CURRICULUM VITAE

Arnd Pralle, Ph.D.

University address
239 Fronczak Hall
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Education

Physics, M.S. Justus-Liebig-University, Giessen, Germany 1994
"Magnetic force microscopy on paramagnetic surfaces"

Physics, Ph.D. European Molecular Biology Lab, Heidelberg 1999
Ludwig-Maximilians-University, Munich
"Physical properties of the plasma membrane studied by local probe techniques"

Employment

2006-	Assistant Professor, Dept. of Physics, University at Buffalo, SUNY
2006-	Adjunct Assistant Professor, Dept. of Biophysics and Physiology, University at Buffalo, SUNY
2004-2006	Associate Specialist, University of California Berkeley, CA
2000-2003	Postdoctoral Fellow, University of California Berkeley, CA
1999-2000	Postdoctoral Fellow, Max-Plank-Inst. Mol. Cell Biology and Genetics, Dresden

Awards and Honors

- Recipient, DAAD (German Academic Exchange) fellowship, 1991.
- Recipient, Heraeus Award in recognition of outstanding master thesis, 1994.
- EMBL (European Molecular Biology Lab) predoctoral fellowship, 1994-1999.
- Johns Hopkins University - Neuroscience Graduate student fellowship (declined), 1994.
- Recipient, Worthington Travel Award and ASCB predoctoral Travel Award, 1998.
- EMBO (European Molecular Biology Organization) long-term fellow, 2000-02.
- Recipient, Schloessmann Award (Max-Plank-Symposium), 2001.
- HFSP (Human Frontier Science Program) long-term fellow, 2001-05.
- Recipient, Individual Development Award United Univ. Professions, 2010.
- Recipient, EUREKA award, National Institutes of Health (NIH), 2011-15.
- HFSP (Human Frontier Science Program) research award, 2012-15.

Professional Membership and Activities

Grant Reviewer:

- National Science Foundation (NSF) reviewer (*ad hoc*) (2006-09)
- European Research Foundation reviewer (*ad hoc*) (2008-11)
- Common Wealth Fund UK reviewer (*ad hoc*) (2008-11)
- National Institute of Health (NIH) (*mail reviewer*) (2012)
- Israeli Ministry of Science and Technology (*mail reviewer*) (2012)

Journal Peer Reviewer:

Nature - Nature Methods - Nature Photonics - ACS Nanoletters (Ed: P. Alivisatos) - ACS Nano (Ed: W. Parak) - Neuron - J. Amer. Chem. Soc. - Proc. Nat. Acad. Sciences (Ed.: H. Yang) - Biophys. J. (Ed.: A. Kusumi; P. Schwille) - J. Gen. Physiology.

Academic Organizations

- Member of the Amer. Soc. of Cell Biologist (ASCB) and the Amer. Biophysical Soc. (1995-), the Amer. Chem. Soc. (ACS), Amer. Phys. Society (APS) and Soc. for Neuroscience (SfN);
- Elected representative of the graduate student body at EMBL, curriculum committee and co-organizer of student symposia at EMBL (1995-97)
- Judge at student poster competition for the Biophysics Society 2009

National Advising

- Participant in National Science Foundation Workshop on the future communication between wireless networks and biological material, Washington, D.C. (7/2011)

University Services

- Elected faculty senator at UB (2008-2012)
- University-CATs review committee (2010)
- Co-organizer of INS workshop "Nanotechnology for Biology and Medicine" (2009)
- Grant review panel for IRDF (2008)
- Initiator and organizer of the Biophysics Evening Discussions (2007-09), which was a monthly inter-departmental, inter-campus meeting of researcher interested in Biophysics subjects

College Services

- Faculty Co-Director of UB Imaging Facility (since 2010)
- Planning and MRI funding application for microscopy center for North campus (2008-09)
- Organizer "UB Microscopy User Workshop 2012"

Departmental Services

- **Science and Art Exhibit Committee** (2009 – 2010)
- **CAMBI fellowship committee** (2007-2012)
- **Teaching Assignment Committee** (2008 – 2010)
- **Advisory Committee to the Chair** (2008 – 10)
- **Outstanding Teaching Assistant Awards Committee** (2009-2010);
- **Graduate Student Recruitment Committee** (2006 – 2012);
- **Outreach and recruitment committee** (2008 – 2012)
  activities: OpenHouse Spring and Fall 2007/ 2008, in 2008 organized science photo competition, designed and mailed recruitment poster worldwide; 2010 presented UB physics at grad fair at local colleges
- **Qualifying Examination Committee** (2006 – 2012)
- **Graduate Studies Committee** (2007 – 2008)
- **Colloquium Committee** (Spring 2008 (Chair); Fall 2010, Spring 2012 (Chair))
- **Seminar Committee** (Fall 2007, Spring 2011; Fall 2012 (Chair)).

Community Services

- **Science Cabaret at Hallwalls** – an evening of science and art in a bar; I participated 4/4/10, organized "*Illuminating Nano*" on 11/3/10 with presentations and hands-on experiments on nanoparticles, light and art
- **UB Open-House** (2008 - 2012) – each semester we open our labs for a Saturday for the general public
- **STEP** (2008 - 2010) - outreach day in local high schools

Courses Taught at University at Buffalo SUNY

- PHY101 / 102 – College Physics 1 /2
  Since arriving at UB in 2006, I have every year been part of this is a large (850 students / 3 sessions) general physics course. The challenge lies in covering the immense amount of material (all of physics in one year) while handling the large number of very diverse students and providing them what they individual need.
- PHY307 – Modern Physics Laboratory
  I have organized and taught this lab for the last four years. Typical 20 students take this course and perform in teams of two the experiments testing modern physics (mostly quantum mechanics).
- PHY407/551 – Advanced Physics Laboratory
  This course is team taught by the experimental faculty of the physics department, and offers the students the experience to work in a team of two on 2-3 experiments per semester, each for one month. I have been teaching Faraday Rotation and recently set up an optical trapping experiment.
- BPH 400 : Biological Physics
  This mixed upper division undergraduate / graduate level introductory class of biophysics is taught together with colleagues from the Departments of Physics and of Biophysics and Physiology. It focuses on physical principles in biology and the development of physical methods to study biological system.
- BPH510 –Modeling & Systems Theoretical Biophysics
  I participated for several years in this graduate level class in quantitative biology held together with colleagues from the Department of Biophysics and Physiology, covering among others, diffusion, cable theory, protein folding and forced unfolding.
- PHY533 – Introduction to Biophysics - Methods
  Spring 2011, I taught a first year graduate level Biophysics course, highlighting modern cellular and single molecule level biophysics research and methods. I had developed this course new (s. below)
- PHY582 –Biophysics Bootcamp
  During the summer break, I organized and taught a bootcamp in biophysics. As this is a newly developed course, it's described below.

Course Improvements

- PHY101 / 102 – College Physics 1 /2
  In 2006 – 2008, my colleagues Drs. Luo and Ganapathy and I modernized the teaching approach by including clickers for in class quizzes and Just-in-time-teaching with pre-class readings and quizzes. In 2011 I overhauled some of the in-class demonstration and created video content for these.
- PHY307 – Modern Physics Laboratory
  Over the years, I updated this lab course, by restructuring half of the experiments to remove tedious repetitions and computerized large parts of the data acquisition. The gained time is now spent of pre-lab oral quizzes and discussions with the students, and I was able to include 3 new modern physics experiments: Compton Effect, Millikan and Nanoparticle Spectroscopy.

New Course Development

- PHY533 – Introduction to Biophysics
  I developed and taught this graduate / undergraduate cross-listed course in spring 2011. It follows the text book by Rob Philipps "Physical Biology of the Cell". I combined lecture with student presentations and multi-day lab sessions to cover the essential biophysics techniques and ideas.
- PHY582 – Biophysics Bootcamp
  To be able to introduce graduate students to experimental techniques used in Biophysics, I organized a 10-day boot camp (daily from 9am-6pm) with morning lecture, afternoon experiments and evening presentations.
- Biophysics lab component to Professional Science Masters
  As CoPI on a Sloan Grant (PI: B.Pitman) I developed three experiment to from an undergraduate senior lab to introduce to biophysical research work.

Courses Taught outside of University at Buffalo SUNY

- Lecturer on INSERM course on membrane proteins and dynamics (2002)
- Lecturer and instructor for Marine Biology Lab(Woodshole) advanced microscopy course (2007)
- Instructor Adv. Imaging Methods, UC Berkeley (2005-10 and 2012)

Research Supervision

Research advisor to **15** undergraduate students:

- **John Fee** (Premed, 2007), currently: residency after graduating MD from medical school
- **Meher Singh** (Math, 2007)
- **Monica Zugravu** (Biophysics, 2007-08, ***Honors thesis***) currently: graduate student in Bioengineering
- **Teresa Rizzone** (Prepharm, 2007-08), currently: Pharmacist at VA after graduating PharmD from UB
- **Joe Bodnarchuk** (Physics, 2008)
- **Melissa Critches** (Biomed. Eng., 2008)
- **Esther Jung** (Bioeng., 2008 -09)
- **Samantha Caster (**Biophysics, 2009)
- **Justin Porter** (Summer student from Johns Hopkins, 2009)
- **Henry Kayutkin** (UB, 2010)
- **Dan Stoloff** (Physics, 2010-11), currently: physics graduate student at North Eastern U.
- **Rebekah Testa** (Psychiatry, 2010-11), currently: Physician Assist. grad. student at D'Youville C.
- **Katherine Spoth** (Physics, 2011-12, ***Honors thesis***), currently: physics graduate student at Cornell
- **Junhong Choi** (Physics, 2012-13, ***Honors thesis***)
- **Zach van Zant** (Physics, 2012-13, ***Honors thesis***)

Research advisor to **7** graduate students:

- **Yunshiang Hsu** (Ph.D., 2006 - 2012 (thesis defense 12/10/12))
- **Yichen Li** (M.S., 2006 - 2008), completed high energy Ph.D. at UT and currently Postdoc at LNL
- **Heng Huang (**Ph.D., 2007 - 2012 (thesis defense 10/01/12))
- **Vijay Rana** (M.S., 2008 - 2010), currently graduate student in Medical Physics
- **Muhammed Simsek** (Ph.D., 2009 -)
- **Maral Alyari** (Ph.D., 2012 -)
- **Jin Weixiang** (Ph.D., 2012 -)

Thesis committee member for **10** graduate students:

- **Joseph Knab** (Ph.D., 2007, Dr. Markelz)
- **Yunfen He** (Ph.D., 2009, Dr. Markelz)
- **Ferdinand Lipps** (M.S., 2007, Dr. Markelz)
- **Evan Zynda** (Ph.D., Dr. Repasky, 2005 - 10)
- **Sandesh Gupta** (Ph.D., Dr. Prasad, 2006 - 11)
- **Weiming Peng** (M.S., 2011, Dr. Kharchilava)
- **Atcha Kopwitthaya** (Ph.D., Dr. Prasad, 2007 - 12)
- **Jeffrey Hafner** (Ph.D., Dr. Zheng, 2008 - 12)
- **Mustafa Tekpinar** (Ph.D., Dr. Zheng, 2008 - 12)
- **Srirupa Chakraborty** (Ph.D., Dr. Zheng, 2010

Publications

Peer-reviewed Publications

- Web of Science 20 publications with a total of **1,900** citations and an average of 95 cit./publ.; **12** publ. > **50** citations; **6** publ. > **100** citations, h-factor = 14
- Google Scholar: total **2,294**.; **12** publ. > **50**.; **8** publ. > **100**, h-index = 14; i-index 16
- **8** in ***highly selective*** *journals* with impact factor 10 or higher
- University at Buffalo graduate student authors underlined

1. Florin, E.-L., **Pralle, A.**, Hörber, J.K.H., and Stelzer, E.H.K. (1997) Photonic force microscopy based on optical tweezers and two-photon excitation for biological applications. **J. Struct. Biol.***119*, 202-211. [**80**]
2. Langer, Oeffner, Wittman, Flosser, Schaar, Haberle, **Pralle,** Rupperberg, and Hörber. (1998) A scanning force microscope for simultaneous force and patch-clamp measurements on living cell tissues. **Rev. of Sci. Inst.** *68*, 2583-2590. [**20 cit.**]
3. **Pralle, A.**, Florin, E.-L., Stelzer, E.H.K., and Hörber, J.K.H. (1998) Local viscosity probed by photonic force microscopy. **Appl. Phys. A** *66*, S71-S73. [**55 cit.**]
4. Florin, E.-L., **Pralle, A.**, Stelzer, E.H.K., and Hörber, J.K.H. (1998) Photonic force microscope calibration by thermal noise analysis. **Appl. Phys. A** *66*, S75-S78. [**65 cit.**]
5. **Pralle, A.**, Prummer, M., Florin, E.-L., Stelzer, E.H.K., Hörber, J.K.H. (1999) Three-dimensional high resolution particle tracking for optical tweezers by forward light scattering. **Microsc. Res. Tech.** *44*, 378-386. **[167 cit.]**
6. **Pralle, A.**, Keller, P., Florin, E.-L, Simons, K., and Hörber, J.K.H. (2000) Sphingolipid-cholesterol rafts diffuse as small entities in the plasma membrane of mammalian cells. **J. Cell Biol**. *148*, 997-1007. **[609 cit.]** (***highly selective journal***)
7. Jahraus, A., Egeberg, M., Hinner, B., Habermann, A., Sackmann, E. **Pralle, A.**, Faulstich, H., Rubin, V., Defacque, H., and Griffith, G. (2001) ATP-dependent membrane assembly of F-actin facilitates membrane fusion. **Mol. Biol. Cell** *12*, 155–170. **[71 cit.]**
8. **Pralle, A.**, and Florin, E.L. (2002) Cellular membranes studied by photonic force microscopy**. In Meth. In Cell Biology** *68*, 193-212. **[13 cit.]**

9. Gandhi, C.S., Clark, E., Loots, E., **Pralle, A.**, and Isacoff, E.Y. (2003) The orientation and molecular movement of a K^+ channel voltage-sensing domain. **Neuron** *40*, 515-525. **[82 cit.]** (***highly selective journal***)

10. Tischer, C., **Pralle, A.**, and Florin, E.L. (2004) Determination and correction of position detection nonlinearity in single particle tracking and three-dimensional scanning probe microscopy. **Microscopy & Microanalysis**. *10*, 425-434. **[3 cit.]**

11. Chang, M.C., **Pralle, A.**, Isacoff, E.Y., and Chang, C. (2004) A selective, cell-permeable optical probe for hydrogen peroxide in living cells. **J. Am. Chem. Soc.** *126*, 15392-15393. [**147 cit.**] (***highly selective journal***)

12. Cohen, B., **Pralle, A.**, Yao, X.J., Swaminath, G., Gandhi, C.S. Jan, Y.N., Kobilka, B.K., Isacoff, E.Y., and Jan, L.Y. (2005) A fluorescent probe designed for studying protein conformational change. **Proc. Nat. Acad. Sciences** *102 (4)*, 965-970. [**52 cit.**] (***highly selective journal***)

13. Miller, W.E., Albers, A.E. **Pralle, A.**, Isacoff, E.Y., and Chang, C. (2005) Boronate-based fluorescent probes for imaging cellular hydrogen peroxide. ***J. Am. Chem. Soc.*** *127*, 16652-16659. [**110 cit.**] (***highly selective journal***)

14. Zeng, L., Miller, W.E., **Pralle, A.**, Isacoff, E.Y., and Chang, C. (2006) A Selective Turn-On Fluorescent Sensor for Imaging Copper in Living Cells. ***J. Am. Chem. Soc.*** *128*, 10-11. [**247 cit.**] (***highly selective journal***)

15. Kalab*, P., **Pralle*, A.**, Isacoff, E., Heald, R., and Weis, K. (2006) Analysis of a RanGTP-regulated gradient essential for mitosis in somatic cells. ***Nature*** *440*, 697-701, ***equal contribution**. [**145 cit.**] (***highly selective journal***)

16. Kalab, P. and **Pralle, A**. (2008) Quantitative Fluorescence Lifetime Imaging in Cells as a Tool to Design Computational Models of Ran-Regulated Reaction Networks. ***Meth. Cell Biol.*** *89*, 541-547 [**4 cit.**]

17. Huang, H., Delikanli, S., Zeng, H, Ferkey, D. and **Pralle, A.** (2010) Remote control of ion channels and neurons through magnetic-field heating of nanoparticles. ***Nature Nanotech.*** *5,* 602-606 [**28 cit.**] (***highly selective journal***)

    Our work was highlighted by a News & Views article (*Nature nanotechnology* 5(8):560-561.) and many popular science magazines, among them Chemistry World, New Scientist, Popular Science, Discovery Magazine, Scientific American, and NovaPlus.

18. Jin, L., Baker, B., Mealer R., Cohen, L., Pieribone, V., **Pralle, A.** and Hughes, T. (2011) Random insertion of split-cans of the fluorescent protein venus into Shaker channels yields voltage sensitive probes with improved membrane localization in mammalian cells. ***J. Neurosci. Meth.*** *199* (1), 1-9 [**1 cit.**]

19. Lim, K.H., Huang, H., **Pralle, A.,** and Park, S. (2011) Engineered Streptavidin Monomer and Dimer with Improved Stability and Function. ***Biochemistry*** *50* (40), 8682-8691 [**1 cit.**]

20. Lim, K.H., Huang, H., **Pralle, A.,** and Park, S. (2012) Stable, high-affinity streptavidin monomer for protein labeling and monovalent biotin detection. ***Biotechnology and Bioengineering***, in press.

21. Huang, H., Simsek, M., and **Pralle, A.** (2012) Continuous monitoring of membrane protein micro-domain association during cell signaling. *Resubmitted to Proc. Nat. Acad. Sciences*. (ePub 2011, **Physics ArXiv:1101.5087**)

22. Hsu, Y. and **Pralle, A.** (2012) In-situ linearization of position detector for high resolution diffusion studies in optical traps. *Submitted to Optics Express*.

23. Zynda, E., Grimm, M.J., Yuan, M., Zhong, L., Mace, T.A., Capitano, M., Ostberg, J.R., Lee, K.P., **Pralle*, A.**, and Repasky*, E. (2012) Thermal Microenvironment Provides a New Level of Regulation of T Cell Activation. *Submitted to PLOS Biology*. *corresponding authors

Publications in preparation

24. Hsu, Y. and **Pralle, A.** (2012) Thermal Noise Imaging reveals cholesterol stabilized nanodomains which are stiffer, concentrate GPI-anchored proteins and form along the cytoskeleton. *In preparation*.

25. Huang, H., King-Lyons, N., Connell, T.D., and **Pralle, A.** (2012) The enterotoxin LTIIb modulates immunogenicity of B-cells by altering the stability of cholesterol nanodomains. *In preparation*.

Patents and New Technology Disclosures

1. Huang, H., and Pralle, A. "Remote magnetic cell stimulation using nanoparticle heating" New Technology Disclosure (2009).
2. Huang, H., and Pralle, A. "Imaging FCS to determine membrane protein lipid domains association in vivo" New Technology Disclosure R-6506 (2010); Provisional US Patent Application 61/444,404 (2011) and US Patent Application pending (2012)

   Method to measure the protein lipid raft association in real time in intact cells, making measurements of the effects of of cholesterol amounts on membrane structure possible, and the basis for a possible new cholesterol test.
3. Connell, T.D., Pralle, A., and Masso-Welch, P. "LT-II toxins specifically target breast-cancer cells and drive them into apoptosis" New Technology Disclosure (2012).

Presentations

Invited Colloquia

(Since fall 2006)

- "Lipid rafts studied by thermal noise imaging" Biology colloquium. *UB Biology (Oct 2006).*
- "Lipid rafts structure and function by thermal noise imaging" Cell Biology and Immunology Colloquium. *Roswell Park Research Inst. (Nov. 2006)*
- "Cell membrane structures studied by thermal noise imaging" Physics colloquium. *U. Memphis (April 2007).*
- "Laser trapping to determine structure function" INS Symposium on Nanotechnology. *UB Engineering (May 2007).*
- "FLIM based FRET quantification of a RanGTP-regulated gradient essential for mitosis in somatic cells." Physics colloquium. *Center for Nonlinear Dynamics, UT Austin,* (host: E.L.Florin, April 2008).
- "Cell membrane structure and proteins signaling studied by membrane protein diffusion. " Biophysics Colloquium, *Cornell University,* (hosts: B.A.Baird and M.Wang, Nov. 2009).
- Physics Colloquium, *UB (12/01/10).*
- "Remote stimulation of C. elegans and neuronal cells using RF magnetic fields and nanoparticles." Electrical Eng. Seminar Colloquium, *UB (12/02/10).*
- "Remote stimulation of proteins, neurons and worms." Biophysics Colloquium, *UB (04/07/11).*
- "Remote stimulation of proteins, neurons and worms." Colloquium*, Wright State University, Dayton* (host: S.M.Hussain, *05/05/11).*

- "Magnetogenetics: remote stimulation of neurons with RF magnetic fields and nanoparticles." Colloquium, *Research Institute of Molecular Pathology (IMP), Vienna, Austria (02/27/11).*
- "Cell Membrane Nanodomains characterized by binned-imaging FCS and thermal noise imaging." Colloquium, *Max Planck Institute for Biophysical Chemistry, Göttingen, Germany* (hosts: S.Techert and S.W.Hell, 03/24/11).
- "Cell Membrane Nanodomains explored with binned-imaging FCS and thermal noise imaging." CPLC Colloquium. *U. of Illinois at Urbana-Champaign* (host: T.Ha, 04/06/12).
- "Cell Membrane Ultra-structure and function: Cholesterol Nanodomains" Physical Chemistry Seminar. *U. Penn* (host: T.Baumgart, 11/15/12).
- "Cell Membrane Ultra-structure and function: Cholesterol Nanodomains" Biophysics Colloquium. *U. of Michigan* (host: S.Veatch, 11/29/12).

(Prior to summer 2006)

- Cellular membranes studied by photonic force microscopy. *Yokohama and Nagoya. (2000).*
- Towards a photophysical model of fluorescence changes reporting protein rearrangements in a voltage gated potassium channel. *3rd Ann. HFSP fellows symposium. Cambridge, UK (2003).*
- Protein interactions, protein conformations and membrane structures studied by modern light microscopy and optical trapping. *UB Physics (Jan 2006), U Mass Amherst (Feb 2006), U. Connecticut (Feb 2006), The Vollum Inst. (March 2006), U of Goettingen (March 2006), U of Leipzig (Apr. 2006), and EPFL Lausanne (Apr 2006)*
- Protein interactions, protein conformations and membrane structures studied by modern light microscopy and optical trapping. *U. California Irvine (8/ 2005) and Purdue U. (May 2005).*

<u>Invited</u> Conference Speaker

(Since fall 2006)

- "Magnetic nanoparticle based RF field stimulation of neurons." 6th Advanced Optical Methods Workshop. *UC Berkeley, invited (January 2009).*
- "Remote stimulation of neuronal cells using RF magnetic fields and nanoparticles." **Invited Plenary speake**r, InterMAG 2011*, Taipei, Taiwan (04/25/11).*
- 9th Advanced Optical Methods Workshop. *UC Berkeley, (01/18/12).*
- "Magnetic nanoparticle based local hyperthermia for cell stimulation." BiSO/SPIE Photonic West*, San Francisco* (*Feb. 2013*)

(Prior to summer 2006)

- "High resolution 3d-SPT proves lipid rafts to be stable domains 50nm in diameter." *ASCB (1998).*
- "3-D high resolution particle tracking for optical tweezers by forward light scattering." *Focus on Microscopy / 11th Int. Conference on confocal microscopy . Heidelberg (August 1999).*
- "Photonic force microscopy: a new tool providing new methods to study membranes at the molecular level" *NanoBioTech 2000 forum Münster, Germany, (Sept. 2000).*
- "Fluorescence spectroscopy to study structural rearrangements in membrane proteins.*" MPI Schloessmann Seminar, Modern Optical Methods in Biology. Munich, (January 2001).*
- "Photonic force microscopy as tool for nanotechnology. " *NanoBioSymposium. Detroit, **Invited plenary speaker** (2002).*
- Thermal noise imaging as tool to study membrane dynamics and mechanics at the molecular level. *INSERM course on cell mechanics. Marseille, France, (November 2003).*
- FLIM based FRET quantification of a RanGTP-regulated gradient essential for mitosis in somatic cells. *Advanced Optical Methods Workshop. UC Berkeley, (January 2004).*

Contributed Conference Presentations

(Since fall 2006 only, University at Buffalo student presentation listed separately)

- "Protein domain motion tracked by Thermal Noise Imaging." Gordon Research Conference – Proteins (*Jul. 2009*).
- "Magnetic nanoparticle based RF field stimulation of neurons." Ann. Meeting Amer. Soc. for Neuroscience (*Dec. 2009*).
- "bimFCS to study protein membrane nanodomains." Gordon Research Conference - Single Molecule Approaches to Biology (chairs: N.H.Dekker and W.E.Moerner, Jul. 2010).
- "bimFCS to study protein-membrane domain association." Ann. Meeting Amer. Soc. for Cell Biology (*Dec. 2010*).
- "Local Cell Membrane Stiffness and Viscosity Mapped by Thermal Noise Imaging." Single Molecule Biophysics, Aspen Center for Physics. (organizers: S.Block and T.Perkins, Jan. 2011).
- "Local Cell Membrane Stiffness and Viscosity Mapped by Thermal Noise Imaging." March Meeting Amer. Phys. Soc. (*Feb. 2012*). Oral presentaion
- "Local Cell Membrane Stiffness and Viscosity Mapped by Thermal Noise Imaging." Gordon Research Conference - Single Molecule Approaches to Biology (chairs: J.M.Fernandez and S.W.Hell Jul. 2012).

Conference Presentations by University at Buffalo Students

- **Huang, H**. Delikanli, S,, Zeng, H., and Pralle, A. "Remote Steering of C. Elegans using Nanoparticle Heating." 53rd Ann. Meeting Amer. Biophys. Soc. (Feb. 2009) ***(Oral platform)***
- **Hsu, Y**. Rana, V. and Pralle, A. "Real-time 3D Tracking of Structural Transitions in Adenylate Kinase by Thermal Noise Imaging." 53rd Ann. Meeting Amer. Biophys. Soc. (Feb. 2009) ***(Oral platform presentation)***
- Huang, H. and Pralle, A. (2010) "TIRF FCS to study protei- membrane domain association." 54th Ann. Meeting Amer. Biophys. Soc. (*Feb. 2010*).
- Huang, H. and Pralle, A. (2011) Monitoring Association of Membrane Proteins with Micro-Domains and Cytoskeleton in Live Cells During Signaling and Perturbation, *Biophys. J.* 100(3), 252, 55th Ann. Meeting Amer. Biophys. Soc. (*Feb. 2011*).
- Hsu, Y. and Pralle, A. (2011) Nano-Scale, Microsecond Diffusion Imaging of Membrane Protein - lipid Raft Interaction in the Plasma Membrane, *Biophys. J.* 100(3), 254, 55th Ann. Meeting Amer. Biophys. Soc. (*Feb. 2011*).
- Hsu, Y. and Pralle, A. (2011) "Nano-Scale, Microsecond Diffusion Imaging of Membrane Protein - lipid Raft Interaction in the Plasma Membrane.", *Amer. Physical Soc. March Meeting*
- Simsek, M., Huang, H. and Pralle, A. (2012) "BimFCS Analysis of Membrane Protein Diffusion Reveals Dynamics of Membrane Cytoskeleton and Lipid Domains in Intact Cells", 56th Ann. Meeting Amer. Biophys. Soc. (*Feb. 2012*).
- Hsu, Y. and Pralle, A. (2012) "Local Cell Membrane Stiffness and Viscosity Mapped by Thermal Noise Imaging", 56th Ann. Meeting Amer. Biophys. Soc. (*Feb. 2012)*
- **Spoth, K.*,** Huang, H. and Pralle, A. "Simulations of Nanoparticle Heating for Remote Stimulation of Cells.", *Day of Excellence at UB (April 2012)* ** undergraduate student*

Ongoing Research Support

MRI 0923133	Berry (P.I.) / Pralle (P.I.)	09/15/09 – 09/14/12

National Science Foundation (NSF)
Grant Title: "MRI: Acquisition of a Confocal Microscopy System for Research and Education"
This support is used to establish a confocal microscopy facility for pulsed-light imaging for FLIM and FCS between Biology and Physics.
budget: $700,000 ($490k NSF+ $210 UB contribution) used to purchase LSM710 microscope

R01 MH094730 Pralle (sole P.I.) 09/10/11 – 09/09/15
NIH/NIMH (National Institute of Mental Health)
Grant Title: "Deep Tissue Magneto-Genetic Cell-Stimulation for Neuroscience and Therapy"
To develop remote magnetic stimulation of individual neurons in mice using magnetic field nanoparticle heating and genetically targeted temperature sensitive ion-channels.
Role: P.I. budget: $1,295,000

HFSP RGP0052/2012 06/01/12 – 05/31/15
Human Frontiers Science Program
Pralle (P.I.) + three Co-I.: Schueler, Parak and Knoepfel
Grant Title: "Magnetogenetics: remote stimulation of mammalian neurocircuitry using nanoparticle heating"
To optimize the nanoparticles, their spatial arrangements, targeting on the cells and ion-channels use for magneto-genetic stimulation of neurons.
Role: P.I. budget: $1,200,000 (UB $300,000)

R21 AI097879-01 Pralle (P.I.) + Connell (Co-I.) 07/01/12 – 06/30/14
NIH/NIAID
Grant Title: "Membrane biophysics of enterotoxin mediated immunomodulation"
To our recently developed bimFCS to study the effect of enterotoxins on the cell membrane structure and correlate to immune signaling to develop an understanding of adjuvants.
Role: P.I. budget: $427,042

Completed Research Support

University at Buffalo, SUNY, **Start Up Funds** (Pralle) 09/01/06 – 06/30/10

Sloan Foundation Professional Science Master (PI: Pitman, CoI: Pralle)
Teaching Lab for Biophysics track for PSM, 09/01/08 – 08/31/09

Interdisciplinary Research Development Fund, 08/01/07 – 2008
Pralle (P.I.) ; Zheng (CoI); Qin (CoI.)

Prior to University at Buffalo

Human Frontiers Science Program fellow grant $120,000 05/01/01 – 04/30/04
European Molecular Biology Organization fellow $30,000 05/01/99 – 04/30/00