

David W. Colby, PhD
Curriculum Vitae

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University of California, San Francisco
Institute for Neurodegenerative Diseases
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Education and Academic Research Experience

2005-Present, Postdoctoral research:
Institute for Neurodegenerative Diseases, **University of California, San Francisco**
Advisor: Stanley B. Prusiner
Fellow of the **Jane Coffin Childs** Memorial Fund for Medical Research

2005 PhD Chemical Engineering
Massachusetts Institute of Technology (MIT)
Advisors: K. Dane Wittrup and Vernon M. Ingram (Biology)
National Science Foundation Graduate Research Fellow

2000 BS Chemical Engineering
BS Chemistry
Virginia Commonwealth University (VCU)

Teaching Experience

Teaching Assistant, MIT Department of Chemical Engineering
10.28 Biological Engineering Lab, Fall 2003

Laboratory Instructor, VCU Department of Physics
Introductory Physics Laboratory, Spring 1998

Teaching Assistant, VCU Department of Chemical Engineering
Material and Energy Balances, Fall 1997

Honors and Awards

Fellow of the Jane Coffin Childs Memorial Fund for Medical Research (2006-2008)
Giannini Family Foundation Postdoctoral Fellowship (declined)
National Science Foundation Graduate Research Fellow (2000-2003)
John Grover Fellow (MIT, 2000)
Entrepreneurial Scholarship in Chemical Engineering (VCU 1998-2000)
Phi Kappa Phi Honor Society (2000)
Golden Key National Honor Society (2000)

Publications

1. **David W. Colby**, Giuseppe Legname, Shuyi Wang, Steven DeArmond, Stanley Prusiner. Protease-sensitive synthetic prions. (In preparation).
2. **David W. Colby**, Giuseppe Legname, Stanley Prusiner. Creation of synthetic prions in mice expressing full-length, wild-type prion protein. (In preparation).
3. Brian Y. Feng, Brandon H. Toyama, Holger Wille, **David W. Colby**, Sean R. Collins, Barnaby C.H. May, Stanley B. Prusiner, Jonathan Weissman and Brian K. Shoichet. Promiscuous Small-molecule Aggregates Inhibit Amyloid Polymerization. *Nat. Chem. Biol.*, v.4, pp., 2008.
4. **David W. Colby**, Johnson Zhang, Shuyi Wang, Darlene Groth, Giuseppe Legname, Detlev Reisner, and Stanley B. Prusiner. Prion Detection by an Amyloid Seeding Assay. *Proc. Natl. Acad. Sci.* **v.104**, pp. 2091-9, 2007.
5. **David W. Colby**, John Cassady, Grace Lin, Vernon Ingram, K. Dane Wittrup. Stochastic kinetics of intracellular huntingtin aggregate formation. *Nat. Chem. Biol.*, **v.2**, pp. 319-23, 2006
6. **David W. Colby**, Yijia Chu, John Cassady, Helen Zazulak, Martin Duenwald, Jack M. Webster, Anne Messer, Susan Lindquist, Vernon Ingram, K. Dane Wittrup. Potent inhibition of huntingtin aggregation and cytotoxicity by a disulfide bond-free single domain intrabody. *Proc. Natl. Acad. Sci.* **v.101**, pp. 17616-21, 2004
7. **David W. Colby**, Payal Garg, Tina Holden, Ginger Chao, Jack M. Webster, Anne Messer, Vernon M. Ingram, K. Dane Wittrup. Development of a Human Light Chain Variable Domain (V_L) Intracellular Antibody against Huntingtin via Yeast Surface Display. *J. Mol. Biol.* **v.342**, pp. 901-12, 2004
8. **David W. Colby**, Brenda Kellog, Christilynn P. Graff, Yik A. Yeung, Jeffrey S. Swers, K. Dane Wittrup. Engineering Antibody Affinity by Yeast Surface Display. *Methods in Enzymology* **v.388**, pp. 348-58, 2004
9. Michael J. Feldhaus, Ronald W. Siegel, Lee K. Opresko, J.R. Coleman, J.M. Feldhaus, Yik A. Yeung, J.R. Cochran, Peter Heinzelman, **David Colby**, Jefferey Swers, C. Graff, H.S. Wiley, K. Dane Wittrup. Flow-cytometric isolation of human antibodies from a nonimmune *Saccharomyces cerevisiae* surface display library. *Nat Biotech.* **v.21** pp.163-70, 2003.
10. Dimitry Pestov, Natalia Levit, **David Colby**, Gary Tepper. Chemically Sensitive Nanoparticles Developed from Rapid Expansion of Supercritical Solutions, American Chemical Society, Division of Polymeric Materials: Science and Engineering, PMSE, 2000, **83**, p. 538-539

Research Supervision and Teaching

University of California, San Francisco

Supervision of one Staff Research Associate

Massachusetts Institute of Technology (Supervised undergraduate research projects):

Dobrin Draganov (Current affiliation: *Harvard Univ. graduate student*) Effect of huntingtin-binding peptides on cell viability

Nancy Chen (*New York Univ. Med student*) Quantitative analysis of peptide transduction domain mediated peptide uptake

Yijia (Colin) Chu. (*Univ. of Michigan Med student*) Effect of engineered intracellular antibodies on huntingtin aggregation in transiently transfected neuronal cells

Payal Garg (*Univ. of Medicine and Dentistry New Jersey Med student*) Inhibition of huntingtin aggregation by a single domain antibody against huntingtin monitored by light scattering

Katarzyna Puchala (*MIT graduate student*) Analysis of apoptosis in neuronal cells expressing the huntingtin transgene

Grace Lin (*UCSF pharmacy school*) Quantitative analysis of neuronal huntingtin aggregation

John Cassady (*MIT graduate student*) Effect of huntingtin expression on cell viability

Christine Nee. Small molecule inhibitors of huntingtin aggregation

Presentations

Invited oral presentations:

American Institute of Chemical Engineers, Nov 2007

Biomedical Engineering Society, October 2007

International Conference on Biomolecular Engineering, Jan 2007

Fairchild Prion Review, Jan 2007

3rd Annual Synthetic Mammalian Prion Meeting, Dec 2006

2nd Annual Synthetic Mammalian Prion Meeting, Nov 2005

Biomedical Engineering Society, October 2004

American Institute of Chemical Engineers Annual Conference, Nov 2003

13th Annual Mid Atlantic Bio-Engineering Consortium, April 2000

Engineering the Future of Medicine, Seminar Series, Virginia Commonwealth University, Feb 2000

2nd Conference on the Development of Technology in Medicine for Virginia, Nov 1999

Poster Presentations

American Institute of Chemical Engineers, Nov 2007
Jane Coffin Childs annual symposium, Oct 2007
Gordon Conference on CAG triplet repeat disorders, May 2007
Prion 2006, October 2006
Gordon Conference on CAG triplet repeat disorders, June 2005
CAGn Hereditary Disease Foundation Conference, August 2004
Gordon Conference on CAG triplet repeat disorders, May 2003
CAGn Hereditary Disease Foundation Conference, May 2002
Gordon Conference on CAG triplet repeat disorders, May 2001
Merging Micro-Technologies: The Biochip and the Microchip, Jan 2000
5th International Symposium of Supercritical Fluid Technology, April 2000
High Technology Materials Center Eighth Annual Symposium, Nov 1999
Advanced Polymers via Macromolecular Engineering, Aug 1999

Funded proposals and competitive research awards

“Structural basis of synthetic prion infectivity,” Jane Coffin Childs Memorial Fund for Medical Research, Postdoctoral Fellowship, 2006-2008 (\$92,000)
“Structural basis of synthetic prion infectivity,” Giannini Family Foundation Postdoctoral Fellowship, 2006 (declined) (\$121,000)
“Therapeutic antibodies for Huntington’s disease,” David Colby and K. Dane Wittrup, Hereditary Disease Foundation, 2002-2005 (\$159,000)
National Science Foundation Graduate Research Fellowship, 2000-2003 (\$89,000)
“Design and evaluation of a pervaporator for membrane separations,” VCU undergraduate research grant, 1999 (\$500)

Service Activities

Founding President, VCU Chapter of American Institute of Chemical Engineers, 1998-1999
Founding President, VCU Engineering Honor Society (later Tau Beta Pi), 1998-1999
Volunteer Chemistry Tutor, Open High School, Richmond Public Schools, 1997-1999
Volunteer Tour Guide, VCU School of Engineering, 1996-1998