

EDUCATION

- Ph.D, School of Biological Sciences, University of East Anglia, Norwich, U.K. (1996-2001)
- B.Sc Honours Class 1 in Biochemistry, School of Biochemistry, University of Birmingham, Birmingham, U.K. (1993-1996)
- Allerton High School, Leeds, U.K. (1989-1993)

RESEARCH EXPERIENCE

C.H. Best Post Doctoral Fellow (May 2001-Present)

Supervisors: Dr. Jack F. Greenblatt and Dr. Andrew Emili, C.H. Best Institute, Banting and Best Department of Medical Research, University of Toronto, Canada

Project Title: Systematic Identification of Protein-Protein Interactions in *E. coli*

- Responsible for management of a high throughput bacterial proteomics project funded by Genome Canada
- Project focuses on the isolation of native protein complexes by affinity purification and the identification of constituent proteins by mass spectrometry (MALDI-ToF and LC-MS/MS)
- Supervision of two full time Research Technicians and co-op/undergraduate student(s)
- Mentorship of Greenblatt and Emili lab graduate students

Research Assistant / Post Doctoral Research Assistant (Dec 1999-June 2001)

Supervisor: Prof S J Ferguson, Department of Biochemistry, University of Oxford, Oxford, U.K.

Project Title: Spectroscopic and molecular characterization of periplasmic nitrate reductase from *Paracoccus Pantotrophus*

- Creation of an expression/mutagenesis system for the *P. pantotrophus* NapAB nitrate reductase
- Co-supervision of two graduate students working on related aspects of the project

Ph.D Student (Oct 1996-Nov 1999)

Supervisor: Professor D. J. Richardson, School of Biological Sciences, University of East Anglia, Norwich, UK

Thesis Title: "Expression and site-directed mutagenesis of the bacterial nitric oxide reductase from *Paracoccus denitrificans*."

- Project involved targeted mutagenesis, expression, purification and characterization of the nitric oxide reductase, a key enzyme in the detoxification of highly reactive nitric oxide during the process of denitrification
- Wild type and mutant proteins were characterized using biochemical and detailed spectroscopic methods
- Systems administrator for Richardson lab computing facilities
- Teaching assistant in undergraduate biochemistry and molecular biology lab classes

RELEVANT SCIENTIFIC SKILLS

- Knowledge of a wide range of molecular biology, microbiology and biochemical techniques with expertise in protein purification using conventional and affinity chromatography, electrophoresis and assay development
- Specific expertise in the purification and manipulation of membrane proteins
- Experience with *E. coli* based protein overproduction systems and expression systems used in broad host range bacterial species
- Analysis of MALDI-ToF and LC-MS/MS peptide mass spectra, and use of both Profound and SEQUEST database search algorithms
- Development of bioinformatics tools to help aid analysis of protein identifications from mass spectrometry data
- Advanced knowledge of Linux based operating systems
- Writing PERL and shell scripts to help with several different bioinformatics issues, including the summarization of BLAST reports and the storage and retrieval of large amounts of data from relational database management systems (eg. ORACLE, PostgreSQL) using SQL
- Experience in preparing operating grant proposals for Canadian and U.K funding bodies including Canadian Institutes of Health Research

PUBLICATIONS

“Interactions of the Escherichia coli Hydrogenase Biosynthetic Proteins: HybG Complex Formation”

Manuscript in preparation

Gareth Butland, Jie Wei Zhang, Jack F. Greenblatt, Andrew Emili, and Deborah B. Zamble

“Formation of a Distinctive Complex Between the Inducible Bacterial Lysine Decarboxylase and a Novel AAA+ ATPase” J. Biol. Chem. (Submitted Oct 2005) Jamie Snider, Michelle Lin, Sabulal Baby, Brian Cox, **Gareth Butland**, Jack Greenblatt Andrew Emili, Irina Gutsche and Walid A. Houry

“Protein-protein interactions along with focused follow up experiments provide evidence for the helicase activity of the DEAD protein.” J. Cell. Biochem. (Submitted Oct 2005), **Butland, G.**, Krogan, N.J., Xu, J., Yang, X.C., Yang, W.H., Aoki, H., Li, J.S., Krogan, N., Cagney, G., Menendez, J., Jessulat, M.G., Datta, N., Beattie, B.K., Ivanov, I.G., AbouHaidar, M.G., Emili, A., Greenblatt, J., Ganoza, M.C. and Golshani, A.

* “Interaction Network Containing Conserved and Essential Protein Complexes in *Escherichia coli*.” Nature (2005) Feb 3;433;531-7;

Gareth Butland, José Manuel Peregrín-Alvarez, Joyce Li, Wehong Yang, Xiaochun Yang, Veronica Canadien, Andrei Starostine, Dawn Richards, Bryan Beattie, Nevan Krogan, Michael Davey, John Parkinson, Jack Greenblatt and Andrew Emili

* Rated as "exceptional" by Faculty of 1000, <http://www.f1000biology.com/article/15690043/evaluation>

"A Role for SlyD in the *Escherichia coli* Hydrogenase Biosynthetic Pathway." Journal of Biological Chemistry (2005) Feb 11;280(6):4360-4366;

Jie Wei Zhang, **Gareth Butland**, Jack F. Greenblatt, Andrew Emili and Deborah B. Zamble

"Sequential Peptide Affinity (SPA) System for the Identification of Mammalian and Bacterial Protein Complexes." J Proteome Res. (2004) May-Jun;3(3):463-8;

Mahel Zeghouf, Joyce Li, **Gareth Butland**, Anna Borkowska, Veronica Canadien, Dawn Richards, Bryan Beattie, Andrew Emili, and Jack F. Greenblatt

"Two conserved glutamates in the bacterial nitric oxide reductase are essential for activity but not assembly of the enzyme." Journal of Bacteriology (2001) Jan;183(1):189-99

Butland G., Spiro S., Watmough N.J. and Richardson D.J.

"A low-redox potential haem in the dinuclear centre of bacterial nitric oxide reductase: implications for the evolution of energy conserving haem-copper oxidases." Biochemistry (1999) Oct 19; 38(42):13780-6

Gronberg, K.L., Roldan, M.D., Prior, L., **Butland, G.**, Cheesman, M.R., Richardson, D.J., Spiro, S., Thomson, A.J and Watmough, N.J.

"Nitric oxide in bacteria: synthesis and consumption." Biochim Biophys Acta (1999) May 5;1411(2-3):456-74

Watmough, N.J., **Butland, G.**, Cheesman, M.R., Moir, J.W., Richardson, D.J., Spiro, S.

CONFERENCE PRESENTATIONS

- TIGR Microbial Genomes Conference, Halifax, Nova Scotia, April 13th-16th 2005, Poster presentation
- International *E. coli* Alliance Meeting, Banff, Alberta, June 23rd-27th 2004, Abstract selected for oral presentation
- 4th Annual Meeting of the Canadian Proteomics Initiative, Montreal, Quebec, May 15th-18th 2004, Abstract selected for oral presentation
- The 2003 Molecular Genetics of Bacteria and Phages Meeting, Madison, Wisconsin, August 5th-10th 2003, Abstract selected for oral presentation
- Protein Engineering Network Centres of Excellence (PENCE) Annual General Meetings, 2002-2004, Poster presentations
- 5th UK-Holland Nitrogen Cycle Meeting, Amsterdam, The Netherlands, September 9th-11th, 1999, Abstract selected for oral presentation
- 4th UK-Holland Nitrogen Cycle Meeting, Norwich, UK, September 3rd-5th 1998, Poster Presentation
- Biochemical Society of Great Britain, Bioenergetics Meeting, Southampton, UK, April 1998, Abstract selected for oral presentation
- 3rd UK-Holland Nitrogen Cycle Meeting, Delft, The Netherlands, 4th-6th September 1997, Abstract selected for oral presentation

REFEREES

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