

GSK

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Seeking partners to help accelerate vaccine R&D

GSK has part of the solution to some of the world's biggest health challenges. Do you have another part?

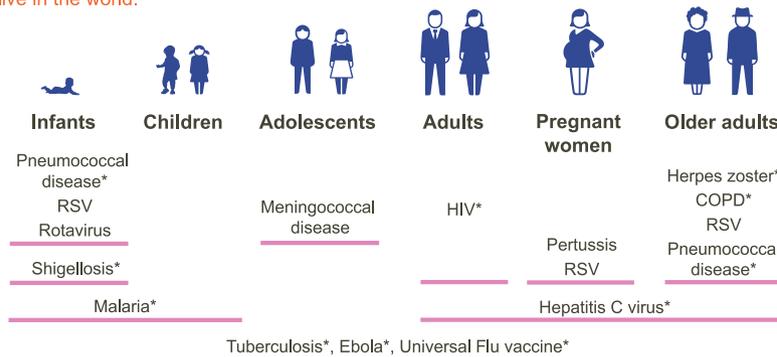
GSK's science-led approach to the discovery and development of vaccines is coupled with the recognition that research and development (R&D) is strengthened by collaboration with external partners. In 2017, GSK Vaccines engaged in more than 180 scientific collaborations while investing £621 million in R&D.

As one of the leading vaccine developers, GSK is keen to facilitate the exchange of intellectual know-how between the 2,000 scientists at its R&D sites in Rixensart (Belgium), Rockville (Maryland, USA), and Siena (Italy) and academic groups—including graduate and postdoctoral research programs—biotechs, consortia, charities, and pharmaceutical companies.

The company forms strategic relationships and collaborations from early-stage research to late-phase development, and deploys whichever collaborative model is most likely to deliver the right results. GSK seeks to understand how the perspectives, needs, and priorities of its collaborators can further vaccine R&D, and is instilling this spirit in the next generation of vaccinologists through the courses and opportunities it provides for PhD and postdoctoral scholars. GSK is looking for more collaborations in the areas shown in **Box 1**.

This inclusive approach, which covers private–public groups engaged in research at all stages of the vaccine development cycle, keeps GSK closely in touch with emerging technologies. The company looks for opportunities to apply these technologies across its R&D activities. For example, GSK uses its current platforms, such as self-amplifying mRNA (SAM) technology, adjuvant systems, and structural vaccinology, to support the development of a range of new vaccines to address major public health challenges.

GSK's vaccine development pipeline. GSK is working towards broad solutions aimed at protecting individuals against infectious diseases throughout their life-course, wherever they live in the world.



COVID, chronic obstructive pulmonary disease; HIV, human immunodeficiency virus; RSV, respiratory syncytial virus.
*In-licensure or other alliance relationship with third party.

GSK also takes an inclusive approach to protecting people from disease by pursuing the innovation needed to develop vaccines covering their entire life course. The company is working across exciting fields, from maternal immunization and support for healthy aging, to anticipation of infectious disease outbreaks and approaches to counter antimicrobial resistance.

Collaboration in action

Through its participation in the REspiratory Syncytial Virus Consortium in Europe (RESCEU), an Innovative Medicines Initiative project, GSK has joined with more than 50 teams from academia, patient groups, pharma, regulatory agencies, and other fields to

integrate the teams' knowledge about the respiratory syncytial virus (RSV).

The breadth of the collaboration and the scale of its ambition—to develop a vaccine against a virus that causes severe disease in the very young, older adults, and in high-risk groups—are in-line with GSK's approach to vaccines. In 2005, RSV was associated with 66,000–199,000 deaths worldwide in children under 5 years old¹.

GSK's spirit of collaboration is also demonstrated through the development of the malaria vaccine. Fighting such a disease is scientifically very complex because the parasite has the ability to elude the control mechanisms of our immune system. GSK worked with a number of partners, such as the Walter Reed Army Institute of Research, the PATH Malaria Vaccine Initiative, the Bill and Melinda Gates Foundation, and African scientists, as the candidate vaccine moved into clinical testing. The public–private partnership shared expertise, costs, and risks, and after 30 years their joint efforts finally led to a positive opinion granted by the European Medicines Agency and the upcoming pilot implementation in Ghana, Kenya, and Malawi led by the World Health Organization.

GSK's broad roster of R&D collaborations is testimony to its willingness to be flexible to achieve the best outcome, and its belief that breakthroughs are enabled when groups combine their different parts of the solution to health challenges.

1. Nair, H. et al. *Lancet* 375, 1545–1555 (2010).

Box 1: Areas of interest for potential partnerships with GSK Vaccines research and development

Fundamental and applied immunology

- Understanding host–pathogen interactions and immune responses to infectious diseases and vaccines
- Novel applications of systems biology and data analysis, including artificial intelligence
- Developing new protective antigens
- New immunization strategies and technologies

New vaccine targets

- Discovering targets for infectious diseases (bacterial and viral diseases and diseases prevalent in the developing world) and noninfectious diseases

Adjuvants and other technology platforms

- Developing new approaches to modulate the immune system and understanding the mechanism of action of adjuvants

Antigen design and delivery

- Developing nanoparticles and virus-like particles and investigating antigen stability

- Working with vectors, RNA, and new antigen-presentation platforms
- Structural vaccinology

Vaccine delivery

- Developing mucosal, oral, sublingual, nasal, and intradermal delivery methods and devices
- Thermostability

New assessment technologies and analytical tools

- Miniaturizing clinical assays and making them faster and more robust, and developing quality control and assurance assays
- Biomarkers and the application of systems biology to (new) readouts

New production process technologies

- Process monitoring, process efficiency, and simpler and faster antigen production
- Alternative expression systems

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