. 229.