



The Left Atrium

Road to nowhere

Shots in the dark: the wayward search for an AIDS vaccine

Jon Cohen

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A colleague, dismayed at the chaos in AIDS research and treatment, once remarked that the virus has no ego — and it is winning the war. In his view, part of the problem was that no one with sufficient moral and scientific authority had emerged to lead the international battle against HIV.

In *Shots in the Dark* Jon Cohen, a noted journalist with *Science* magazine, meticulously chronicles the disappointing and depressing history of AIDS vaccine development. Although he acknowledges the complexity of HIV itself and the biological impediments to developing an AIDS vaccine, Cohen attributes the failure to develop an effective vaccine to human characteristics: pride, self-righteousness and avarice.

Cohen's book is the culmination of a 10-year investigation into "how the AIDS vaccine field suffered from disorganization, fractiousness, sleazy politics, sloppy science, a shaky marketplace, greed, unbridled ambition and leaders with shockingly limited powers." Not even the revered Jonas Salk, who entered the AIDS vaccine quest in 1986, nor Jonathan Mann, the human rights crusader and former head of the World Health Organization's Global Programme on AIDS, could successfully bring their stature to bear on AIDS vaccine research, "a road that was not heading anywhere in particular."

In the second of 15 chapters, Cohen outlines eight requirements for the "road to success," including the identification of an AIDS vaccine hero in the mould of polio's Jonas Salk. In the rest of the book he recounts in a blow-by-blow fashion the failure of government, scientific leaders, industry and activists to meet the standards necessary for

AIDS vaccine development.

At the heart of what Cohen terms a "standstill" in AIDS vaccine research is an ongoing struggle between the reductionists, whose focus is on basic science and on determining the mechanisms of HIV disease (the practical implications of their research being secondary) and the empiricists, who hold that testing promising vaccines in animals and humans is justifiable even without a full understanding of how they work. Reductionists generally support the use of limited financial resources to answer basic science questions, which they believe will ultimately accelerate the search for a successful vaccine. Empiricists argue that AIDS has been so devastating, particularly in developing nations, that vaccine testing cannot wait for bench scientists to complete their work. Cohen cites the development of the Salk vaccine and even Edward Jenner's cowpox experiment as examples of the benefits of empiricism. The tension, and sometimes outright hostility, between reductionists and empiricists has paralysed decision-making and contributed to a lack of collaboration and the failure to establish a single authoritative leadership. (Cohen describes an international vaccine meeting in 1998 at which delegates refused to vote on the central scientific issue of the meeting and then "refused to vote on whether they should vote on it.")

But, according to Cohen, the reductionist-empiricist conflict is only one of many that have slowed vaccine research to a crawl. Since the beginning of the epidemic, virologists have clashed with immunologists over treatment ap-

proaches, the former tackling HIV itself and the latter being more concerned with immune system responses. Early vaccine researchers focused almost exclusively on HIV-neutralizing antibodies while disregarding the crucial role of cell-mediated immunity. (Cohen argues that questions over the role of each will not matter if a successful vaccine is developed.) Battles have raged in United States government offices and in granting agencies over which type of research is deserving of funding: targeted and directed applied research, or investigator initiated and driven basic science research.

Cohen does not let AIDS activists ("as anachronistic as hippies") off the hook. He chides activists for their tardiness in bringing advocacy to the AIDS vaccine domain. The epidemic-old competition for resources between treatment and prevention found its way into the vaccine field: more money spent on vaccine development would mean less money for antiretroviral treatment development. Further, a successful vaccine might effectively end the search for a cure, leaving those who are already infected stranded with only the therapies that are currently available.

Cohen also has little patience for the pharmaceutical industry, which, motivated by profit and wary of liability risks, shrank away from vaccine development. In 1994 Salk, who was disengaging himself from AIDS vaccine research, declared that the industry had "come up with the value of a human."

Cohen's solution is to establish a single \$1 billion research organization called the March of Dollars (akin to polio's March of Dimes) to support clinical trials and pursue "alluring leads" neglected by researchers. He proposes that the March of Dollars be led by a person of the same stature and with political connections equivalent to those of the March of Dime's Basil O'Connor, President F.D.



Fred Sebastian

Roosevelt's former law partner.

Supported with 49 pages of notes, Cohen's account is credible and exhaustive. His grasp of HIV pathophysiology and immunology is greater than that of most physicians. And he has an intimate knowledge and understanding of the systemic and scientific obstacles that have hindered the development of an AIDS vaccine. This treatise will serve as a new and definitive baseline against which to measure progress toward the development of a safe and effective vaccine. It will also serve as a document of accountability for all involved in the vaccine effort. Failure is not acceptable.

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