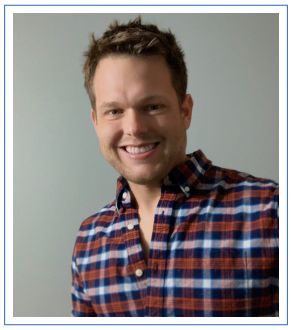

Jordan R. Willis

Ph.D.

Info

Born July 20th, 1985 Norfolk VA (USA)

Citizenship USA

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Profile

Objective Bio-coastal computationl, moldecular biologist and immunologist working in protein engineering and bioinformatics

- 16 years experience with molecular biology
- 12 years experience merging wet- and dry-lab technologies
- 12 years experience with protein design, modeling and bioinformatics
- 11 years experience with next generation sequencing and analysis
- 7 years experience with cell display technology
- 5 years experience with deep learning

Experience

11/2021- **Associate Director - Vaccine Design, Bioinformatics and AI**, *IAVI*, San Diego, CA.
Engineering vaccines and antibodies for any and all infectious diseases. Big data analytics, antibody repertoire analysis, software stacks, deep learning, protein design, and synthetic libraries.

01/2020-02/2022 **Senior Computational and Experimental Biologist**, *Twist*, San Francisco, CA.
Developed their antibody discovery platform. Develped TAO platform. Consulted for one year.

05/2019-01/2020 **Principal Scientist - Protein Engineer**, *Rejuvenate Bio*, San Diego, CA.
Engineer inducible systems, promoters and AAV capsid libraries.

05/2018-05/2019 **Senior Scientist - Computational Biologist**, *RubrYc Therapeutics*, San Carlos, CA.
Research and development of computational design/ML strategies for *de novo* functional peptide-protein interfaces.

06/2014-05/2018 **Research Associate**, *The Scripps Research Institute*, La Jolla, CA.
Fusing computation modeling, high-throughput sequencing, and library display technologies in order to engineer HIV vaccines.

08/2008-06/2014 **Graduate Student**, *Vanderbilt University*, Nashville, TN.
Computational biology PhD research in the area of antibody design. Engineer antibody multispecificity, interrogate antibody repertoires and investigate broadly neutralizing antibodies to HIV.

01/2007-05/2008 **Undergraduate Research Fellow**, *University of Missouri, Department of Chemistry*, Columbia, MO.
Lead optimization drug discovery of hypoxic-cell targeting molecules that treat tumors.

Education

2008-2014 **Ph.D. Chemical and Physical Biology**, *Vanderbilt University Medical Center*, Nashville, TN.
Rational Antibody Design: From Mechanisms of Specificity, to Novel Vaccine Strategies
Advisors: James E. Crowe, Jr., M.D., Jens Meiler, Ph.D.

2004-2008 **B.S. Chemistry**, *Northwest Missouri State University*, Maryville, MO.

2004-2008 **B.A. Molecular Biology**, *Northwest Missouri State University*, Maryville, MO.

Specialized Computational Skills

Languages PYTHON, Java, C++, SQL, LaTeX, Javascript

Database Spark, Hadoop, MySQL, MongoDB, SQLite

Tools AWS, Cloud Computing, Jupyter Notebook, Git, Geneious

Libraries BioPython, Rosetta, Keras, TensorFlow, PyTorch, Pandas

Specialized Experimental Skills

Dry-Lab Molecular modeling, design and big data analysis

- NGS Analysis
- Development and application of the software suite Rosetta/PyRosetta
- Big data analytics with Python and Spark
- Protein structure prediction and design
- Similarity search and alignments
- Phylogeny and evolution
- Supercomputer cluster designer (AWS) and administrator
- Deep learning model engineering

Wet-Lab Protein production and analysis

- Mammalian library display and preparation
- Lenti virus library engineering
- Cell sorting
- Biopysical characterization of protein-protein interactions - ELISA, SPR, and Octet
- Amplicon library preparation for NGS
- Antibody library assembly

Honors and Awards

2022	CHAVD Young Investigator Award
2014-2018	Ragon Institute Fellow
2007-2008	NIH 5 T23 AI060571 HIV/AIDS Research Training Program
2010-2011	Steven's Research Scholarship, University of Missouri
2007-2008	Mary Marie Smith Chemistry Scholarship, Northwest Missouri State University
2006-2007	J. Gordon Strong Chemistry Scholarship, Northwest Missouri State University
2004-2008	Tower Scholar, Northwest Missouri State University

Research Publications

First or Co-First Author

2022 Melzi E, **Willis JR**, Ma KM, Lin YC, Kratochvil S, Berndsen ZT, Landais EA, Kalyuzhniy O, Nair U, Warner J, Steichen JM, Kalyuzhniy A, Le A, Pecetta S, Perez M, Kirsch K, Weldon SR, Falcone S, Himansu S, Carfi A, Sok D, Ward AB, Schief WR, Batista FD, Membrane-bound mRNA immunogens lower the threshold to activate HIV Env V2 apex-directed broadly neutralizing B cell precursors in humanized mice. *Immunity* **None**: None

2022 **Willis JR**, Berndsen ZT, Ma KM, Steichen JM, Schiffner T, Landais E, Liguori A, Kalyuzhniy O, Allen JD, Baboo S, Omorodion O, Diedrich JK, Hu X, Georgeson E, Phelps N, Eskandarzadeh S, Groschel B, Kubitz M, Adachi Y, Mullin TM, Alavi NB, Falcone S, Himansu S, Carfi A, Wilson IA, Yates JR 3rd, Paulson JC, Crispin M, Ward AB, Schief WR, Human immunoglobulin repertoire analysis guides design of vaccine priming immunogens targeting HIV V2-apex broadly neutralizing antibody precursors. *Immunity* **None**: None

2019 Steichen JM, Lin YC, Havenar-Daughton C, Pecetta S, Ozorowski G, **Willis JR**, Toy L, Sok D, Liguori A, Kratochvil S, Torres JL, Kalyuzhniy O, Melzi E, Kulp DW, Raemisch S, Hu X, Bernard SM, Georgeson E, Phelps N, Adachi Y, Kubitz M, Landais E, Umotoy J, Robinson A, Briney B, Wilson IA, Burton DR, Ward AB, Crotty S, Batista FD, Schief WR, A generalized HIV vaccine design strategy for priming of broadly neutralizing antibody responses. *Science* **366**: None

2016 **Willis JR**, Finn JA, Briney B, Sapparapu G, Singh V, King H, LaBranche CC, Montefiori DC, Meiler J, Crowe JE Jr, Long antibody HCDR3s from HIV-naive donors presented on a PG9 neutralizing antibody background mediate HIV neutralization. *Proc Natl Acad Sci U S A* **113**: 4446-51

2015 **Willis JR**, Sapparapu G, Murrell S, Julien JP, Singh V, King HG, Xia Y, Pickens JA, LaBranche CC, Slaughter JC, Montefiori DC, Wilson IA, Meiler J, Crowe JE Jr, Redesigned HIV antibodies exhibit enhanced neutralizing potency and breadth. *J Clin Invest* **125**: 2523-31

2013 **Willis JR**, Briney BS, DeLuca SL, Crowe JE Jr, Meiler J, Human germline antibody gene segments encode polyspecific antibodies. *PLoS Comput Biol* **9**: e1003045

2013 Combs SA, Deluca SL, Deluca SH, Lemmon GH, Nannemann DP, Nguyen ED, **Willis JR**, Sheehan JH, Meiler J, Small-molecule ligand docking into comparative models with Rosetta. *Nat Protoc* **8**: 1277-98

Other Author

2021 Le KH, Adolf-Bryfogle J, Klima JC, Lyskov S, Labonte J, Bertolani S, Burman SSR, Leaver-Fay A, Weitzner B, Maguire J, Rangan R, Adrianowycz MA, Alford RF, Adal A, Nance ML, Wu Y, **Willis J**, Kulp DW, Das R, Dunbrack RL Jr, Schief W, Kuhlman B, Siegel JB, Gray JJ, PyRosetta Jupyter Notebooks Teach Biomolecular Structure Prediction and Design. *Biophysicist (Rockv)* **2**: 108-122

2022 Yuan TZ, Garg P, Wang L, **Willis JR**, Kwan E, Hernandez AGL, Tuscano E, Sever EN, Keane E, Soto C, Mucker EM, Fouch ME, Davidson E, Doranz BJ, Kailasan S, Aman MJ, Li H, Hooper JW, Saphire EO, Crowe JE, Liu Q, Axelrod F, Sato AK, Rapid discovery of diverse neutralizing SARS-CoV-2 antibodies from large-scale synthetic phage libraries. *MAbs* **14**: 2002236

2020 Soto C, Finn JA, **Willis JR**, Day SB, Sinkovits RS, Jones T, Schmitz S, Meiler J, Branchizio A, Crowe JE Jr, PyIR: a scalable wrapper for processing billions of immunoglobulin and T cell receptor sequences using IgBLAST. *BMC Bioinformatics* **21**: 314

2020 Briney BS, **Willis JR**, Finn JA, McKinney BA, Crowe JE Jr, Correction: Tissue-Specific Expressed Antibody Variable Gene Repertoires. *PLoS One* **15**: e0228412

2017 Kulp DW, Steichen JM, Pauthner M, Hu X, Schiffner T, Liguori A, Cottrell CA, Havenar-Daughton C, Ozorowski G, Georgeson E, Kalyuzhniy O, **Willis JR**, Kubitz M, Adachi Y, Reiss SM, Shin M, de Val N, Ward AB, Crotty S, Burton DR, Schief WR, Structure-based design of native-like HIV-1 envelope trimers to silence non-neutralizing epitopes and eliminate CD4 binding. *Nat Commun* **8**: 1655

2017 Sarkar U, Hillebrand R, Johnson KM, Cummings AH, Phung NL, Rajapakse A, Zhou H, **Willis JR**, Barnes CL, Gates KS, Application of Suzuki-Miyaura and Buchwald-Hartwig Cross-coupling Reactions to the Preparation of Substituted 1,2,4-Benzotriazine 1-Oxides Related to the Antitumor Agent Tirapazamine. *J Heterocycl Chem* **54**: 155-160

2016 Hicar MD, Chen X, Sulli C, Barnes T, Goodman J, Sojar H, Briney B, **Willis J**, Chukwuma VU, Kalams SA, Doranz BJ, Spearman P, Crowe JE Jr, Human Antibodies that Recognize Novel Immunodominant Quaternary Epitopes on the HIV-1 Env Protein. *PLoS One* **11**: e0158861

2016 Boehme KW, Ikizler M, Iskarpatyoti JA, Wetzel JD, **Willis J**, Crowe JE Jr, La-Branche CC, Montefiori DC, Wilson GJ, Dermody TS, Engineering Recombinant Reoviruses To Display gp41 Membrane-Proximal External-Region Epitopes from HIV-1. *mSphere* **1**: None

2016 Finn JA, Koehler Leman J, **Willis JR**, Cisneros A 3rd, Crowe JE Jr, Meiler J, Improving Loop Modeling of the Antibody Complementarity-Determining Region 3 Using Knowledge-Based Restraints. *PLoS One* **11**: e0154811

2014 Briney BS, **Willis JR**, Finn JA, McKinney BA, Crowe JE Jr, Tissue-specific expressed antibody variable gene repertoires. *PLoS One* **9**: e100839

2012 Briney BS, **Willis JR**, Hicar MD, Thomas JW 2nd, Crowe JE Jr, Frequency and genetic characterization of V(DD)J recombinants in the human peripheral blood antibody repertoire. *Immunology* **137**: 56-64

2012 Briney BS, **Willis JR**, Crowe JE Jr, Human peripheral blood antibodies with long HCDR3s are established primarily at original recombination using a limited subset of germline genes. *PLoS One* **7**: e36750

2011 Joyner AS, **Willis JR**, Crowe JE Jr, Aiken C, Maturation-induced cloaking of neutralization epitopes on HIV-1 particles. *PLoS Pathog* **7**: e1002234

Accepted **Jordan R. Willis**, William J. Fulp, Allan C. deCamp, Oleksandr Kalyuzhniy, Christopher A. Cottrell,Sergey Menis, Greg Finak, Lamar Ballweber-Fleming, Abhinaya Srikanth, Jason R. Plyler, Torben Schiffner, Alessia Liguori, Farhad Rahaman, Angela Lombardo, Vincent Philiponis, Rachael E. Whaley, Aaron Seese, Joshua Brand, Alexis M. Ruppel, Wesley Hoyland, Nicole L. Yates, LaTonya D. Williams, Kelli Greene, Hongmei Gao, Celia R. Mahoney, Martin M. Corcoran, Alberto Cagigi, Alison Taylor, David M. Brown, David R. Ambrozak, Troy Sincomb, Xiaozhen Hu, Ryan Tingle, Erik Georgeson, Saman Eskandarzadeh, Nushin Alavi, Danny Lu, Tina-Marie Mullen, Michael Kubitz, Bettina Groschel, Janine Maenza, Orpheus Kolokythas,Nadia Khati, Jeffrey Bethony, Shane Crotty, Mario Roederer, Gunilla B. Karlsson Hedestam, Georgia D. Tomaras, David Montefiori, David Diemert, Richard A. Koup, Dagna S. Laufer, M. Juliana McElrath, Adrian B. McDermott, William R. Schief, Science, 2022

References

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