Matthew S. Bogyo

Department of Pathology
Stanford Medical School
300 Pasteur Drive
Stanford, CA 94305

(650) 866-6515 (office)
(415) 516-9636 (cell)
(650) 498-9764 (home)
mbogyo@stanford.edu

EDUCATION

Massachusetts Institute of Technology, Cambridge, MA
Ph.D. in Biological Chemistry- Department of Chemistry, September 1997
Bates College, Lewiston, ME
Bachelor of Science in Chemistry, May 1993

PROFESSIONAL AND ADVISORY POSITIONS

Professional Positions

2009	Ad-Hoc Member – SBCB Study Section
2008	Co-Founder and Member, Board of Directors – Akrotome Imaging Inc.
2005-2009	Associate Professor by Courtesy – Department of Chemical and Systems Biology, Stanford University
2004-2009	Associate Professor - Department of Microbiology and Immunology, Stanford University.
2003-2009	Associate Professor - Department of Pathology, Stanford University.
2005-2009	Assistant Professor by Courtesy – Department of Chemical and Systems Biology, Stanford University
2004-2009	Assistant Professor - Department of Microbiology and Immunology, Stanford University.
2003-2009	Assistant Professor - Department of Pathology, Stanford University.
2002-present	Adjunct Faculty Member – UCSF Department of Pharmaceutical Chemistry
2001-2003	Group Leader, Head of Chemical Proteomics- Celera Genomics, South San Francisco, CA.
1998–2001	UCSF Faculty Fellow- University of California, San Francisco, San Francisco, CA.

Professional Activities

2007	President – International Proteolysis Society
2007	Vice-Chair – International Proteolysis Society - 5th General Meeting, Petras, Greece
2007	Section Editor – *Current Opinion in Chemical Biology* – Feb 2007 issue – Proteomics and Genomics
2005-2007	Secretary of International Proteolysis Society –www.protease.org
2005-presant	Council Member – International Proteolysis Society
2003-present	Scientific Consultant- Proteolix, South San Francisco, CA.
2003-2006	Scientific Consultant- Celera, South San Francisco, CA.
2003	Section Editor – *Current Opinion in Chemical Biology* – Feb 2003 issue – Proteomics and Genomics
2002-present	Faculty Member – Faculty of 1000 – Protein Chemistry and Proteomics Section
2002-present	Editorial Board Member – *Molecular & Cellular Proteomics.*
2002-present	Editorial Board Member – *Chemistry and Biology.*
2002-2006	Editorial Board Member – *Biochemical Journal.*
2000-2001	Scientific Consultant- Axys Pharmaceuticals, South San Francisco, CA.
2000–2001	Scientific Consultant- ActivX Biosciences, La Jolla, CA.
2000-2001	Scientific Consultant- Rigel Pharmaceuticals, South San Francisco, CA.

AWARDS AND FELLOWSHIPS

2008	Strategic Program for Asthma Research – Early Excellence Award
2005	Burroughs Wellcome Fund – Investigators in Pathogenesis of Infectious Disease Award
2004	Searle Scholar Award
2003	Recipient of Stanford University Terman Fellowship
1995	Recipient of MIT-Japan Science and Technology Prize
1992	American Chemical Society-Division of Polymer Chemistry award for organic synthesis

1992 American Institute of Chemists award for outstanding performance in chemistry
1991–1993 Recipient of pre-doctoral fellowships from Council on Undergraduate Research

TEACHING

MPHA 220 – Co-Founder of new course with T. Wandless, D. Hershlag, J. Chen "Chemistry of Biological Processes". Primary Lecturer Fall 2004, Fall 2005. Fall 2007
Bio 241 – Discussion leader Winter 2004, Lecturer Winter 2006, Discussion leader Winter 2006
CBio 241 – Lecturer Fall 2003, 2004, 2005, 2006 ,2007 Discussion leader Fall 2005
CBio 242 – Lecturer Summer 2007
CBio 280 – Discussion leader Spring 2005
M&I 210 - Lecturer Winter 2005, 2006, Spring 2007
M&I 215 – Lecturer Winter 2005, 2006, 2007
BMI234 – Lecturer Winter 2005, 2007

INVITED LECTURES

Mt. Sinai School of Medicine – Department of Microbiology and Immunology Seminar Series – Dec 2008.
National Institutes of Health – Chemistry seminar series Bethesda, MD November 2008
Gordon Conference – Proteolytic enzymes and their inhibitors **-** New Hampshire – July 2008
Gordon Conference – Bioorganic Chemistry **-** New Hampshire – June 2008
Department of Molecular Biology – University of Texas Southwestern Medical Center – Dallas Texas April 2008
Max-Planck-Institut für Züchtungsforschung – Department Seminar – Cologne, Germany – March 2007.
Genomes to Systems Conference - Chemical Genomics: Small molecules with large effects – Manchester, UK March 2007.
Lorne Conference on Protein Structure and Function – Lorne, Victoria, Australia February 2008
Department of Microbiology & Immunology – Albert Einstein College of Medicine – seminar series – Dec 2007
Cambridge Healthtech Institute – in vitro molecular imaging meeting – San Diego November 2008
International Proteolysis Society – General meeting – invited speaker – Petras, Greece Oct. 2007
Human Proteome Organization (HUPO) – 6th Annual World Congress – Seoul, Korea Oct. 2007
Drug Action and Chemical Biology in the Post-Genomic Era – Invited speaker – Vienna, Austria Aug 2007
Societat Catalana de Biologia - Perspectives in Genomics and Proteomics – Barcelona, Spain Jul. 2007
American Peptide Syposium – 20th National Symposium – Montreal, Canada June 2007
Advances in Optics for Biotechnology, Medicine, and Surgery – Invited Speaker – Naples, FL June 2007
Seattle Biomedical Research Institute - Seattle Parasitology Conference - Seattle, WA – May 2007
University of California Riverside – Dept. of Cell Biology and Neuroscience seminar – Riverside, CA – May 2007
Searle Scholars – Lecture at annual meeting – Chicago, Il April 2007
Molecular Cell Biology and Biotechnology seminar series – Virginia Tech – Feb 2007
Department of Pharmacology Seminar – Yale University – Feb 2007
Biochemcial Society – Proteomics and Proteolysis – London England Jan 2007
Department of Chemistry Seminar - University of California, Berkeley – Nov 2006.
Department of Microbiology Seminar – University of Vermont – Oct 2006
American Chemical Society Southwest Regional Meeting – Invited lecture – Oct 2006
5th International Conference on Cysteine Proteinases and Their Inhibitors: From structure to regulation and biology – Portoroz, Slovenia Sept. 2006
18th International Congress on Fibrinolysis and Proteolysis – San Diego, CA Aug 2006
Gordon Research Conference – Proprotein Processing, Trafficking & Secretion- July 2006
Novartis Institutes for Biomedical Research – Weekly seminar – Cambridge, MA May 2006
University of Iowa – Bioinformatics lecture series – April 2006
Association of Biomolecular Resource Facilities – Annual Meeting – Long Beach, CA Feb 2006
Toxoplasma Infections in the Immune Competent Host-Possible Application to Human Neuropsychiatric Diseases – Annapolis, MD November 2005
University of Southern California – Chemical Biology Seminar Series – November 2005
University of California San Francisco, Chemistry and Chemical Biology seminar series – Oct 2005
International Proteolysis Society – 4th general meeting – Quebec, Canada Oct 2005
Society for Molecular Imaging – 4th Annual Meeting – Cologne, Germany Sept 2005
University of California San Francisco –Biophysics/Chemistry & Chemical Biology Seminar Series– Oct 2005
IXth International Symposium on Proteinase Inhibitors and Biological Control – Brdo, Slovenia June 2005
Celera Genomics – Chemistry Department Seminar Series – June 2005
American Association for the Study of Liver Diseases - Functional Genomics and Proteomics of Liver in Health and Diseases – June 2005

Genentech – Invited by Dr. Robert Lazarus Department of Protein Engineering - March 2005
Washington University School of Medicine - Department of Molecular Microbiology Seminar - March 2005
Scripps Research Institute – Molecular and Cell Biology Affinity Group seminar series – November 29, 2004
American Society of Microbiologists - Conference on Functional Genomics and Bioinformatics Approaches to Infectious Disease Research – October 2004
Molecular Parasitology Meeting XV – Woods Hole, MA – September 2004.
American Chemical Society – National Meeting. "Genomic Approaches to Enzymology" – August 2004
Gordon Research Conference – Proteolytic Enzymes and Their Inhibitors - July 2004
McGill University - Chemical Biology/Archibald Macallum Seminar Series – June 2004
University of Washington School of Medicine–Department of Genome Sciences Lecture Series – June 2004
Lorne Conference on Protein Structure and Function – Lorne, Victoria, Australia February 2004
Molecular Approaches to Malaria - Lorne, Victoria, Australia February 2004
American Society for Cell Biology National Meeting – Special Session "The interface Between Small Molecule Chemistry and Cell Biology"– December 2003
International Proteolysis Society - 3rd general meeting - Nagoya, Japan November 2003
Oregon Health & Sciences University - Keynote Lecture for Department of Microbiology and Immunology Retreat. November 2003
Horizon Symposium - Third Symposium on Proteolysis - Verona, Italy October, 2003
Genomics on Target - IBC conference Boston, MA October , 2003
Proteomics: The Chemical Tools and Challenges - Churchill College, Cambridge, UK July 2003
University of Leiden - Department of Chemistry Seminar Series - May 2003
University of Pennsylvania Medical School - George Raizzis seminar series November 2002
American Association for Cancer Research – "Ubiquitination in Normal and Cancer Cells" Vancouver, British Columbia. November 2002
American Association for Cancer Research – "Proteases, Extracellular Matrix, and Cancer" Hilton Head, South Carolina October 2002
International Society for Fibrinolysis and Proteolysis –Munich, Germany September 2002
American Chemical Society- National Meeting Boston, Massachusetts August 2002
Gordon Research Conference- "Proteolytic enzymes and their inhibitors" July 2002
ASBMB Annual Meeting- Experimental Biology 2002, Proteomics section April 2002
University of British Columbia - Protein Engineering Network Symposium - March 2002
Gordon Research Conference- "Chemistry and Biology of Peptides" February 2002
International Proteolysis Society - 2rd general meeting - Munich, Germany November 2001
Israeli Society for Combinatorial Technologies- Israeli CombiTech Symposium Rohovot, Israel October 2001
American Chemical Society- National Meeting Chicago, Illinois August 2001
5th International Symposium on Mass Spectrometry in the Health and Life Sciences- "Molecular and Cellular Proteomics" San Francisco, California August 2001
Merck Research Laboratories - Rahway, New Jersey July 2001
7th Brdo Symposium on Proteinase Inhibitors and Biological Control -Brdo Slovenia June 2001
Cold Spring Harbor Symposium- "Proteolysis and Biological Control" May 2001
University of Munich- Department of Clinical Biochemistry Munich, Germany February 2001
Albert-Ludwigs-University Freiburg- Institute for Molecular Medicine Freiburg, Germany February 2001
Surface Logix- Boston, Massachusetts February 2001
Affimax Research Institute- Santa Clara, California February 2001
The Burnham Institute- La Jolla, California January 2001
Axys Pharmaceuticals - South San Francisco, California November 2000
Rigel Pharmaceuticals - South San Francisco, California November 2000
Cysteine Proteinases and their Inhibitors: The new Millennium- Portoroz, Slovenia September 2000
Conference of the World Molecular Engineering Network- Cabo San Jose, Mexico April 2000
Axys Pharmaceuticals - South San Francisco, California March 2000
University of Utah- Department of Biochemistry March 2000
The Scripps Research Institute- November 1999
American Chemical Society- Northwest Regional Meeting June1999
University of California, San Francisco-Department of Pharmaceutical Chemistry retreat December 1998
Gordon Research Conference- "Proteolytic enzymes and their inhibitors" June 1998
Janssen-Cilag Club de la Transplantation meeting - Paris, France October 1997
American Peptide Symposium – Nashville, Tennessee June 1997
Cold Spring Harbor Symposium- "Biology of Proteolysis" April 1997
University of California, San Diego - Department of Pathology March 1997

PATENTS

1. H. L. Ploegh, H. A. Chapman, **M. Bogyo**, and P.R. Wolf. "Suppression of Immune Responses Via Inhibition of Cathepsin S". Patent number 6608030 issued Aug. 19, 2003.

2. A. Nepveu, B. Goulet, N-S. Moon, M. Bogyo, A. Baruch, P. Watson "Methods for diagnosing the presence or stage of cancer" Pending PCT application number 10/535,156 Filed Nov. 13, 2003.

3. **M. Bogyo** and S.H.L. Verhelst. "Synthesis of Epoxide Based Inhibitors of Cysteine Proteases". PCT application 11/329,818 Filed Jan 10, 2006.

4. **M. Bogyo**, S.H.L. Verhelst and A.M. Sadaghiani "Design and Synthesis of Novel Cysteine Protease Cathepsin Inhibitors for Cancer Chemotherapy" US PCT/US2008/0176841.

5. **M. Bogyo**, G. von Degenfeld and G. Blum 'Imaging of Protease Activity in Live Cells Using Activity Based Probes' US patent application 11/502,255 Filed Aug 10, 2006.

6. **M.Bogyo** and A. Berger "Selective inhibitors and active site probes of caspases" Provisional US Patent Application 60/819,233.

7. **M.Bogyo** and Fruh K. " Cathepsin B as a drug target for Kaposi's Sarcoma" Disclosure S06-075.

8. **M.Bogyo**, M. Fonovic and S. Verhelst "Mild Chemically Cleavable Linker For Proteomic Applications" Provisional US Patent application 60/835,548.

9. **M. Bogyo**, G. Blum, A.B. Berger, Z. Chen, S.S. Gambhir "Probes for in vivo targeting of active cysteine proteases" US Provisional Patent 3815.52.

10. L. Edgington, A. Berger, G. Blum, **M. Bogyo** "Use of Tat peptides to enhance uptake of imaging agents into apoptotic cells" Provisional application 61/145,352.

PUBLICATIONS

1. Wenzel, T. , **Bogyo, M**., and Lebeau, E., (1994) Lanthanide-cyclodextrin complexes as probes for elucidating optical purity by NMR spectroscopy. *Journal of the American Chemical Society*, 116, 4858-4865.

2. Wiertz, E. J. H. J., Jones, T. R., Sun, L., **Bogyo, M**., Geuze, H. J., and Ploegh, H. L. (1996) The human cytomegalovirus US11 gene product dislocates MHC class I heavy chains from the endoplasmic reticulum to the cytosol. *Cell*, 84, 769-779.

3. Wiertz, E. J. H. J., Tortorella, D., **Bogyo, M**., Yu, J., Mothes, W., Jones, T. R., Rapoport, T. A., and Ploegh, H. L. (1996) Sec61-mediated transfer of a membrane protein from the endoplasmic reticulum to the proteasome for destruction. *Nature*, 384, 432-438.

4. Jallepalli, P. and **Bogyo, M**. (1997) A degrading Business: the biology of proteolysis. *Trends in Cell Biology*, 7, 333-335.

5. **Bogyo, M**., McMaster, J. S., Gaczynska, M., Tortorella, D., A.L. Goldberg and Ploegh, H. L. (1997) Covalent modification of the active site threonine of proteasomal □-subunits and the *Escherichia coli* homologue HslV by a new class of inhibitors. *Proceedings of the National Academy of Sciences USA*, **94**, 6629-6634.

6. **Bogyo, M**., Gaczynska, M., Ploegh, H. L. (1997) Proteasome inhibitors and antigen presentation. *Biopolymers Peptide Science*. 47, 269-280.

7. Ruepp, A., Eckerskorn, C., **Bogyo, M**., and Baumeister, W. (1998) Proteasome function is dispensable under normal but not under heat shock conditions in *Thermoplasma acidophilum*. *FEBS Lett.,* 425, 87-90.

8. Glas, R., **Bogyo, M**, McMaster, J. S., Gaczynska, M., Ploegh, H. L. (1998) A proteolytic system that compensates for loss of proteasome function. *Nature*, 392, 618-622.

9. **Bogyo, M**., McMaster, J. S., Shin, S., Ploegh, H. L. (1998) Substrate binding and sequence selectivity of the proteasome revealed by active site directed affinity probes. *Chemistry and Biology*, **5**, 307-320.

10. **Bogyo, M**. and Ploegh, H. L. (1998) A protease draws first blood. *Nature*. 396, 625-27.

11. Selzer, P. M., Pingel, S., Hsieh, I., Ugele, B., Chan, V. J., Engel, J. C., **Bogyo, M**., Russell, D. G., Sakanari, J. A., and McKerrow, J. H. (1999) Cysteine protease inhibitors as chemotherapy: Lessons from a parasite target. *Proceedings of the National Academy of Sciences, USA*, 96, 11015-11022.

12. Schmidtke, G., Holzhütter, **Bogyo, M**., Kairies, N., Groll, M., de Giuli, R., Emch, S., and Groettrup, M. (1999) How an inhibitor of the HIV-1 protease modulates proteasome activity. *J. Biol. Chem*., 274. 35734-35740.

13. **Bogyo, M**., Verhelst, S., Bellingard-Dubouchaud, V., Tobe, S., and Greenbaum, D. (2000). Selective targeting of lysosomal cysteine proteases with radio-labeled substrate analogs. *Chemistry and Biology*. **7**, 27-38.

14. Caffrey, C.R., Mathieu, M.A., Gaffney, A.M., Salter, J.P., Sajid, M., Lucas, K.D., Franklin, C., **Bogyo, M**., and McKerrow, J.H. (2000) Identification of a cDNA encoding an active asparaginyl endopeptidase of *Schistosoma mansoni* and its expression in *Pichia pastoris*. *FEBS Letters*. 466. 1-5.

15. Greenbaum, D. Medzihradszky, K.F. Burlingame, A. and **Bogyo, M.** (2000) Epoxide Electrophiles as Activity-Dependent Cysteine Protease Profiling and Discovery Tools. *Chemistry and Biology,* **7**, 569-581.

16. Wang, E., Kessler, B., Borodovsky, A., Cravatt, B., **Bogyo, M**., Ploegh, H. L., and Glas, R., (2000) Integration of the ubiquitin-proteasome pathway with a cytosolic oligopeptidase activity. *Proceedings of the National Academy of Sciences, USA*, 97, 9990-9995.

17. Weihofen, A., Lemberg, M. K., Ploegh, H., **Bogyo, M**. and Martiglio, B. (2000) Release of signal peptide fragments into the cytosol requires intramembrane cleavage by a protease activity that is specifically blocked by a novel cysteine protease inhibitor. *J. Biol. Chem.,* 275, 30951-30956.

18. Li, J., Gao, J., Ortega, J., Nazif, T., Joss, L., **Bogyo, M.**, Steven, A., and Rechsteiner, M. (2001). Proteasome activation by 11S REG (PA28) homologs: lysine 188 substitutions convert the pattern of proteasome activation by REG γ to that of REGs α and β. *EMBO J.*, 20, 3359-3369.

19. Nazif, T., and **Bogyo, M**. (2001) Global analysis of proteasomal substrate specificity using positional-scanning libraries of covalent inhibitors. *Proceeding of the National Academy of Sciences, USA*, 98, 2967-2972.

20. Baruch, A., Greenbaum, D., Levy E.T., Nielsen P.A., Gilula, N.B., Kumar, N.M., and **Bogyo, M.** (2001) Defining a link between gap junction communication, proteolysis, and cataract formation. *J. Biol. Chem.*, 276, 28999-29006.

21. Caffrey, C.R., Hansel, E., Lucas,K D., Brinen, L.S., Alvarez Hernandez, A., Cheng, J., Gwaltney, S.L.II, Roush, W.R., Stierhof, Y-D., **Bogyo, M.** , Steverding, D. and McKerrow, J.H. (2001) Active site mapping, biochemical properties and subcellular localization of rhodesain, the major cysteine protease of *Trypanosoma brucei* rhodesiense. *Molecular & Biochemical Parasitology*, 118, 61-73.

22. **Bogyo, M**., and Wang, E.W.(2002) Proteasome Inhibitors: Complex tools for a Complex Enzyme. *Current Topics in Microbiology and Immunology*, 268, 185-208.

23. Mathieu, M.A., **Bogyo, M.**, Caffrey, C.R., Choe, Y., Lee, J., Chapman, H., Sajid, M., Craik, C.S., and McKerrow, J.H. (2002) Substrate specificity of schistosome versus human legumain determined by P1-P3 peptide libraries. *Molecular & Biochemical Parasitology,*121, 99-105.

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25. Groll, M., Nazif. T., Huber, R., and **Bogyo, M.** (2002) Probing structural determinants distal to the site of hydrolysis that control substrate specificity of the 20S proteasome. *Chemistry and Biology*, **9**, 655-662.

26. Greenbaum, D., Arnold, W., Lu, F., Hayrapetian, L., Baruch, A., Krumrine, J., Toba, S., Chehade, K., Bromme, D., Kuntz, I.D., and **Bogyo, M.** (2002) Small Molecule affinity fingerprinting: a tool for enzyme family sub-classification, target identification, and inhibitor design. *Chemistry and Biology*, 9, 1085-1094.

27. Greenbaum, D., Baruch, A., Grainger, M., Bozdech, Z., Medzihradszky, K., Engel, J., Holder, T., DeRisi, J., and **Bogyo, M.** (2002) A role for the cysteine protease falcipain 1 in host cell invasion by the malaria parasite, Plasmodium falciparum. *Science*, 298, 2002-2006.

28. Kessler, B., Hong, X., Petrovic, J., Borodovsky, A., Dantuma, N.P., **Bogyo, M.**, Overkleeft, H.S., Ploegh, H., and Glas, R. (2003) Pathways accessory to proteasomal proteolysis are less efficient in MHC class I antigen presentation. *J. Biol. Chem.* 278, 10013-21.

29. Mikolajczyk, J., Boatright, K.M., Stennicke, H.R., Nazif, T.M., Potempa, J., **Bogyo, M.**, and Salvesen, G.S. (2003) Sequencial autocatalytic processing activates the zymogen of the caspase homolog Arg-ginigipain. *J. Biol. Chem.* 278, 10458-64.

30. **Bogyo, M**. and Hurley, J. (2003) Proteomics and Genomics. *Current Opinions in Chemical Biology*. 7, 2-4.

31. Jeffery, D., and **Bogyo, M.** (2003) Chemical proteomics and applications to drug discovery. *Current Opinions in Biotechnology*. 14, 82-86.

32. Wang, C.C., Bozdech, Z., Liu, C., Harris, J., and **Bogyo, M**. (2003) Biochemical analysis of the *Tropanosoma brucei* proteasome. *J. Biol. Chem.* 278, 15800-8.

33. Rozman-Pungercar, J., Kopitar Jerala, N., **Bogyo, M.**,Turk, D., Vasiljeva, O., Stefe, I., Vandenabeele, P., Brömme, D., Puizdar, V., Fonovic, M., Trstenjak-Prebanda, M., Dolenc, I., Turk, V., and Turk, B. (2003) When reaction mechanism is more important than specificity: Inhibition of papain-like cysteine proteases and legumain by "caspase-specific" inhibitors. *Cell Death and Differentiation*, 10, 881-888.

34. Yasothornsrikul, S., Greenbaum, D., Medzihradszky, K., Toneff, T., Bundey, R., Miller, R., Schilling, B., Petermann, I., Dehnert, J., Logvinova, A., Goldsmith, P., Neveu, J., Lane, W., Gibson, G., Reinheckel, T., Peters, C., **Bogyo, M.***, and Hook, V. (2003) Cathepsin L in secretory vesicles functions as a prohormone-processing enzyme for production of the enkephalin peptide neurotransmitter. *Proceedings of the National Academy of Sciences, USA*, 100, 9590-9595. *Co-Senior Authors.

35. Sajid M., McKerrow J.H., Hansell E., Mathieu M.A., Lucas K.D., Hsieh I., Greenbaum D., **Bogyo M**., Salter J.P., Lim K.C., Franklin C., Kim J.H., Caffrey C.R..(2003) Functional expression and characterization of Schistosoma mansoni cathepsin B and its trans-activation by an endogenous asparaginyl endopeptidase. *Mol. Biochem. Parasitol*., 131, 65-75.

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37. Baruch, A., Jeffery D., and **Bogyo, M.** (2004) Enzyme activity – it's all about image. *Trends in Cell Biology*. 14, 29-35.

38. Medzihradszky, K.F., Darula, Z., Perlson, E., Fainzilber, M., Chalkley, R.J., Ball, H., Greenbaum, D., **Bogyo, M.**, Tyson, D.R., Bradshaw, R.A., and Burlingame, A.L. (2004) O-Sulfonation of serine and threonine - mass spectrometric detection and characterization of a new posttranslational modification in diverse proteins throughout the eukaryotes. *Mol. Cell. Proteomics*. 3, 429-440.

39. Goulet, B., Baruch, A., Greenbaum, D., Moon, N.-S., Poirier, M., Erickson, A., **Bogyo, M.***, and Nepveu, A.* (2004) A role for the lysosomal cysteine protease cathepsin L in transcriptional regulation in the nucleus. *Molecular Cell*. 14, 207-219.

40. Joyce, J., Baruch, A., Chehade, K., Greenbaum, D., Meyer-Morse, N., Tsai, F-Y., Greenbaum, D., Hager, J., **Bogyo, M.***, and Hanahan, D.* (2004) Cathepsin cysteine proteases are effectors of invasive growth and angiogenesis during multistage tumorigenesis. *Cancer Cell*. 5, 443-453. *Co-Senior Authors.

41. Yasuda Y, Li Z, Greenbaum D, Bogyo M, Weber E, Bromme D. (2004) Cathepsin V: A novel and potent elastolytic activity expressed in activated macrophages. *J Biol Chem*. 279, 36761-36770.

42. Eksi,S., Czesny, B., Greenbaum, D.C., **Bogyo, M.**, and Williamson, K. (2004) Targeted disruption of Plasmodium falciparum cysteine protease, falcipain 1, reduces oocyst production, not erythrocytic stage growth. *Molecular Microbiology*. 53, 243-250.

43. **Bogyo, M.,** Baruch A., Jeffery, D.A., Greenbaum, D., Ovaa, H., Borodovsky, A., and Kessler, B. (2004) Applications of chemical probes of proteolytic activity. *Current Protocols in Protein Science*. Sep;Chapter 21:Unit 21.17

44. Van Der Hoorn RA, Leeuwenburgh MA, **Bogyo M**, Joosten MH, Peck SC. (2004) Activity profiling of papain-like cysteine proteases in plants.*Plant Physiol*. 135, 1170-1178.

45. Oleksy A, Golonka E, Banbula A, Szmyd G, Moon J, Kubica M, Greenbaum D, **Bogyo M**, Foster TJ, Travis J, Potempa J. (2004) Growth phase-dependent production of a cell wall-associated elastinolytic cysteine proteinase by Staphylococcus epidermidis*. Biol Chem*. 385, 525-535.

46. Hook V, Yasothornsrikul S, Greenbaum D, Medzihradszky KF, Troutner K, Toneff T, Bundey R, Logrinova A, Reinheckel T, Peters C, **Bogyo M**. (2004) Cathepsin L and Arg/Lys aminopeptidase: a distinct prohormone processing pathway for the biosynthesis of peptide neurotransmitters and hormones. *Biol Chem*. 385, 473-480.

47. Snipas SJ, Wildfang E, Nazif T, Christensen L, Boatright KM, **Bogyo M**, Stennicke HR, Salvesen GS. (2004) Characteristics of the caspase-like catalytic domain of human paracaspase. *Biol Chem*. 385, 1093-1098.

48. Berger, A.B., Vitorino, P.M., and **Bogyo, M**. (2004) Activity-based protein profiling: applications to biomarker discovery, *in vivo* imaging and drug discovery. *Am. J. of Pharmacogenomics*, 4, 371-381.

49. Borodovsky A, Ovaa H, Meester WJ, Venanzi ES, **Bogyo M**, Hekking BG, Ploegh HL, Kessler BM, Overkleeft HS. (2005) Small-molecule inhibitors and probes for ubiquitin- and ubiquitin-like-specific proteases. *ChemBioChem,* 6, 287-291.

50. Chehade, K.A.H., Baruch, A., Verhelst, S.H.L., and **Bogyo, M.** (2005) An improved preparation of the activity-based probe JPM-OEt and in situ applications. *Synthesis*, 2, 240-244.

51. Verhelst, S.H.L., and **Bogyo, M.** (2005) Chemical proteomics applied to target identification and drug discovery. *BioTechniques*, 38, 175-177.

52. Verhelst, S.H.L., and **Bogyo, M.** (2005) Solid Phase Synthesis of double headed epoxysuccinyl activity based probes for selective targeting of papain family cysteine proteases. *ChemBioChem*, 6, 824-827.

53. Phillips, C.I., and **Bogyo, M.** (2005) Proteomics meets microbiology: technical advances in the global mapping of protein expression and function. Cellular Microbiology 7(8) 1061-76.

54. Kato, D., Boatright, K.M., Berger, A.B., Nazif, T., Blum, G., Ryan, C., Chehade, K.A.H., Salvesen, G., and **Bogyo, M.** (2005) Activity based probes that target diverse cysteine protease families. *Nature Chemical Biology*. 1, 33-38.

55. Blum, G., Mullins, S.R., Keren, K., Fonovic, Jedeszko, C., Rice, M.J., Sloane, B.F., and **Bogyo, M.** (2005) Dynamic imaging of protease activity with fluorescently quenched activity-based probes. *Nature Chemical Biology*, 1, 203-209.

56. Hook V, Toneff T, **Bogyo M**, Greenbaum D, Medzihradszky KF, Neveu J, Lane W, Hook G, and Reisine T. (2005) Inhibition of cathepsin B reduces beta-amyloid production in regulated secretory vesicles of neuronal chromaffin cells: evidence for cathepsin B as a candidate beta-secretase of Alzheimer's disease. *Biol. Chem.* 386, 931-940.

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58. **Bogyo M.** (2005) Screening for selective small molecule inhibitors of the proteasome using activity-based probes. *Methods Enzymol*. 399, 609-22.

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