

CURRICULUM VITAE

ARUN P. WIITA

ADDRESS:

Department of Biological Sciences
Columbia University
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EDUCATION:

M.D.-Ph.D. Candidate, Columbia University, NY, 2002-2009 (anticipated)
M.D., College of Physicians and Surgeons, 2009 (anticipated)
Ph.D., Graduate Program in Neurobiology and Behavior, 2008 (anticipated)
M.Phil., Graduate Program in Neurobiology and Behavior, 2006
Thesis title: "Probing Chemistry and Catalysis in Single Protein Molecules with Mechanical Force"
Thesis adviser: Julio M. Fernandez, Ph.D., Dept. of Biological Sciences
A.B., Chemistry, *magna cum laude*, Princeton University, NJ, 2002
Certificate in Financial Economics
Thesis title: "Probing the Design of the Smac/XIAP complex"
Thesis adviser: George L. McLendon, Ph.D., Dept. of Chemistry
International Baccalaureate Diploma, Atlanta International School, GA, 1998
Achieved with 45 of 45 possible points
Extra Certificate in Higher Level Mathematics

PROFESSIONAL MEMBERSHIPS:

Biophysical Society
American Chemical Society
Society for Neuroscience

RESEARCH EXPERIENCE:

Columbia University:
Lab of Julio Fernandez, Dept. of Biological Sciences, Ph.D. thesis work, 2004-
-Protein biophysics and biochemistry using single molecule force spectroscopy
Lab of Richard Vallee, Center for Neurobiology and Behavior, Ph.D. rotation, 2003
-Cell biology and biochemistry of cytoplasmic dynein
Lab of Jan Kitajewski, Dept. of Pathology, summer research, 2000 & 2001
-Molecular biology of tumor angiogenesis
Princeton University:
Lab of George McLendon, Dept. of Chemistry, senior thesis work, 2001-2002
-Bioorganic chemistry and protein biochemistry relating to apoptotic proteins
Johnson & Johnson, North Brunswick, NJ:
Consumer Products Company, Analytical Chemistry Employee, 2000
-FPLC analysis of synthetic compounds

EXTERNAL CLINICAL EXPERIENCE:

Clinical tutorial in HIV patient care/dermatology led by Dr. Marcus Conant, UCSF, 2004
Emergency department volunteer, Hospital of the University of Pennsylvania, 2001

TEACHING EXPERIENCE:

Teaching Assistant, Cellular Physiology of Disease, 2007
Teaching Assistant, Systems and Developmental Neurobiology, 2005
Group tutorial leader, Micro- and Macroeconomics, 2000-2001

OTHER EXPERIENCE/EXTRACURRICULAR ACTIVITIES:

Graduate Student Fellow, Columbia University Science & Technology Ventures, 2007
Senior Editorial Staff Member, Columbia Undergraduate Science Journal, 2005-2007
President, Columbia P&S Chapter, Physicians for Human Rights, 2003-2004
Co-Chair, Columbia MD-PhD Student Advisory Committee, 2003-2004
Minority Affairs Adviser, Mathey Residential College, Princeton U., 2000-2001
President, Princeton University Club Tennis, 1999-2000

AWARDS and HONORS:

First prize, student/post-doc poster competition, Gordon Research Conference, 2006
N.I.H. Medical Scientist Training Program grant recipient, 2002-
Sigma Xi Book Award for undergraduate thesis research, 2002
Elected to Phi Beta Kappa honor society, 2002
Elected to Sigma Xi honor society, 2002

JOURNAL PUBLICATIONS:

Perez-Jimenez, R., **Wiita, A.P.**, Kosuri, P., Larrea-Rodriguez, D., Sanchez-Ruiz, J.M., and Fernandez, J.M. Single molecule force-clamp spectroscopy reveals evolutionary signatures of thioredoxin activity. *In preparation* (2007).

Ainavarapu, S.R.K., **Wiita, A.P.**, Dougan, L., Uggerud, E., and Fernandez, J.M. Transition state properties of a solution phase bimolecular chemical reaction measured at the single-bond level. *In preparation* (2007).

Ainavarapu, S.R.K., **Wiita, A.P.**, Huang, H.H., and Fernandez, J.M. A single-molecule assay to directly identify solvent accessible disulfide bonds and probe their effect on protein folding. *J. Am. Chem. Soc.*, accepted (2007).

Szozzkiewicz, R., Ainavarapu, S.R.K., **Wiita, A.P.**, Perez-Jimenez, R., Sanchez-Ruiz, J.M., and Fernandez, J.M. Dwell time analysis of a single-molecule mechanochemical reaction. *Langmuir*, Epub ahead of print (2007).

Wiita, A.P., Perez-Jimenez, R., Walther, K.A., Gräter, F., Berne, B.J., Holmgren, A., Sanchez-Ruiz, J.M., and Fernandez, J.M. Probing the chemistry of thioredoxin catalysis with force. *Nature*, **150**, 124-127 (2007).

Ainavarapu, S.R.K. *, Brujić, J. *, Huang, H.H. *, **Wiita, A.P.**, Lu, H., Li, L., Walther, K.A., Carrion-Vazquez, M., Li, H., and Fernandez, J.M. Contour length and refolding rate of a small protein controlled by engineered disulfide bonds. *Biophys. J.*, **92**, 225-233 (2007).

Wiita, A.P., Ainavarapu, S.R.K., Huang, H.H., and Fernandez, J.M. Force-dependent chemical kinetics of disulfide bond reduction observed with single-molecule techniques. *Proc. Natl. Acad. Sci. USA* **103**, 7222-7227 (2006). (From the Cover; see also Commentary by Discher, D.E., et al., *Proc. Natl. Acad. Sci. USA* **103**, 7533-7534 (2006).)

Kipp, R.A., Case, M.A., Wist, A.D., Cresson, C.M., Carrell, M., Griner, E., **Wiita, A.**, Albiniaak, P.A., Shi, Y., Semmelhack, M.F., and McLendon, G.L. Molecular targeting of inhibitor of apoptosis proteins based on small molecule mimics of natural binding partners. *Biochemistry* **41**, 7344-7349 (2002).

PRESENTED ABSTRACTS/POSTERS:

Wiita, A.P., Perez-Jimenez, R., Walther, K.A., Gräter, F., Berne, B.J., Sanchez-Ruiz, J.M., and Fernandez, J.M. Probing the Chemistry of Thioredoxin Catalysis with Force. *Biophysical Society Meeting Abstracts* 2007.

Wiita, A.P., Perez-Jimenez, R., Walther, K.A., Sanchez-Ruiz, J.M., and Fernandez, J.M. Force-dependent Dynamics of Disulfide Bond Reduction by Thioredoxin. *Gordon Research Conference: Single Molecule Approaches to Biology*, New London, NH (2006). (First Prize Winner, Student/Post-doc Poster Competition)

Wiita, A.P., Ainavarapu, S.R.K., Huang, H.H., and Fernandez, J.M. Catalyzing Single Thiol/disulfide Exchange Reactions with Force: Pulling Biochemistry in a New Direction. *Biophysical Society Meeting Abstracts* 2006. (Finalist, Student Research Achievement Award)

Huang, H.H., Koti, A.S.R., **Wiita, A.P.**, Carrion-Vazquez M., and Fernandez, J.M. Liberation of Sequestered Residues by Forced Rupture of Single Disulfide Bridges. *Biophysical Society Meeting Abstracts* 2005.

PRESENTED TALKS:

Probing chemistry and catalysis in single protein molecules with mechanical force. Chemistry/Biology Interface Seminar, Dept. of Chemistry, Columbia University (2007).

Force spectroscopy on single proteins. American Chemical Society National Meeting, San Francisco, CA (2006).

Force-dependent chemical kinetics of disulfide bond reduction observed with single molecule force clamp spectroscopy. Biophysical Society Meeting, Salt Lake City, UT (2006).

The reduction of single disulfide bonds catalyzed by mechanical force. Columbia University Center for Neurobiology and Behavior retreat, Princeton, NJ (2005).