

Andrew James Bonham

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Education:

- 2004-2010 **Ph.D. in Biochemistry & Molecular Biology, Biophysics & Bioengineering emphasis**
Biomolecular Science & Engineering program, Advisor: Dr. Norbert Reich (reich@chem.ucsb.edu)
University of California at Santa Barbara
Dissertation Topic: **Novel Optical Techniques for Exploring the DNA Binding Affinity and Specificity of Eukaryotic Transcription Factors and Transcription Factor Complexes.**
- 2000-2004 **B.A. in Chemistry, B.A. in Biochemistry;** Minor in Philosophy
University of Colorado at Boulder; Magna cum laude
Honors Thesis: **Crystallographic investigations of the Foxp2 winged-helix DNA-binding protein.**

Teaching Experience:

- 2007 **Instructor / Teaching Associate for CHEM 1C: General Chemistry**
Created and gave daily lectures; wrote and implemented course lesson plan.
Wrote homework and exams, held review sessions, proctored, held office hours.
- 2008 **Teaching Fellow for Summer Teaching Institute for Associates**
Led discussions and group activities on teaching strategies, course planning, and effective learning for first-time Associates/Lecturers at a University level.
- 2005-2010 **Graduate Mentor for Undergraduate Students**
Led students in year-long or greater research projects; taught techniques, guided experiments, and encouraged critical thought. Former/current students include Michael Groden, Leah Osslund, Eric Sankey.
- 2009 **ICB Sabre (Summer Applied Biotechnology Research Experience) Mentor**
Led Joelle Stanford, a chemistry undergraduate student from Florida A&M, on a summer-long research project for the Institute for Collaborative Biotechnologies' Sabre project.
- 2008 **Mentor for UCSB Pre-College Research Mentorship Program in Biochemistry**
Introduced high school student Eric Cappello to the world of research; led student on summer-long research project and helped them present a talk on their experience.
- 2008,2009 **Teaching Assistant for MCDB109L: Biochemistry Laboratory**
Instructed intensive laboratory sections, guided students on projects, wrote quizzes, answered questions.
- 2005,2006 **Teaching Assistant for CHEM125L: Biochemistry Laboratory for Graduate Students**
Instructed intensive fulltime two week laboratory section, guided students on projects, wrote quizzes, answered questions.
- 2005,2006 **Teaching Assistant for MCDB 131L: Microbiology Laboratory**
Instructed two laboratory sections, guided student projects, wrote quiz questions, answered questions.
- 2006-2009 **ScienceLine Answerer**
Participated in UCSB internet project to answer the science questions of children K-12.
- 2008 **Family Ultimate Science Exploration (FUSE) Seminar Leader**
Led science workshops for middle school students and parents to explore chemistry in everyday life.

Publications:

Andrew J. Bonham.

Novel optical techniques for exploring the DNA binding affinity and specificity of eukaryotic transcription factors and transcription factor complexes. Dissertation, March 2010, open access: <http://proquest.umi.com/pqdweb?did=2031660581&Fmt=2&RQT=309>

Thorsten Neumann, **Andrew J. Bonham**, Gregory Dame, Bernd Berchtold, Oswald Prucker, Norbert O. Reich, and Juergen Ruehe.

Temperature and time resolved TIRF analysis of reusable DNA hydrogel chips. *Anal. Chem.*, 2010, 82(14), 6124-6131, doi:10.1021/ac1008578.

Andrew J. Bonham, Thorsten Neumann, Matthew Tirrell, and Norbert O. Reich.

Tracking transcription factor complexes on DNA using total internal reflectance fluorescence protein binding microarrays. *Nuc. Acids Res.*, 2009, 37(13), e94, doi:10.1093/nar/gkp424

Andrew J. Bonham, Gary Braun, Ioana Pavel, Martin Moskovits, and Norbert O. Reich.

Detection of Sequence-Specific Protein-DNA Interactions via Surface Enhanced Resonance Raman Scattering. *J. Amer. Chem. Soc.*, 2007, 129 (47), p 14572–14573, doi:10.1021/ja0767837

Francesco Ricci, **Andrew J. Bonham**, Aaron C. Mason, Norbert O. Reich, and Kevin W. Plaxco.

Reagentless, Electrochemical Approach for the Specific Detection of Double- and Single-Stranded DNA Binding Proteins. *Anal. Chem.*, 2009, 81 (4), p 1608–1614, doi:10.1021/ac802365x

Teisha Jane Rowland, Liane M Miller, Alison J Blaschke, E. Lauren Doss, **Andrew J. Bonham**, Sherry T Hikita, Lincoln V Johnson, Dennis O Clegg.

Roles of Integrins in Human Induced Pluripotent Stem Cell Growth on Matrigel and Vitronectin. *Stem Cells and Development.* doi:10.1089/scd.2009.0328

Andrew J. Bonham, Leah M. Osslund, Aaron J. Prussin II, Nikola Wenta, Uwe Vinkemeier, and Norbert O. Reich.

STAT1 DNA-sequence dependent binding specificity modulation by phosphorylation, protein:protein interactions, and small molecules. In preparation.

Teaching Skills:

Proven ability to successfully mentor students; comfortable and confident lecturer and speaker; experienced discussion leader; experience writing and implementing lesson plans; confident public speaker; excellent proficiency with modern technology in and out of the classroom; outstanding pastoral skills and rapport with students; comprehensive knowledge of general chemistry, biochemistry, and molecular biology topics; consistently excellent teaching evaluations (top 5% of TAs); familiarity with current pedagogy and teaching strategies; inquire for excellent student references.

Research Experience:

2010-

Postdoctoral Fellowship in Kevin W. Plaxco's Bio-Sensor Lab

Designed and implemented novel bio-sensors based on aptamers and protein:DNA recognition for the detection of renal failure, developmental progress, and oncogenesis.

2004-2010

Ph.D. Graduate Student Researcher in Biomolecular Science and Engineering program

Developed novel total internal reflectance and fluorescence (TIRF) and Raman spectroscopic assays for the investigation of multiprotein transcriptional regulatory protein complexes across dsDNA microarrays.

2002-2004

Undergraduate Researcher, University of Colorado at Boulder

Cloned, expressed, and purified proteins ANC-1 and Foxp2 for X-ray crystallographic studies. Established crystal screening trials, analyzed protein crystals.

Prof. Lin Chen laboratory at UC Boulder. Supervisor: Darren Bates.

2000-2001

Undergraduate Researcher, University of Colorado at Boulder

Performed photobleaching experiments on fluorescently-labeled polystyrene particles.
Prof. Kathy Rowlen's lab at CU, Boulder. Supervisor: Michele Jacobson.

Research Skills:

Extensive molecular biology and biochemistry training: recombinant DNA, molecular cloning and mutagenesis; protein engineering and over-expression; protein modification and labeling; FPLC and HPLC purification; analysis of enzyme kinetics; fluorescent and Raman optical spectroscopy; DNA microarray fabrication; radiation training (H^3 and P^{32}); TEM and SEM electron microscopy; polymer surface chemistry.

Presented Research:

- 2008 **ASBMB Transcriptional Regulation by Chromatin and RNA Polymerase II Meeting**
Invited poster presentation on "Investigating General Transcription Factor complexes on DNA using total internal reflectance fluorescence protein binding microarrays".
- 2007 **Recent Advances and New Directions in Bio-Nanotechnology Symposium**
Invited talk on "Bio-inspired assembly of functional inorganic materials".

Awards/Honors:

- 2010-2012 **Tri Counties Blood Bank Santa Barbara Foundation Postdoctoral Fellowship**
Fellowship to support postdoctoral work on blood-based detection and treatments.
- 2009 **Chang Distinguished Alumni Award**
Award given for the Outstanding Talk in the Most Advanced category of presented research.
- 2008 **ScienceLine Outstanding Answerer Award in Physical Sciences**
Award given for excellence in answering science questions from students K-12.
- 2004-2005 **George and Joy Rathmann Fellowship**
Assists outstanding Ph.D. students in the Biomolecular Sciences and Engineering program.
- 2000-2004 **Kittridge Honors program**
Awarded to undergraduate students with excellent demonstrated academic or creative abilities, offering exclusive honors courses.
- 2002-2004 **Undergraduate Research Opportunities Program (UROP) Grants**
Awarded to undergraduate students with scholarly or creative proposals to work with a faculty sponsor.
- 2004 **Magna Cum Laude honors for B.A. at University of Colorado, Boulder**
- 2000-2004 **Dean's List, University of Colorado, Boulder**

Other Professional Experience & Interests:

Skilled Computer & Networking Technician

Self-taught computer programming, scripting, and web development experience. Comfortable with Linux, Unix, OS X, and Windows environments. Proficient with Microsoft Office, Adobe Photoshop & Illustrator, HTML & CSS web design, Wolfram Mathematica, and Linux server management.

GUMBI President, Treasurer, & Web manager 2008-2010

Led graduate student organization for the assistance of fellow students and to help communicate graduate student concerns to faculty. Organized finances, talked to students, and created website content.

President of UCSB Science Fiction & Fantasy Club 2006-2008

Led a group of graduate and undergraduate students interested in science fiction and fantasy novels and movies.