Stanford

Peter S. Kim

Virginia and D. K. Ludwig Professor of Biochemistry

CONTACT INFORMATION

- **Administrative Contacts**

  Cynthia Nogoy / Amanda O'Neal - Research Administrative Specialists

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  Tel 650-498-7602

Bio

ACADEMIC APPOINTMENTS

- Professor, Biochemistry
- Member, Bio-X
- Member, Maternal & Child Health Research Institute (MCHRI)
- Faculty Fellow, Stanford ChEM-H
- Member, Wu Tsai Neurosciences Institute

ADMINISTRATIVE APPOINTMENTS

- Lead Investigator, Infectious Disease Initiative, Chan Zuckerberg Biohub, (2017- present)
- Institute Scholar, Stanford ChEM-H, (2014- present)
- Virginia & D.K. Ludwig Professor of Biochemistry, Stanford University School of Medicine, (2014- present)
- President, Merck Research Laboratories, Merck & Co., Inc., (2003-2013)
- Executive Vice President, Merck Research Laboratories, Merck & Co., Inc., (2001-2002)
- Associate Head, Department of Biology, MIT, (1999-2001)
- Investigator, Howard Hughes Medical Institute, (1997-2001)
- Professor of Biology, MIT, (1995-2001)
- Associate Investigator, Howard Hughes Medical Institute, (1993-1997)
- Member, Whitehead Institute for Biomedical Research, (1992-2001)
- Associate Professor of Biology, MIT, (1992-1995)
- Assistant Investigator, Howard Hughes Medical Institute, (1990-1993)
- Assistant Professor of Biology, MIT, (1988-1992)
- Associate Member, Whitehead Institute for Biomedical Research, (1988-1992)
- Whitehead Fellow, Whitehead Institute for Biomedical Research, (1985-1988)

HONORS AND AWARDS

- Arthur Kornberg and Paul Berg Lifetime Achievement Award in Biomedical Sciences, Stanford University (2018)
- Member, National Academy of Sciences (1997)
- Member, National Academy of Medicine (formerly, Institute of Medicine) (2000)
- Member, National Academy of Engineering (2016)
- Fellow, American Academy of Arts and Sciences (2008)
- Doctor of Science, Honoris Causa, Pohang University of Science and Technology (2011)
- Presidents' Circle, The National Academies (2006)
- Harvey Lecture, The Harvey Society (2002)
- Fellow, Biophysical Society (1999)
- Fellow, American Association for the Advancement of Science (1999)
- Hans Neurath Award, The Protein Society (1999)
- Ho-Am Prize for Basic Science, The Samsung Foundation (1998)
- Fellow, American Academy of Microbiology (1997)
- DuPont Merck Young Investigator Award, The Protein Society (1994)
- Eli Lilly Award in Biological Chemistry, American Chemical Society (1994)
- NAS Award in Molecular Biology, National Academy of Sciences (1993)

BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Medical Advisory Board, Howard Hughes Medical Institute (2016 - present)
- Council, National Academy of Sciences (2015 - 2018)
- Scientific Advisory Board, Vaccine Research Center, NIAID, NIH (2014 - present)
- MIT Corporation Visiting Committee, Department of Biology, MIT (2004 - present)
- Board of Scientific Advisors, Jane Coffin Childs Memorial Fund (2015 - 2018)
- Advisory Council, Department of Molecular Biology, Princeton University (2015 - present)
- External Scientific Advisory Board, Harvard Program in Therapeutic Science, HMS (2014 - present)

PROFESSIONAL EDUCATION

- A.B., Cornell University , Chemistry (1979)
- Ph.D., Stanford University School of Medicine , Biochemistry (1985)

LINKS

- the Peter Kim Lab: http://www.peterkimlab.stanford.edu

Research & Scholarship

CURRENT RESEARCH AND SCHOLARLY INTERESTS

We are studying the mechanism of viral membrane fusion and its inhibition by drugs and antibodies. We use the HIV envelope protein (gp120/gp41) as a model system. Some of our studies are aimed at creating an HIV vaccine that elicits antibodies against a transient, but vulnerable, intermediate in the membrane-fusion process, called the pre-hairpin intermediate.

We are also interested in protein surfaces that are referred to as "non-druggable". These surfaces are defined empirically based on failure to identify small, drug-like molecules that bind to them with high affinity and specificity. Some of our efforts are aimed at characterizing select non-druggable targets. We are also developing methods to identify ligands for non-druggable protein surfaces.

Teaching

STANFORD ADVISEES

Doctoral Dissertation Reader (AC)

David Chmielewski, Alicja Cygan, Raphael Eguchi, Abel Ferrel, Julie Fogarty, Emily Gale, Cooper Galvin, Sean Hunter, Lauren Lahey, Julia McKechnie, Christopher Ritchie, Cole Sitron, Gergana Vandova, Bette Webster, Nancy Zhao

Postdoctoral Faculty Sponsor

Yu-Hsien Hwang-Fu, Abigail Powell, Shaogeng Tang

Doctoral Dissertation Advisor (AC)

Benjamin Bell, Clayton Brown, Maria Filsinger Interrante, Michael Lyons, Payton Weidenbacher

Orals Evaluator

Bjoern Erik Wulff

GRADUATE AND FELLOWSHIP PROGRAM AFFILIATIONS

- Biochemistry (Phd Program)
- Biophysics (Phd Program)
- Cancer Biology (Phd Program)
- Chemical and Systems Biology (Phd Program)
- Immunology (Phd Program)
- Microbiology and Immunology (Phd Program)
- Molecular and Cellular Physiology (Phd Program)

Publications

PUBLICATIONS

- **Protect, modify, deprotect (PMD): A strategy for creating vaccines to elicit antibodies targeting a specific epitope** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Weidenbacher, P. A., Kim, P. S.
  2019; 116 (20): 9947–52

- **Vaccination with peptide mimetics of the gp41 prehairpin fusion intermediate yields neutralizing antisera against HIV-1 isolates** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Bianchi, E., Joyce, J. G., Miller, M. D., Finnefrock, A. C., Liang, X., Finotto, M., Ingallinella, P., McKenna, P., Citron, M., Ottinger, E., Hepler, R. W., Hrin, R., Nahas, et al
  2010; 107 (23): 10655-10660

- **A human monoclonal antibody neutralizes diverse HIV-1 isolates by binding a critical gp41 epitope** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Miller, M. D., Geleziunas, R., Bianchi, E., Lennard, S., Hrin, R., Zhang, H. C., Lu, M. Q., An, Z. Q., Ingallinella, P., Finotto, M., Mattu, M., FINNEFROCK, A. C., Bramhill, et al
  2005; 102 (41): 14759-14764

- **Protein design of an HIV-1 entry inhibitor** *SCIENCE*
  Root, M. J., Kay, M. S., Kim, P. S.

2001; 291 (5505): 884-888

- **Mechanisms of viral membrane fusion and its inhibition** *ANNUAL REVIEW OF BIOCHEMISTRY*
  Eckert, D. M., Kim, P. S.
  2001; 70: 777-810

- **Inhibiting HIV-1 entry: Discovery of D-peptide inhibitors that target the gp41 coiled-coil pocket** *CELL*
  Eckert, D. M., Malashkevich, V. N., Hong, L. H., Carr, P. A., Kim, P. S.
  1999; 99 (1): 103-115

- **HIV entry and its inhibition** *CELL*
  Chan, D. C., Kim, P. S.
  1998; 93 (5): 681-684

- **Influenza hemagglutinin is spring-loaded by a metastable native conformation** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*
  Carr, C. M., Chaudhry, C., Kim, P. S.
  1997; 94 (26): 14306-14313

- **Core structure of gp41 from the HIV envelope glycoprotein** *CELL*
  Chan, D. C., Fass, D., Berger, J. M., Kim, P. S.
  1997; 89 (2): 263-273

- **A SPRING-LOADED MECHANISM FOR THE CONFORMATIONAL CHANGE OF INFLUENZA HEMAGGLUTININ** *CELL*
  Carr, C. M., Kim, P. S.
  1993; 73 (4): 823-832