Chemically Programmable Immunity: The Challenge and Approach of Today's Disease/Pathogen Drug Treatments. KARY B. MULLIS. Founder, Altermune, LLC., Newport Beach, California and 1993 Nobel Laureate in Chemistry “For the Invention of Polymerase Chair Reaction (PCR).”

The invention of the polymerase chain reaction (PCR) was hailed as one of the monumental scientific techniques of the twentieth century. The PCR method of amplifying a single DNA strand into billions of copies of genetic material within hours revolutionized the science of medicine, genetics, biotechnology and forensics. A challenge for today is the development of technology to address the growing threat of infectious diseases due to the burgeoning and increasingly mobile human population. This has become recently more acute as a result of worldwide political unrest and the possibility of bioterrorism. The Altermune method involves the development of a chemical means for redirecting the immune system. The essence of this approach is the use of synthetic, pharmaceutical linker molecules tailored in one part of their structure to bind to a pre-existent immune response, and in another part of their structure to a target pathogen. This methodology resembles a drug rather than a vaccination, although its effects are, temporarily, the effects of the latter. Preliminary experiments have focused on developing linker molecules that will bind to both a specific pathogen, and either the alpha-Gal immune structures, or alternatively to the immune structures of an intentionally induced immune response. The alpha-Gal immune response is present in all humans and produces antibodies to the alpha-Gal epitope. An example of this immune response is our response to the tissue contained in a pig heart valve. The pig heart valve contains millions of alpha-Gal epitopes and is quickly destroyed on xeno-transplantation into humans unless drastic immuno-suppression is employed. The ultimate goal of the Altermune technology is the development of linkers that can direct an appropriate arm of the immune system against any particular pathogen.