



A Call to Action: Driving Innovation toward the Development of A Universal Influenza Vaccine

The Meeting Brief

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With the backdrop of the centenary mark of the epic toll of the 1918 influenza pandemic, governments, philanthropists, industry, and the media again sounded the alarm of the unique and ever-present threat posed by this menacing disease. And while promising additional research initiatives and investments emerged in response, much of its focus remained on incremental approaches engaging the traditional stakeholders of the influenza community.

Influenza simultaneously costs hundreds of thousands of lives and millions of dollars in lost productivity every year and threatens catastrophic pandemic potential that has demonstrated historical disruption to global economic and social stability and the loss of millions of lives seen from few other natural or man-made causes. Despite this, a broadly cross-protective universal influenza vaccine (UIV)—the surest way to protect the world—remains as cited in Jonathan Cohen’s recent *Science* article, ‘an alchemist’s dream’. How is it—given all that we know of the clear and present dangers of influenza—that we have yet to focus and harness the full power of the scientific and technological enterprise toward this goal? The current assets—human, technical, and financial—seeking to upend this grave threat remain woefully inadequate compared to the scale and urgency of this global challenge.

Beginning in 2018 and with support from Flu Lab, the Sabin Vaccine Institute set out to examine the current influenza vaccine ecosystem and to consider how to create opportunities for novel and innovative research to contribute to an acceleration of the pursuit of a universal influenza vaccine. Through an extensive landscaping involving experts from across the research, industry, funding, and policy spectrum, a number of challenges were identified that consistently pointed to deterrents to broadening innovative approaches to UIV development:

- *“research siloes neither invite nor incentivize participation from non-traditional players...space does not exist for collaboration, cross-pollination, and serendipity”*
- *“traditional research culture does not encourage risk-taking or ‘big bets’ given competition and pressure to publish”*
- *“influenza vaccine research has been a closed ecosystem dominated by a small number of traditional players”*
- *“private capital and philanthropic donor investment is nascent in UIV, and there are missed opportunities to engage funders who are interested in innovation and transformative change”*

It is at the intersection of these challenges and the continually emerging promise of opportunities across the scientific and technological enterprise—that can and should be brought to bear on universal influenza vaccine discovery and development—that we will begin our discussions for the meeting.

In considering the transformative impact of a universal influenza vaccine and the work thus far to enlist novel approaches to this goal, we will then probe more directly how to create a set of tools and approaches that better enable entry of new and diverse thinkers to work toward the development of a UIV. We will consider how a ‘convergence’ of the diverse skills, knowledge, methods, and technological capacity for problem-solving from researchers and practitioners in the broad areas of the life, physical, and computational sciences can be promoted and more systematically organized for application in reaching this goal. A variety of questions to be considered include:

- How can we—across institutions and organizations around the globe—recruit new minds and novel talent and expertise to the scientific challenges, roadblocks, and opportunities for UIV development?
- What are the most promising areas of biomedical and life science, technology, and engineering from which to draw?
- How do we define the UIV challenges and opportunities in a way that the knowledge, skills, and processes of other life sciences, technology, and engineering worlds can be more readily applied to UIV development—what kinds of ‘on-ramps’ or ‘ladders’ are required to facilitate inter-disciplinary problem-solving?
- How do we foster and sustain partnerships (beyond financial incentives) linking divergent scientific or technological disciplines toward the common goal of a universal influenza vaccine?
- How do we build virtual or physical environments that promote convergent research and development efforts toward a UIV
- What conditions or approaches are likely to attract private investment to pursuing more novel, high-risk investments in UIV development?
- What role does public funding have in driving innovation given the tension between fiscal stewardship and the often high-risk/high-reward nature of investment in novel, innovative work?

Answers to these questions and more will begin to shape a blueprint for an innovation architecture that can mobilize the broadest set of human, technical, and financial resources that are commensurate with the size and urgency of the threat and the emerging scientific and market opportunities for UIV.

To further support this call to action, the diverse group gathered will be engaged to provide critical review and input to ongoing work of the Sabin initiative exploring the potential of a new mission-focused enterprise that recognizes the urgency and importance of achieving successful development of a UIV. In the context of the following broad design principles for such an effort, a series of potential models for organizing will be presented, discussed, and debated:

- Enable sustained and dedicated focus on the end-goal of UIV development and global access.
- Complement activities of existing stakeholders in the UIV ecosystem, while emphasizing the need for partnership across the value-chain to be successful.
- Provide catalytic funding to unlock challenges that impede progress.
- Embed the concept of transformational change into the DNA of the entity, as there is a need to take risks commensurate with the potential benefit of a universal influenza vaccine.

This rich day of inspired thinking and discussion is designed to shape the concrete next steps that can be promoted and supported to better organize, amplify, and diversify the communities exposed and responding to our call to action and the need to do more than business as usual in addressing the unique global health problem of influenza.