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PRESS RELEASE

CONTACT:
Darien Sutton
215-898-3988 | dsutton@wistar.org

The Wistar Institute Recruits Torben Schiffner, Ph.D., to Advance Next-Generation Immune Therapies

Schiffner merges biology, AI and reverse vaccinology to target HIV & emerging pandemic threats

PHILADELPHIA — (June 10, 2026) —The Wistar Institute, an international biomedical research leader in cancer, immunology, and infectious disease, announces the recruitment of **Torben Schiffner, Ph.D.**, to its Vaccine & Immunotherapy Center. Schiffner is a vaccinologist whose work integrates molecular biology, AI-based protein design and computational modeling to engineer innovative immunogens. His research tackles highly-mutating viruses—HIV, alphaviruses and emerging pathogens—by developing more precise and durable immune responses.

"Recruiting Torben underscores Wistar's commitment to pushing the boundaries of immunotherapy design," said David B. Weiner, Ph.D., Wistar EVP, director of the Vaccine & Immunotherapy Center and W.W. Smith Charitable Trust Distinguished Professor in Cancer Research. "By integrating AI with experimental biology, his work redefines how we approach rapidly mutating viruses and positions Wistar at the forefront of next-generation immune therapies."

Schiffner specializes in reverse vaccinology 2.0, an approach that starts by analyzing immune responses from infected individuals to identify antibodies with ideal properties such as particularly broad neutralization of highly diverse viruses. These antibodies then serve as a blueprint to design immunogens that induce similar antibodies by vaccination. This contrasts with how traditional immune therapies are created—a trial and error process with numerous iterations taking place before understanding molecular mechanisms and landing on a version that maximizes efficacy.

Reverse vaccinology 2.0 uses computational tools to design more precise immunogen candidates from the outset. By identifying "points of weakness" on the pathogen surface, this approach enables scientists to focus on the most promising targets earlier in the process.
"Reverse vaccinology 2.0 uses existing knowledge to intelligently design something that induces the exact type of antibody response to specifically engage a pathogen in the most effective way," said Schiffner.

This approach is especially critical for viruses that rapidly evolve. Many viruses—like HIV—have no therapies because they are so variable and mutate incredibly fast, allowing them to evade immune recognition.

Schiffner aims to develop immune therapies that stimulate broadly neutralizing antibodies (bnAbs), antibodies capable of attacking multiple variants of a virus by recognizing conserved regions that are needed for the virus to function. His lab focuses on engaging early antibody *precursors* that have the potential to become broadly neutralizing antibodies. He wants to guide the development of these precursors methodically, through a stepwise process to become bnAbs.

"We can compare an antibody's development to training a gifted child to become a rocket scientist—training for both happens in stages and builds over time," said Schiffner. "A broadly neutralizing antibody doesn't start out fully formed. It requires a series of carefully guided steps to acquire the mutations needed to recognize a virus effectively. So, we make one immunogen that engages the precursors of a broadly neutralizing antibody and put the first few mutations in. Then we add a different immunogen that picks up where the first mutation left off. It re-engages the same B cells and puts the next number of mutations in, and so on."

To achieve this, Schiffner's lab designs a series of immunogens—molecules that trigger the immune response—and progressively fine tunes and guides antibody development along a defined path. Each immunogen builds on the previous, training the immune system to produce increasingly effective responses.

Schiffner combines computational and experimental approaches to design and test immunogens. Using AI and protein modeling, his team creates molecules that target conserved regions across virus strains and engage the unmutated precursors. These designs are validated and refined through laboratory techniques such as directed evolution and high-throughput screening.

"My lab sits at the intersection of computational and experimental science," said Schiffner. "AI has completely transformed what we can do in terms of immunogen design while experimental techniques allow us to rapidly test and refine those designs to identify the most promising candidates that we hope will pave the way for "universal" immune therapies."

Schiffner obtained a B.S. degree in molecular biology at Universität Hamburg, a M.S. degree in virology at Imperial College London, and a Ph.D. in structure-based vaccine design, from Oxford University. Prior to Wistar, Schiffner was faculty in the Department of Immunology and Microbiology at Scripps Research Institute where he led an immunogen design group.

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3601 SPRUCE STREET, PHILADELPHIA, PA 19104
215-898-3700 | WISTAR.ORG

culture and commitment to biomedical collaboration and innovation, Wistar science leads to breakthrough early-stage discoveries and life science sector start-ups. Wistar scientists are dedicated to solving some of the world's most challenging problems in the field of cancer and immunology, advancing human health through early-stage discovery and training the next generation of biomedical researchers. wistar.org.

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