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Why don't our vaccines reach the high-hanging fruit?

Immunologists have learned a tremendous amount from vaccinologists but learnings in the opposite direction have been rather poor. Despite the development of a multitude of new vaccine technologies, current vaccine approaches are still empirical and very much focused on inducing measurable immune responses that mimic those induced upon natural infection and which correlate with natural protection. Hence, modern contemporary vaccines are primarily using recombinant or synthetic antigens that bind to the MHC peptide-binding groove (so-called 'conventional' antigens) to induce 'foreign-centered' immune responses (i.e., antibodies and T cells). 'Modern' vaccinology rarely takes into consideration the ground-breaking knowledge and insights gained since many years by immunologists and molecular epidemiologists on how pathogens have evolved immune subversive mechanisms to adapt to their natural host such as to ensure their replication and propagation. As a result of this dogma-driven ignorance, the vaccine field continues to struggle with very little progress made in the fight against infections and immune-mediated or immune-tolerated diseases other than the notorious 'low-hanging fruit'. It is, therefore, high time for vaccine makers to shift gears and translate some critical epidemiological and immunological knowledge on host-pathogen interactions and the immune pathogenesis of infectious or immune-mediated diseases into truly rational vaccine approaches. There is an increasing consensus that in order for vaccinologists to succeed in driving a safe immune defense strategy that is no longer frustrated by natural infection or naturally occurring immune-mediated disease, vaccines should elicit immune responses that are fundamentally different from those induced upon natural infection or other immune subversive diseases. Hence, it will be paramount for vaccinologists to become better informed and more knowledgeable about the molecular mechanisms underlying immune evasion mechanisms of pathogens in order to design vaccines that are more likely to prevent pathogenic agents from escaping vaccine-mediated immune responses.

Biography

Vanden Bossche received his DVM from the University of Ghent, Belgium, and his PhD degree in Virology from the University of Hohenheim, Germany. He held adjunct faculty appointments at universities in Belgium and Germany. After his career in Academia, Geert joined several vaccine companies (GSK Biologicals, Novartis Vaccines, Solvay Biologicals) to serve various roles in vaccine R&D as well as in late vaccine development. Geert then moved on to join the Bill & Melinda Gates Foundation's GH Discovery team as SPO and later on to work with GAVI as Senior Ebola Program Manager; he subsequently joined the German Center for Infection Research as Head of the Vaccine Development Office. Geert is now primarily serving as a Biotech/ Vaccine consultant while also conducting his own research on NK cell-based vaccines. His work is driven by a relentless passion to translate scientific breakthrough findings into competitive vaccine products. As a creative thinker, innovator, entrepreneur and visionary, Geert has been invited to speak at multiple international congresses.

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