

Stéphanie M. Bernard

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Education:

PhD Rothamsted Research (UK) and School of Biological Sciences, Lancaster University (UK) 2002-2005
Advisors: Dimah Z. Habash, Christine H. Foyer and Brian G. Forde

Maitrise (Master's degree by instruction; with honours) Nantes University (France), engineering school in Chemistry-Biology and Rothamsted Research (UK). 2000-2001

Licence (Bachelor's degree; with honours) Nantes University (France), engineering school in Chemistry-Biology 1999-2000

Professional experiences:

Postdoctoral fellow, Ecology department, Lawrence Berkeley National Laboratory. September 2005- present
An annual grassland mesocosm exploration of scaling from genomes to ecosystem function

This multidisciplinary project, funded by DOE, investigates the coordinated responses to climate change of soil microorganisms and plants from a Californian annual grassland ecosystem with the aim of scaling from gene to ecosystem. My studies have involved cloning the genes that are associated with plant carbon and nitrogen metabolism in *Avena barbata* and studying their expression in both the roots and leaves of plants grown under differing climatic conditions.

Graduate Studies, Crop Performance and Improvement division, Rothamsted Research (UK) and School of Biological sciences, Lancaster University. March 2002- September 2005

Developing wheat with enhanced nitrogen use efficiency towards sustainable system of production

This project was funded by the EU-FV and involved two main approaches; the identification of quantitative traits loci for nitrogen use efficiency and the genetic engineering of wheat. I used the particle bombardment to manipulate the expression of cytosolic glutamine synthetase (GS) in wheat. As part of this project, I also analyse the GS genes transcript abundance in the leaves during senescence and identified two genes that are involved in nitrogen remobilisation in wheat.

Research assistant, Crop Performance and Improvement division, Rothamsted Research (UK). March 2001- February 2002

Oxidative stress

While working with Christine H. Foyer at Rothamsted Research (UK), I was involved in two projects on oxidative stress. The first project involved the analysis of the transcripts of two antioxidant enzymes, ascorbate peroxidase and catalase, in drought-stressed wheat and *Arabidopsis thaliana* (wild type and mutant *Vtc-1*) and suggested a role for ascorbate as a signalling molecule in plants. The second project was a EU funded project entitled 'senescence and oxidative stress' that investigated the role of oxidative stress in the senescence of pea (*Pisum sativum*) nodules.

Grant and Awards:

2007- Divisional Program Development Grant: 'Genomic Basis of Plant Response to Soil Heterogeneity' (\$20k)

2006- Prize for best presentation awarded at the Rank Prize symposium 'Can We Improve the Utilisation of Nitrogen in Cereals?'

Current Membership in Professional Societies:

2005- American Society of Plant Biologists

Published articles:

1. **Bernard SM**, Blom Møller AL, Dionisio G, Jahn TP, Baudo M, Lopes MS, Tercé-Laforgue T, Foyer CH, Parry M, Forde BG, Araus JL, Hirel B, Schjoerring JK and Habash DZ. Gene expression and function of glutamine synthetase isozymes in wheat (*Triticum aestivum* L.). Submitted to Plant molecular biology.
2. Habash D, **Bernard S**, Schondelmaier J, Weyen J and Quarrie S. (2007) The genetics of nitrogen use in hexaploid wheat: N utilisation, development and yield. Theoretical and applied genetics 114(3): 403-419.
3. Groten K, Dutilleul C, van Heerden PDR, Vanacker H, **Bernard S**, Finkemeier I, Dietz K-J, Römer P and Foyer CH. (2006) Redox regulation of peroxiredoxin and proteinases by ascorbate and thiols during pea root nodule senescence. FEBS Letters 580(5): 1269-1276.
4. Groten K, Vanacker H, Dutilleul C, Bastian F, **Bernard S**, Carzaniga R, Foyer CH. (2005) The roles of redox processes in pea nodule development and senescence. Plant Cell Environment. 28 (10): 1293-1304.
5. Luna CM, Pastori GM, Driscoll S, Groten K, **Bernard S**, and Foyer CH. (2005) Drought controls on H₂O₂ accumulation, catalase (CAT) activity and *CAT* gene expression in wheat. J. Exp. Bot. 56 (411): 417-423.
6. Pastori GM, Kiddle G, Antoniow J, **Bernard S**, Veljovic-Jovanovic S, Verrier PJ, Noctor G, Foyer CH. (2003) Leaf vitamin C contents modulate plant defense transcripts and regulate genes that control development through hormone signaling. Plant Cell 15 (4): 939-951.
7. Kiddle G, Pastori GM, **Bernard S**, Pignocchi C, Antoniow J, Verrier PJ, Foyer CH. (2003) Effects of leaf ascorbate content on defense and photosynthesis gene expression in *Arabidopsis thaliana*. Antioxidants and Redox Signaling. 5 (1): 23-32.

Published abstracts:

1. Linking the response of annual grasslands to warming and altered rainfall across scales of gene expression, species, and ecosystem. (2007) Torn MS, **Bernard SM**, St.Clair SB, Fischer ML, Hopkins FM, Placella SA, Castanha C, Sudderth E, Herman DJ, Salve R, Ackerly DD and Firestone MK. AGU, San Francisco, CA.
2. A molecular analysis of plant response to global climate change in an annual grassland (2007). **Bernard SM**, StClair S, Placella S, Firestone M, Salve R, Ackerly DD and Andersen GL. Ecological Society of America, annual meeting, San Jose, CA.
3. Annual grassland response to altered precipitation and temperature: genes, species, and ecosystem (2007). Torn MST, St.Clair SB, Ackerly DD, Andersen GL, **Bernard SM**, Brodie EL, Castanha C, Firestone MK, Fischer MK, Hopkins FH, Placella SA and Salve R. Ecological Society of America, annual meeting, San Jose, CA.
4. Connecting soil microbial N-transformations to plant N-processing (2007). Firestone MK, Placella SA, **Bernard SM**, Herman DJ, Brodie EL, Andersen GL, St Clair S and Ackerly DD. Ecological Society of America, annual meeting, San Jose, CA.
5. 16S rRNA microarray analysis of shifts in microbial community composition in response to altered soil moisture and its implication for changes in nutrient cycling. (2007) Brodie EL, **Bernard SM**, StClair SB, Placella SA, Herman DJ, Salve R, Torn MS, Ackerly DD, Firestone MK and Andersen GL. Ecological Society of America, annual meeting, San Jose, CA.
6. A molecular approach to understanding plant response to global climate change in a Californian grassland ecosystem (2007). **Bernard SM**, St. Clair S, Placella S, Firestone M, Torn MST, Ackerly DD and Andersen GL. Plant biology and Botany- Joint congress, Chicago, IL.
7. The genetics of nitrogen use in wheat- the role of leaf nitrogen metabolism. (2007) Habash D, **Bernard SM**, Schondelmaier J, Weyen J and Quarrie SA. Nitrogen symposium, Lancaster, UK.
8. A molecular approach to understanding plant response to global climate change in a Californian grassland. **Bernard S.M.**, Ball I., St.Clair S., Placella S., Firestone M., Torn M.S., Ackerly D. and Andersen G.L. Ecosystem. Gene in Ecology, Ecology in Genes. Kansas State University, Kansas City, Missouri. 2007.
9. Roles and regulation of glutamine synthetase in wheat. **Bernard S**, Dionisio G, Schjoerring JK, Foyer CH and Habash DZ. (2006) The Rank Prize fund, Mini-symposium on Can we improve the utilization of Nitrogen in cereals? Grasmere, UK.

10. Manipulating the expression of cytosolic glutamine synthetase in wheat of four genetic background. **Bernard S**, Weyen J, Foyer CH and Habash D (2004). 7th International Symposium on Inorganic Nitrogen Assimilation in Plants: From the Genome to the Agro-Ecosystem, Wageningen, The Netherlands.
11. Nitrogen use in wheat: a genetic approach. Habash D, **Bernard S**, Quarrie S, Schondelmaier J and Weyen J. (2004) 7th International Symposium on Inorganic Nitrogen Assimilation in Plants: From the Genome to the Agro-Ecosystem, Wageningen, The Netherlands.
12. From the big bang to the global economy: putting C/N interactions into perspective. Karin Groten and **Stéphanie Bernard**. Society for Experimental Biology Bulletin. July 2003
13. Manipulating the expression of cytosolic glutamine synthetase in wheat of four genetic background. **Bernard S**, West J, Foyer C and Habash D. (2003) Society for Experimental Biology, Annual Main Meeting, Southampton, UK.
14. Can our knowledge of glutamine synthetase lead to wheat with improved nitrogen use efficiency? Habash DZ, Quarrie S, **Bernard S** and Foyer CH. (2002) Association of Applied Biologist, Genotype-Phenotype: narrowing the gaps, Cirencester, UK.
15. Vitamin C contents modulate defence and plant development via transcriptional regulation. Foyer CH, Pastori GM, Kiddle G, Antoniw J, **Bernard S**, Veljovic-Jovanovic S, Noctor G, Verrier PJ (2002) Free Radical Biology and Medicine 33: 448 Suppl. 1 2002

Additional skills:

Language: fluent in French and English

Students: I have supervised undergraduate students (5) hired to assist with laboratory and greenhouses experiments at UC Berkeley.

Journal Reviewer: New Phytologist (2007)

References:

Dr. Gary L. Andersen, Earth Sciences Division, Lawrence Berkeley National Laboratory, 1, Cyclotron Road, Berkeley CA 94720.

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Dr. David D. Ackerly, Department of Integrative Biology, University of California, Berkeley, 3060 Valley Life Science Building, University of California, Berkeley CA 94720-3140.

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Dr. Dimah Z. Habash, Plant Science Department, Rothamsted Research, West Common, Harpenden, Hertfordshire, AL5 2JQ (UK).

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Prof. Christine H. Foyer, School of Agriculture, Food and Rural Development, Agriculture Building, The University of Newcastle upon Tyne, Newcastle upon Tyne, NE1 7RU (UK)

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