

## CURRICULUM VITAE

**DATE:** September 2, 2013

**NAME:** Barbara Brodsky

**PRESENT TITLE:**

Research Professor  
Department of Biomedical Engineering  
Tufts University  
4 Colby St.  
Medford, MA 02155

**EDUCATION:**

Brandeis University	B.A.	1964	Physics
Harvard University	Ph.D.	1970	Biophysics (Advisor: Dr. E.R. Blout)

**POST-GRADUATE TRAINING:**

Postdoctoral researcher, National Institute of Dental Research, N.I.H. (with Dr. Karl Piez) 1970-1972  
Research Fellow, Dental Research Institute, University of Michigan (Dr. D. Dziewiatkowski) 1972- 1973  
Research Fellow, Laboratory of Molecular Biophysics, Oxford University (Dr. Andrew Miller) 1973-1975

**ACADEMIC APPOINTMENTS:**

Research Professor, Dept. of Biomedical Engineering, Tufts University, Sept. 2010- present  
Professor, Dept. of Biochemistry, UMDNJ-Robert Wood Johnson Medical School (formerly Rutgers Medical School), July 1990-Aug. 2010  
Sabbatical, European Bioinformatics Institute, Hinxton, England , Jan. – Dec., 2004  
Associate Professor, Dept. of Biochemistry, UMDNJ-Robert Wood Johnson Medical School, July 1981-July 1990  
Sabbatical, Dept. of Structural Biology, Rosenstiel Basic Medical Research Center, Brandeis University, Waltham, Massachusetts, Sept. 1984-Sept. 1985  
Assistant Professor, Dept. of Biochemistry, UMDNJ-Rutgers Medical School, Sept. 1975-June 1981

**MEMBERSHIPS, OFFICES AND COMMITTEE ASSIGNMENTS IN PROFESSIONAL SOCIETIES:**

Biophysical Society (Member, Council, 1983-85; Member, Executive Council, 1983-85; Representative to FASEB Committee on FASEB Symposia, 1997-2000)  
American Chemical Society  
Protein Society  
American Society of Biochemistry and Molecular Biology  
International Society of Matrix Biology; Member, Council (2011-present)  
Editor, International Society of Matrix Biology Newsletter

**HONORS AND AWARDS:**

Richard Harvey Teaching Award, 2009  
Thomas Alva Edison Patent Award (2006) for patent No 4,971,953 Collagen-based matrices ribose cross-linked.  
Ruth Kirchstein N.I.H. Senior Research Fellowship (2004)  
N.I.H. Senior Research Fellowship (1984-85)  
N.I.H. Research Career Development Award (1976-81)  
Helen Hay Whitney Postdoctoral Fellowship (1972-74)  
N.I.H. Postdoctoral Fellowship (1971-72)  
N.I.H. Predoctoral Fellowship (1967-70)  
UMDNJ Exceptional Merit Award 1980-81; 1982-83.  
AAAS Fellow (elected 2013)

**SERVICE ON NATIONAL GRANT REVIEW PANELS, STUDY SECTIONS, EDITORIAL BOARDS:** Member, N.I.H. Pathobiochemistry Study Section (1991-1995)

Member, Board of Scientific Counselors, National Institute of Child Health and Human Development, NIH (1999-2004)

Member, Site Visit, 1999 and 2003; Laboratory of Cellular and Molecular Biophysics

Chair, Site Visit, 2000, 2004. Laboratory of Integrative and Medical Biophysics, NICHD

Member, Site Visit, 2000, 2004. Laboratory of Physical and Structural Biology

Co-Chair, Site Visit, 2001. Heritable Disorders Branch, NICHD

Member, Site Visit, NICHD, NIH, May, 2009

Member, NIH Shared Instrumentation Study Section, July, 2009

Editorial Board, Journal of Biological Chemistry

**CURRENT GRANT SUPPORT:**

NIH GM 60048, P.I. B. Brodsky, "Structural Studies of Triple-Helical Proteins" (2013-17)

NIH EB011620 Brodsky, B. and Kaplan, D. (multi-P.I.s) "Collagens Biomaterial Applications of Recombinant Bacterial Collagens (2010-2014)

**PUBLICATIONS:**

**Refereed Original Articles in Journals:**

Ramachandran, G.N., Doyle, B. (Brodsky), and Blout, E.R. *Single-chain triple-helical structure*. Biopolymers 6, 1771-1775 (1968).

Doyle, B. (Brodsky), Traub, W., Lorenzi, G.P., Brown, F.R., III, and Blout, E.R. *Synthesis and structural investigations of poly (L-alanyl- L-alanyl- glycine)*. Journal of Molecular Biology 51, 47-59 (1970).

Lorenzi, G.P., Doyle, B. (Brodsky), and Blout, E.R. *Synthesis of polypeptides and oligopeptides with the repeating sequence L-alanyl-L-prolyl-glycine*. Biochemistry 10, 3046-3051 (1971).

Doyle B. (Brodsky), Traub, W., Lorenzi, G.P. and Blout, E.R. *Conformational investigations on the polypeptide and oligopeptides with the repeating sequence L-alanyl-L-prolyl-glycine*. Biochemistry 10, 3052-3060 (1971).

Doyle, B. (Brodsky), Hulmes, D.J.S., Miller, A., Parry, D.A.D., Piez, K.A., and Woodhead-Galloway, J.A. *A D-periodic narrow filament in collagen*. Proceedings of the Royal Society of London B186, 67-74 (1974).

Doyle, B. (Brodsky), Hukins, D.W.L., Hulmes, D.J.S., Miller, A., Rattew, C.J., and Woodhead-Galloway, J. *Origins and implications of the D stagger in collagen*. Biochemical and Biophysical Research Communications 60, 858-865 (1974).

Doyle, B. (Brodsky), Hulmes, D.J.S., Miller, A., Parry, D.A.D., Piez, K.A., and WoodheadGalloway, J. *Axially projected collagen structures*. Proceedings of the Royal Society of London B187, 37-46 (1974).

Doyle, B. (Brodsky), Hukins, D.W.L., Hulmes, D.J.A., Miller, A., and Woodhead-Galloway J. *Collagen polymorphism: Its origin in the amino acid sequence*. Journal of Molecular Biology 91, 79-99 (1975).

Brodsky-Doyle, B., Bendit, E.G., and Blout, E.R. *Infrared spectroscopy of collagen and collagen-like polypeptides*. Biopolymers 14, 937-957 (1975).

Brodsky-Doyle, B. Leonard, K.R., and Reid, K.B.M. *Circular dichroism and electron microscopy studies of human subcomponent Cl<sub>q</sub> before and after limited proteolysis by pepsin*. Biochemical Journal 159, 279-286 (1976).

Hulmes, D.J.S., Miller, A., White, S.W., and Brodsky-Doyle, B. *Meridional synthesis of collagen*. Journal of Molecular Biology 110, 643-666 (1977).

Brodsky, B., Hukins, D.W.L., Hulmes, D.J.S., Miller, A., White, S.W., and Woodhead-Galloway, J. *Low angle X-ray diffraction studies on stained rat tail tendons*. Biochimica Biophysica Acta 535, 25-32 (1978).

Brodsky, B., Eikenberry, E.R, and Cassidy, K. *An unusual collagen periodicity in skin*. Biochimica Biophysica Acta 621, 162-166 (1980).

Eikenberry, E., Brodsky, B., and Cassidy, K. *Does the genetic type of collagen determine fibril structure?* Biophysical Journal 32, 221-222 (1980).

- Cassidy, K., Eikenberry, E., Olsen, B., and Brodsky, B. *X-ray diffraction investigation of collagen fibril structure in dermatosparactic lamb tissues*. *Laboratory Investigations* **43**, 542-546 (1980).
- Eikenberry, E., and Brodsky, B. *X-ray diffraction of reconstituted collagen fibers*. *Journal of Molecular Biology* **144**, 397-404 (1980).
- Brodsky, B., and Eikenberry, E.R. *Characterization of fibrous forms of collagen*. In "Methods of Enzymology, Vol. 82," L. Cunningham and D. Frederiksen. Academic Press, New York (1982), pp. 127-174.
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- Eikenberry, E.F., Childs, B., Sheren, S.B., Parry, D.A.D., Craig, A.S., and Brodsky, B. *Crystalline fibril structure of type II collagen in lamprey notochord sheath*. *Journal of Molecular Biology* **176**, 261-277 (1984).
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#### **Invited Articles (Reviews, Chapters in Books):**

- Miller, A., Brodsky-Doyle, B., Haas, J., Hulmes, D.J.S., Ibel, K., Jenkin, G.J., Timmins, P., and White, S.W. *Neutron scattering by collagen.* Brookhaven Symposium, in *Biol.* 27, III 86-100 (1976).
- Broek, D., Eikenberry, E.F., Fietzek, P.P., and Brodsky, B. *Collagen fibril structure in bone and tendon.* In "The Chemistry and Biology of Mineralized Connective Tissues", ed. A. Veis. Elsevier/North Holland, New York (1981), pp. 79-84.
- Brodsky, B. and Eikenberry, E.F. *Supramolecular collagen assemblies.* *Annals of the New York Academy of Sciences* 460, 73-84 (1985).
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- Baum, J., and Brodsky, B. *Real Time NMR Investigations of Triple-helix Folding and Collagen Folding Diseases.* *Protein Folding and Design* 2, R53-R60 (1997).
- Baum, J. and Brodsky, B. *Folding of Peptide Models of Collagen and Misfolding in Disease.* *Curr. Opin. Struct. Biol.* 2, 122-128 (1999).
- Baum, J. and Brodsky, B. *Folding of the collagen triple-helix and its naturally occurring mutants.* in "Mechanisms of Protein Folding: Frontiers in Molecular Biology", Ed. Pain, R.H., Oxford Univ. Press, Oxford. Pp. 330-351 (2002).

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- Brodsky, B. *Collagen* in McGraw-Hill Encyclopedia of Science & Technology, 9<sup>th</sup> Edition. Vol. 3, pp. 413-414 (2002).
- Brodsky, B. and Ramshaw, J.A.M. *Collagens*. In Wiley Encyclopedia of Molecular Medicine, Ed. T.E. Creighton, John Wiley & Sons, New York. (2002) pp 871-874.
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- Brodsky, B. and Persikov, A.V. Molecular structure of the collagen triple helix. *Adv Protein Chem.* 70, 301-39. (2005)
- Persikov, A.V. and Brodsky, B. (2011) Structural Basis of Collagen Missense Mutations in Matrix Pathobiology (Ed. N. Karamanos). DeGruyter (Berlin). In Press
- Brodsky, B. and Persikov, A. (2013) Structural consequences of Glycine missense mutations in Osteogenesis Imperfecta in *Osteogenesis Imperfecta: A Translational Approach to Brittle Bone Disease* (Ed. J. Shapiro) Elsevier, Academic Press.

### Patents

- Barbara Brodsky, Richard A. Berg, Gad Avigad, Eric Eikenberry, Manoj Jain, Shizuko Tanaka Collagen-based matrices ribose cross-linked. Nov 1990. Patent No 4,971,953
- Persikov, A., Ramshaw, J.A.M. and Brodsky, B. Method for determining thermal stability of collagen or collagen-like peptide. Priority: 3 February 2005  
PCT: US2006/00396, WO/2006/084189
- Mirotnitchenko, O., Inouye, M., Brodsky B. and Ramshaw, J.A.M. Modular triple-helical collagen-like products. Priority: February 2009  
PCT Application: WO 2010/091251 A3

### PRESENTATIONS:

- Invited Seminar, Condensed Matter Physics, Tufts University, October, 2013
- Invited Seminar, Tufts Medical School, April, 2013
- Invited Speaker, American Crystallographic Association, July, 2012
- Keynote Speaker, Collagen Gordon Research Seminar, July, 2011
- Invited talk, University of Bristol, Chemistry, Department, May, 2010
- Invited seminar, Johns Hopkins University, Department of Material Science, March, 2010
- Invited seminar, Temple University School of Medicine, January 2009
- Invited Seminar, Robert Wood Johnson Medical School, Rheumatology Residents and Fellows Seminar Series, September, 2008
- G.N. Ramachandran Lecture, Symposium on Recent Trends in Collagen Research, Chennai, India, 2008
- Invited Speaker, International Osteogenesis Imperfecta Workshop, Annapolis, MD, June 2005
- Invited Speaker, The Johns Hopkins Protein Folding Meeting, St. Michaels, MD, March 2005
- Seminar, the Open University, Milton Keynes, UK, December 2004.
- Seminar, Wellcome Trust Matrix Centre, Manchester, U.K., November, 2004
- Seminar, University of Cambridge, Cambridge, U.K., November, 2004.
- Seminar, European Bioinformatics Institute, March, 2004
- Seminar, City University of New York (Department of Biochemistry and Chemistry), November, 2002
- Seminar, Jefferson Medical College (Dept. of Dermatology and Cutaneous Biology), October, 2001
- Seminar, Biochemistry Department, McMaster University (2001)
- Invited talk at Workshop on Bioactive Peptides (Italy, 2000)
- Seminar, Biochemistry Dept., UMDNJ-NJMS, Newark (1999)
- Seminar, Chemistry Dept., Rutgers University, Newark (1999)
- Talk, Skin Club, New Brunswick (1999)
- Invited Speaker at Don Caspar Festschrift, Quasi-equivalence Conference Florida State University, Tallahassee, FL, January, 1997
- Seminar, University of Kansas Medical Center, Department of Biochemistry, March, 1997
- Speaker, CAMB Symposium on Macromolecular Complexes in Biology and Medicine, October, 1995
- Speaker, Hirschmann Award Symposium in honor of Harold Scheraga, January, 1999



