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Jasna Brujić

Positions

2007- **Center for Soft Matter Research**, **New York University, U. S. A.**
Assistant Professor

2004 – 2007 **Columbia University, New York, U.S.A.**
Post-Doctoral Research Scientist (Julio Fernandez Lab)

Education

2000 – 2003 **University of Cambridge, Gonville and Caius College, Cavendish Laboratory, Department of Physics, U.K.**
Ph.D. Degree
Experimental Study of Stress Transmission Through Particulate Matter.

1996 - 2000 **Imperial College of Science, Technology & Medicine, London**
MSci (Hons) Chemistry with a Year Abroad (France), (3+1 years).
Degree Result: 1st Class Honours

1999 - 2000 **Final Year at the Ecole Supérieure de Physique et de Chimie Industrielles (ESPCI), Paris, France**
Diffusing Wave Spectroscopy Investigation of the Dynamics of Latex Beads Suspended in a Hydrogel Matrix.

Awards / Grants

2008 **Materials Research Science and Engineering Center (MRSEC) for Semantophoretic Assemblies at NYU: co-PI.**

2008 – 2009 **Whitehead Fellowship for Junior Faculty in Biomedical and Biological Sciences**, *Protein Folding at the Single Molecule Level*.

2009 – 2010 **NYU-Poly Seed Grants**, *Effect of Fluorination on Protein Stability*.

2006 – 2011 **Burroughs Wellcome Fellowship:Career Award at the Scientific Interface,** *Mechanical Networks in Biology: Proteins to Cells.*

2010 – 2015 **Career Award from the National Science Foundation,** *Microstructure of Jammed Particulate Matter.*

Relevant Work Experience

2006-2009 **Oxford University Press,** UK
French to English translator of physics books entitled:
"Primordial Cosmology", by Jean-Phillipe Uzan and Peter Patrick.

2003-2004 *"New Visions on Form and Growth - Digitation, Dendrites and Flames",* by Pierre Pelcé*,* published November 2004.

Summer 2002 **Schlumberger Doll Research**, Connecticut, U. S. A.
Student internship project (3 months): *Experimental Study of Granular Dynamics.*

Refereed Journal Publications

1) N. Biais, D. L. Higashi, ***J. Brujić***, M. So, M.P. Sheetz, *Force Dependent Polymorphism in Type IV Pili reveals Hidden Epitopes*, **PNAS**, 107, 25, 11358-11363 (2010).

2) E. I. Corwin, M. Clusel, A. Siemens, ***J. Brujić*****,** *A model of random packing of polydisperse frictionless spheres*, **Soft Matter**, 6, 2949-2959 (2010).

3) M. Clusel, E. I. Corwin, A. Siemens, ***J. Brujić*****,** *A `granocentric' model of random packing of jammed emulsions*, **Nature**, 460, 611-615 (2009).

4) S. Garcia-Manyes, L.dougan, C. L. Badilla-Fernandez **,** ***J. Brujić***, J. M. Fernandez, *Direct observation of an ensemble of stable collapsed states in the mechanical folding of ubiquitin*, **PNAS**, 106, 26, 10534-10539 (2009).

5) L.dougan, ***J. Brujić***, J. M. Fernandez, *Forceclamp spectroscopy of single proteins* in *Single Molecule Dynamics in Life Sciences*, edited by T. Yanagida and Y. Ishii, **Wiley-VCH**, Weinheim (2008).

6) S. Garcia-Manyes, ***J. Brujić****,* C. L. Badilla-Fernandez, J. M. Fernandez, *Force-clamp spectroscopy of single protein monomers reveals the individual unfolding and refolding pathways of I27 and ubiquitin,* **Biophys. J.,** 93, 7, 2436-2446 (2007).

7) ***J. Brujić***, C. Song, P. Wang, C. Briscoe, G. Marty, H. A. Makse, *Measuring the Coordination Number and Entropy of a 3D Jammed Emulsion Packing by Confocal Microscopy*, **Phys. Rev. Lett.,** 98, 248001 (2007).

8) ***J. Brujić***, R. Hermans, S. Garcia, K. A. Walther, J. M. Fernandez, *Dwell-time distribution analysis of polyprotein unfolding using `Force-Clamp' Spectroscopy*, **Biophys. J.**, 92, 8, 2896-2903, (2007).

9) Sri R. A. Koti*, ***J. Brujić****,* H. Huang, A. P. Wiita, H. Lu, L. Li, K. A. Walther, M. Carrion-Vazquez, H. Li, J. M. Fernandez, *Contour length and refolding rate of a small protein controlled by engineered disulfide bonds*, **Biophys. J.,** 90, 225-233, (2007).

10) ***J. Brujić***, R. Hermans, K. A. Walther, J. M. Fernandez, *Single molecule force spectroscopy reveals signatures of glassy dynamics in the energy landscape of ubiquitin,* **Nature Physics**, 2, 282-286 (2006).

11) K. A. Walther, ***J. Brujić***, H. Li, J. M. Fernandez, *Sub-Angstrom conformational changes of a single molecule captured by AFM variance analysis,* **Biophys. J.,** 90, 10, 3806-3812, (2006).

12) ***J. Brujić***, D. Johnson, O. Sindt, H. A. Makse, *Granular Dynamics in Compaction and Stress Relaxation,* **Phys. Rev. Lett.**, 95, 12, 128001 (2005).

13) ***J. Brujić*** and J. M. Fernandez, *Technical Comment Reply on "Entropic Elasticity Masks Protein Folding in AFM Experiments"*, **Science** 308, 498c (2005).

14) J. M. Fernandez, H. Li, ***J. Brujić***, *Technical Comment Reply on "Force-Clamp Spectroscopy Monitors the Folding Trajectory of a Single Protein",* **Science** 306, 411c (2004).

15) S. F. Edwards, ***J. Brujić***, H. A. Makse, *A Basis for the Statistical Mechanics of Granular Systems*, in **Unifying Concepts of Granular Media and Glasses**, edited by A. Coniglio, A. Fiero, H. J. Herrmann and M. Nicodemi, Elsevier, Amsterdam (2004).

16) H. A. Makse, ***J. Brujić***, S. F. Edwards, *Statistical Mechanics of Jammed Matter,* in **The Physics of Granular Media***,* edited by H. Hinrichsen and D. E. Wolf, Wiley-VCH (2004).

17) ***J. Brujić***, S. F. Edwards, D. V. Grinev, I. Hopkinson, D. Brujić, H. A. Makse, *3D Bulk Measurements of the Force Distribution in a Compressed Emulsion System,* **Faraday Disc.** 123, 207-220 (2003).

18) ***J. Brujić***, S. F. Edwards, I. Hopkinson, and H. A. Makse , *Characterisation of the Measuring the Distribution of Interdroplet Forces in a Compressed Emulsion System,* **Physica A** 327, 201-212 (2003).

19) ***J. Brujić***, D. V. Grinev, S. F. Edwards, *Jammed Systems in Slow Flow Need a New Statistical Mechanics,* **Proc. Roy. Soc. A** 361, 741 (2003).

20) S. F. Edwards, D. V. Grinev, ***J. Brujić***, *Fundamental Problems in Statistical Physics of Jammed Packings*, **Physica A** 330, 61 (2003).

Conference Presentations

1) *Non-exponential kinetics may increase the robustness of mechanically active proteins,* **Gordon Research Conf.: Biopolymers,** Salve Regina, Newport, July 2010. (invited talk)

2) *Single molecule force spectroscopy reveals hidden complexities in the structure and dynamics of proteins,* **Gordon Research Conf.: Single Molecule Approaches to Biology,** Il Ciocco, Lucca, Italy, June 2010. (invited talk)

3) *AFM force spectroscopy reveals complex dynamics of single protein molecules,* **3rd AFM Biomed Conference**, Red Island, Croatia, May 2010. (invited talk)

4) *Turning random packing inside out,* **PARDIM: Does dimensionality matter?**, Max Planck Institute, Dresden, Germany, June 2010. (invited talk)

5) *Molecular architecture governs the kinetics of single molecule unfolding under force,* **APS Meeting**, Portland, Oregon, March 2010. (invited talk given by postdoc Eric Corwin)

6) *Random close packing of polydisperse jammed emulsions,* **APS Meeting**, Portland, Oregon, March 2010. (invited talk)

7) *A local statistical model captures the random packing of polydisperse emulsions,* **Mini Stat-mech Meeting**, Berkeley, January 2010.

8) *Random close packing in polydisperse jammed emulsions,* **Physics Colloquium**, Emory University, Atlanta, Georgia, December 2009.

9) *Force-clamp technique for accurate recording of single protein folding kinetics,* **Topics in protein folding**, University of Maryland, Washington, November 2009.

10) *Random close packing of polydisperse emulsion droplets,* Nationaly University of Singapore, Singapore, November 2009.

11) *Granocentric model for random packing of emulsions,* **New York Nanoscience Discussion Group meeting**, NYU, October 2009.

12) *A granocentric view of random packing: experiments and theory*, **6th International Discussion Meeting on Relaxations in Complex Systems**, Italy, Rome, August 2009.

13) *Unexpected scaling laws in the mechanical unfolding of single protein molecules***, European Biophysics Congress**, Italy, Genoa, July 2009.

14) *Kinetics of single molecule protein unfolding under a stretching force reveals hidden complexities*, **Molecular Kinetics** , Germany, Berlin, May 2009.

15) *Torturing single molecules to get their secrets out*, CCNY, NY, March 2009. (colloquium)

16) *Unexpected scaling laws in the mechanical unfolding of proteins,* **Trends in Nanoscience**, Germany, Irsee, March 2009. (invited talk)

17) *Physics of proteins from single molecule experiments,* University of Pennsylvania, October 2008. (invited seminar)

18) *What determines the structure of packings?,* Exxon-Mobil Research Labs, New Jersey, September 2008. (invited seminar)

19) *Revisiting protein folding at the single molecule level,* Yale University, New Haven, September 2008. (invited seminar)

20) *Force dependent unfolding of ubiquitin with force-clamp spectroscopy,* **Computational Protein Structure and Mechanics**, Fudan University, Shanghai, September 2008.

21) *Single molecule force spectroscopy,* **International Workshop on Current Problems in Soft Condensed Matter**, KAIST, S. Korea, September, 2008. (invited lecture)

22) *Single molecule force spectroscopy,* **International School of Biophysics Antonio Barsellino, 36th Course: Multidimensional optical fluorescence microscopy towards nanoscopy**, Erice, Sicily, April 2008. (invited lecture)

23) *What can we learn from pulling single molecules?,* **34th New England Complex Fluids Workgroup,** Yale University, March 2008. (invited talk)

24) *Statistical features of the rough energy landscape of proteins emerging from single molecule force-clamp spectroscopy*, **APS meeting**, New Orleans, March 2008.

25) *Influence of the microstructure on jammed packings of spheres*, **American Physical Society**, New Orleans, March 2008. (contributed talk)

26) *Conformational dynamics of protein folding captured by single molecule experiments,* **Amsterdam-New Amsterdam Soft Matter Meeting**, Science Museum in Amsterdam, December 2007. (invited talk)

27) *Deviations from the two-state model for protein folding from single molecule force spectroscopy experiments*, Harvard School of Public Health, October 2007. (MIPS Seminar)

28) *Glassiness of single protein molecules*, Group of Christof Schuette, Freie Universitat Berlin, September 2007. (Invited colloquium)

29) *Single molecule protein folding experiments under force reveal a glassy energy landscape*, **6th European Biophysics Congress**, Imperial College London, July 2007. (`New and Notable talk')

30) *Torturing single protein molecules using force-clamp spectroscopy,* **Genomes to Systems**, **6th Annual Symposium of the Center for Comparative Functional Genomics**, New York University, May 2007.

31) *Contour length and refolding rate of a small protein controlled by engineered disulfide bonds,* **51st Biophysical Society Annual Meeting,** Baltimore, Maryland, March 2007.

32) *Force-clamp spectroscopy of single protein monomers reveals the individual unfolding and refolding pathways of I27 and ubiquitin,* **51st Biophysical Society Annual Meeting,** Baltimore, Maryland, March 2007. (poster)

33) *Is there a statistical mechanics of static sand piles?,* **96th Statistical Mechanics Conference,** Rutgers, New Brunswick, NJ, December 2006. (panel by Michael Fisher)

34) *Glimpses of the protein folding landscape from AFM force spectroscopy experiments,* **Amsterdam-New Amsterdam Workshop**, New York Academy of Sciences, New York, November 2006. (invited talk)

35) *Force-clamp AFM spectroscopy of single proteins,* **Nanobiophysics**, Szeged, Hungary, September 2006. (invited talk)

36) *Coordination number distribution in colloidal suspensions and emulsions*, **4th Annual Northeastern Granular Workshop,** Benjamin Levich Institute, City College of New York, June 2006. (invited talk)

37) *Binomial distribution of dwell times of an unfolding protein*, **Frontiers in Chemical Biology: Single Molecules,** Cambridge, U.K., March 2006. (poster)

38) *Fluctuations in the energy landscape of ubiqitin revealed by single molecule measurements*, **50th Biophysical Society Annual Meeting,** Salt Lake City, Utah, February 2006. (oral presentation)

39) *Single molecule AFM spectroscopy*, **Bioinspired Nanoscience and Molecular Machines,** Bariloche, Argentina, March 2005. ***Full Travel Grant***. (workshop lecture).

40) *Markovian Kinetics Behavior of the Forced Unfolding of Polyubiquitin Chains,* **49th Biophysical Society Annual Meeting**, Long Beach, California, February 2005. (poster)

41) *Novel experiments lead to statistical measurements of jamming*, International Conf. on Statistical Physics (**Statphys 22**), Bangalore, India, July 2004. ***Full Travel Grant***. (oral presentation)

42) *Measurements of the Force Distribution in a Compressed Emulsion*, **Granular and Particle-Laden Flows**, Isaac Newton Institute, Cambridge, UK, September 2003. (oral presentation)

43) *Force Distribution Parallels between Colloidal and Granular Packings*, **Unifying Concepts in Granular Media and Glasses**, Capri, Italy, June 2003. (oral presentation)

44) *Jammed Systems in Slow Flow Need a New Statistical Mechanics,* **Slow Dynamics in Soft Matter**, The Royal Society, London, UK, September 2002. (oral presentation)

45) *3D Bulk Measurements of the Force Distribution in a Compressed Emulsion System,* **Faraday Discussion Meeting**, University of Edinburgh, UK, September 2002.

46) *Microrheology of Highly Concentrated Emulsions,* **Complex Fluids in External Fields**, Manchester, UK, August 2001. (poster)

47) *Confocal Microscopy of Emulsions Under Flow,* International Conf. on Statistical Physics (**Statphys 21**), Cancun, Mexico, June 2001. (poster)