

SALLY BURR

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Determined, successful postdoctoral Researcher with a strong interest in the plant cell wall, polyphenols and secondary metabolism and wide experience in various areas of biochemistry, chemistry and molecular biology.

KEY SKILLS

Biochemistry

- Plant cell wall polysaccharides; Plant metabolism; Enzyme assays; *In vivo* radio-labelling; Plant cell suspension culture (maize); Plant cultivation (*Arabidopsis thaliana* and *Medicago truncatula*); Plant phenotypic / biochemical mutant screens; Bacterial culture (*E.coli* and *Agrobacterium*); Plant-bacterial interactions; Fluorescence and light microscopy. Confocal laser microscopy : Fluorescence Recovery After Photo-bleaching (FRAP). Rheometry; Scanning electron microscopy.

Chemistry

- Analytical chemistry (method development); Chromatography (HPLC, GC-MS (derivatisation, deuterium labelling) GPC, CE and TLC); Spectroscopy (including UV-vis, IR, ¹H-NMR and MS); Ferulic acid chemistry; Enzymology; Oxidation; Organic synthesis; Nucleic acid chemistry; Carbohydrate chemistry; Photochemistry; Diazo chemistry.

Molecular Biology

- Sub-cellular fractionation; Protein separation by PAGE and HPLC; MS protein analysis; Protein blotting; ELISA; DNA cloning in plasmid, transformation and protein expression in *E.coli*; PCR; DNA sequencing; mRNA isolation; bioinformatics (BLAST, EMBL database).

IT Skills

- Macro writing in Agilent Chemstation; R GUI (statistical modelling); SigmaPlot; RasMol and Protein Explorer; IsisDraw32; Beginner in PERL; Microsoft Office; OpenOffice.

Career History

INRA : UMR-BIA Nantes (Estelle Bonnin) and UMR-FARE Reims (Brigitte Chabbert) **Postdoctoral Research position**

June 2011-June 2012

- **Enzydam** was a joint project between Nantes and Reims to study the action of plant cell wall enzymes in a gel model system based on pectin / cellulose / xyloglucan or cellulose / xylan / lignin. It included:
 - Dynamic changes in viscoelastic properties of xylan or pectin-based gels (rheometry).
 - Dynamic changes in degree and pattern of pectin methylation by pectin methylesterase action (HPAEC of oligogalacturonic acid and IR spectroscopy).
 - Arabinoxylan degradation by xylanases and alkali (Kidby Davidson assay and cylindrical gel digestion).
 - Xylan/ cellulose gel structure (scanning electron microscopy).
 - Enzyme movement in arabinoxylan gels (FRAP).
 - Two papers are now in preparation, and a poster has been presented at a Lignobiotech 2 in Fukuoka, Japan (14-17th October 2012).

CNRS, Université Claude Bernard Lyon 1

UMR5557 Laboratoire Ecologie Microbienne (Xavier Nesme and Gilles Comte)

Postdoctoral Research position

Jan-Dec 2009.

- Studied effect of *Agrobacterium tumefaciens* and other rhizospheric bacteria on the metabolome of the legume model plant *Medicago truncatula*.
- Searched for plant compounds which are known substrates for genes specific to a particular *Agrobacterium* species, which constitute its "ecological niche".
- Methodology included HPLC and statistical analysis (ANOVA, PCA) to identify plant metabolites involved in interaction between the bacterium and the roots of the plant.

University of Edinburgh

BBSRC-funded project in the Edinburgh Cell Wall Group (Stephen C. Fry)

Postdoctoral Research Fellowship

2005-2008

- Studied the role of ferulic acid, a lignin precursor, in the formation of covalent cross-links between polysaccharides in maize cell walls.
- Used radiolabel feeding to plant cell suspension cultures, gel permeation chromatography, HPLC, PC, TLC and enzyme assays.
- Uncovered evidence for a maize peroxidase specific for the cross-linking reaction and for the formation of alkali-stable (non-ester) cross-links.
- Wrote and published two papers, presented results at three international conferences .
- Assisted in the supervision of Honours final year project students in the lab.

University of Wales Bangor

BBSRC-funded metabolomics project (Mark Hooks and Deri Tomos)

Postdoctoral Research Associate

2003-2005

- Examined carbon flow through acetate metabolism into carbohydrate, protein and lipids in *Arabidopsis thaliana* wild-type and fluoroacetate-resistant mutant strains.
- Fed radiolabelled acetate to *Arabidopsis* seedlings, and followed up with analysis of metabolic fractions. Phenotypic and biochemical mutant screens of *Arabidopsis* seedlings, enzyme assays and capillary zone electrophoresis were also used.
- A paper has been published in *Biochemical Journal*.

MRC Dunn Human Nutrition Unit, Cambridge

Research Assistant

2001-2003

- Project part of UK Flexiscope Screening Trial funded by the Food Standards Agency.
- Worked in the Diet and Cancer Group led by Dr Sheila Bingham.
- Collaboration with Professor David Shuker (Open University, Milton Keynes).
- Used immunoslot-blot ELISA-based assay to malondialdehyde-deoxyguanosine (M1-dG) a potential biomarker for colorectal cancer, in DNA extracted from human blood samples.
- Coauthored a paper on the topic by Sharon A. Moore, in *Analytical Biochemistry*.

Education

University of Salford

Biochemistry PhD

1995-2001

- Supervised by Dr Emrys Thomas.
- Studied the DNA photocleaving activities of *N*-hydroxyethyl-Berenil and its photoproduct, 4-amidinobenzenediazonium by HPLC, GC-MS, plasmid nick assay, radioactive isotope-labelling and comet assay.
- Toxicity testing were done with Dr John Butler at the Paterson Institute, Manchester, and DNA sequencing and sequence specific DNA cleavage studies were done with Dr John Hartley at the Department of Oncology, University College London Medical School.
- A paper was published in *Tetrahedron Letters* (see appendix 1).
- Worked as part-time demonstrator in biochemistry practical classes 1998 and 1999.

University of Nottingham

BSc Hons. Biochemistry & Biol. Chem. 2:1

1992-1995

- Final year project 1) Synthesis of Heritainin (a terpenoid natural product). Organic synthesis, proton-NMR.
- Final year project 2) Analysing steroid hormones in blood plasma by GC-MS. Derivatisation, deuterium labelling.

Aylesbury High School, Bucks

1986-1992

- 3 A-levels: Biology A, Chemistry B, Geography B.
- 9 GCSEs: 7 As, 2 Bs.

Professional Development

- Five months lessons at Alliance Française, Lyon, reaching B2N1 (higher intermediate level).
- Two week intensive French course at Institute Française, London.
- Making Funding Applications, University of Edinburgh (2007).
- Techniques in Molecular Biology: Proteins Workshop, University of Hatfield (2003).
- Introductory Statistics, University of Cambridge Centre for Applied Medical Statistics (2002).
- Techniques in Molecular Biology: Nucleic Acids Workshop, University of Hatfield (2002).

Personal

- D.O.B.: 23.9.73
- Full, clean driving licence (UK)
- Status: Single
- Member of Groupe Polyphénols.

Interests

- Wing Chun Kung Fu (I got to green belt level before I had to leave for France).
 - Reading in French and Spanish.
 - Outdoor sports (kayaking and mountain biking).
 - Clarinet and piano.
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Publications and Conferences

- G. Paes, S. Burr, M.-B. Saad, M. Molinari, V. Aguié-Béghin, B. Chabbert, Modeling progression of fluorescent probes in bio-inspired lignocellulosic assemblies. (Submitted to *Macromolecules*). A second paper is in preparation.
- S. A. Moore, O. Xeniou, Z. T. Zeng, E. Humphreys, S. Burr, E. Gottschalg, S. A. Bingham, D. E.G. Shuker (2010) *Optimizing immunoslot blot assays and application to low DNA adduct levels using an amplification approach*. *Anal Biochem* 403(1-2):7.
- S. J. Burr, S. C. Fry. (2009) *Feruloylated Arabinoxylans Are Oxidatively Cross-Linked by Extracellular Maize Peroxidase but Not by Horseradish Peroxidase*. *Mol. Plant*. 2 (5) 883 – 892.
- S. J. Burr, S. C. Fry. (2009) *Extracellular cross-linking of maize arabinoxylans by oxidation of feruloyl esters to form oligoferuloyl esters and ether-like bonds*. *Plant J*. 58 (4) 554-567
- M. A. Hooks, J. E. Turner, E. C. Murphy, K. A. Johnston, S. Burr & S. Jarosławski. (2007) *The Arabidopsis ALDP protein homologue COMATOSE is instrumental in peroxisomal acetate metabolism*, *Biochem. J.* 406, 399–406.
- S. J. Burr, A. Mselati & E. W. Thomas, (2003), *Photochemical DNA Cleavage by a Berenil analogue*. *Tetrahedron Letters*, 44, 7307-7309.
- S. J. Burr, 2001, PhD Thesis: *Studies on DNA Cleaving Agents*. University of Salford.
- Another paper, relating to my work in Lyon, is in preparation.

- A poster has been presented at Lignobiotech 2 in Fukuoka, Japan (14 - 17 october 2012): *Bio-inspired lignocellulose systems reveal parameters influencing the mobility of fluorescent probes in plant secondary cell walls*. G. Paes, S.J. Burr, M.-B. Estephan, M. Molinari, V. Aguié-Béghin & B. Chabbert.
- Paës G, Burr S, Chabbert B. *Oxidative enzymes as essential tools for preparing bio-inspired models of plant secondary cell walls*. OxiZymes, 16 - 19 September 2012, Marseille, France (oral communication by G. Paës)
- Gave a talk at the 24th International Conference on Polyphenols 2008: *A cell-free system for studying ferulate cross-linking in maize cell walls*. S. J. Burr & S. C. Fry.
- Presented a poster at the 11th Cell Wall Meeting, Copenhagen 2007: *Feruloyl cross-linking in soluble extracellular polysaccharides of maize: ester versus ether bonds*. S. J. Burr & S. C. Fry.
- Gave a talk at the 23rd International Conference on Polyphenols 2006: *Ferulic Acid-Mediated Cross-linking in Maize Cell Walls*. S. J. Burr & S. C. Fry.
- Presented a poster at the 15th Scottish Cell Wall Group Meeting 2005: *Cross-linking of Polysaccharides in the Maize Cell Wall*. S. J. Burr
- Attended Plant Science Wales 2003, Aberystwyth

Referees

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