Vaccines: A Biography
To my parents, Malcolm (1930–1976) and Sylvia (1933–2007), who inspired me in countless ways. They made the story personal.
Why another book about vaccines? There are already a few extremely well-written medical textbooks that provide comprehensive, state-of-the-art technical reviews regarding vaccine science. Additionally, in the past decade alone, a number of engrossing, provocative books have been published on various related issues ranging from vaccines against specific diseases to vaccine safety and policy. Yet there remains a significant gap in the literature – the history of vaccines.

_Vaccines: A Biography_ seeks to fill a void in the extant literature by focusing on the history of vaccines and in so doing, recounts the social, cultural, and scientific history of vaccines; it places them within their natural, historical context. The book traces the lineage – the “biography” – of individual vaccines, originating with deeply rooted medical problems and evolving to an eventual conclusion. Nonetheless, these are not “biographies” in the traditional sense; they do not trace an individual’s growth and development. Instead, they follow an idea as it is conceived and developed, through the contributions of many. These are epic stories of discovery, of risk-takers, of individuals advancing medical science, in the words of the famous physical scientist Isaac Newton, “by standing on the shoulders of giants.” One grant reviewer described the book’s concept as “triumphalist”; although meant as an indictment, this is only partially inaccurate. What in medicine could be more triumphant than conquering disease?

A prominent theme woven throughout the book is the interdependence of incremental scientific advances and investigators on one another and how these ultimately led to practical, preventive solutions to major public health problems in society. The book is nearly chronological in its approach to this history. Each chapter is written to stand independently, yet those who read it from cover to cover will discover that despite its broad scope, it is the “smallness” of the world of vaccine science and the inter-relatedness of its themes and characters that fascinates. The book is organized such that anchoring chapters are interspersed throughout; their purpose is to essentially introduce eras, reflecting the way in which I have chosen to present this biographical history. Smallpox represents a disease-specific chapter and an anchor chapter as well, because it served as the sentinel moment – the starting point – from which all vaccine science is measured. From there, vaccines developed in clusters proximate to major scientific developments. The evolution of microbiology and immunology as distinct sciences in the nineteenth century paved
the way for the first productive period of vaccines in a manner analogous to what
the discovery of viruses and subsequently tissue culture methods meant for the
fruitful vaccine period of the latter half of the twentieth century. The book ends
with its final anchor chapter, one meant to provide a foundation for what may be
the next surge in vaccine science related to molecular and genomic medicine.

Why another book about vaccines now? There are, to be fair, two forces that
have acted in synergistic fashion and driven me to write this book at this time. First,
it is a subject about which I am passionate; it is, literally and figuratively, in my
blood. I find the histories inspirational yet humbling, fascinating yet at times tragic.
They have all the trappings of fiction: strong protagonists who succeed against
sometimes great odds, interpersonal conflicts, deceit, political intrigue, ethical
dilemmas, and dramatic, if not staged, events. They are set in the major centers of
Europe and the United States, on farms and in slums, and in exotic venues from
Calcutta to French Indochina to Cairo to Panama. They occur in the halls of aca-
demia, the chambers of government, and on the battlefields of war.

The other, compelling motive to pursue this project at this juncture is that many
of the vaccine biographies detailed in this book describe events that occurred in the
recent past; many of those intimately involved in these histories are still with us,
some are still actively contributing to the field of vaccinology; many have contrib-
uted chapters to this work. Of course, many of the pioneers are gone, although in
some cases quite recently. I see Vaccines: A Biography as an appropriate way in
which to honor each of them and pay tribute to their efforts to improve the lot of
humankind.

As with any such project of this scope and magnitude, success depends on the
help of a dedicated staff and colleagues who are committed to excellence. The indi-
vidual chapter authors have produced truly outstanding biographical histories –
many of these individuals devoted much of their professional lives to their subjects
and were major contributors to the vaccines of which they write, circumstances that
are transparent upon reading their work. I am indebted to them for endeavoring to
produce an accurate, thoroughly readable, historical record of these stories. Margo
Katz coordinated the project, and Kathy Bollesen provided reliable and constant
administrative assistance; both once again showed their mettle through their devo-
tion to its successful completion. I am fortunate to work with such excellent people.
Dr. David Greer, Dean Emeritus of Brown Medical School and a close personal
friend, colleague, and mentor, carefully reviewed the manuscript and provided
valuable insights that improved the work. I am grateful for his guiding presence.
My wife Debbie, the love of my life, and my sons, Nick and Sam, provided a con-
stant source of support and listened as these stories came to life. I hope that those
who read this work learn as much and enjoy it as much as I did in writing and
editing it.

Providence RI

Andrew W. Artenstein
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