

CV _ Dr Laurence V. BINDSCHEDLER

Research interests in plant proteomics

I have joined Prof. Cramer team at the University of Reading, in 2005 with a PhD in molecular plant pathology, and extensive post-doctoral experience in molecular plant biology/pathology. Access to mass spectrometry instrumentation gave me the opportunity to master, and apply proteomics techniques to research relevant to plant biology. In particular, I have developed and established mass spectrometric techniques for the quantitative proteomics analysis in plants using ¹⁵N metabolic labelling.

As a plant biologist, I am, in general terms, interested in understanding interactions between plants and pathogens at the molecular and proteomic levels. Thanks to BBSRC funding, I am now investigating the proteome of an economically important barley pathogen *Blumeria graminis*. These data have been proven useful to annotate the genome of this newly sequenced biotrophic fungus and lead to the discovery of species specific protein effectors which are involved in the infection process of barley. These effectors are further investigated in order to understand their novel protein structure and to search for barley protein partners.

Present Appointment

2005 - 2009 Senior Research assistant Department of Chemistry, University of Reading (UK).

Employment History

2005 - 2009 Senior Research assistant The BioCentre, School of Biological Sciences University of Reading (UK).

2005 Research assistant, Department of Biological Sciences, Imperial college, London (UK).

2000 –2005 Research assistant, Department of Biological Sciences, Royal Holloway University of London, Egham (UK)

1998 - 2000 Research assistant, Department of Biology and Biochemistry, University of Bath (UK).

1997 – 1998 Research assistant, (**Personal Fellowship** from Fonds National de la Recherche Scientifique Suisse) Institut de Biotechnologie des Plantes, Université Paris Sud, Orsay (France).

1993 – 1997 Postgraduate Research and Teaching Assistant, Institut de Biologie Végétale, Université de Fribourg (CH).

1991 – 1993 Postgraduate Research and Teaching Assistant. Laboratoire de Phytogénétique Cellulaire, Université de Lausanne (CH).

1990 - 1991 Research Assistant (Summer Placements). Institut de Physiologie Humaine and Laboratoire de Phytogénétique Cellulaire, Université de Lausanne (CH).

Qualifications

1997 **PhD in Natural Sciences** University of Fribourg (CH).

1993 **MSc. Plant Biology** University of Lausanne (CH)

1987 **Baccalaureate (Sciences)** Gymnase Cantonal Burier, La Tour-de-Peilz (CH).

Professional memberships

Society of Experimental Biology (SEB), British Society of Proteome Research (BSPR), American Society for Mass Spectrometry (ASMS), International Society for Molecular Plant Microbe Interaction (IS-MPMI).

Publications

1. **Bindschedler LV**, McGuffin LJ, Burgis TA, Spanu PD, Cramer R. **2011**. Proteogenomics and *in silico* structural and functional annotation of the barley powdery mildew *Blumeria graminis* f. sp. *hordei*. Methods. *In Press*.
2. **Bindschedler LV**, Cramer R. **2011**. Fully automated software solution for protein quantitation by global metabolic labeling with stable isotopes. Rapid Commun Mass Spectrom. 25: 1461-71.
3. **Bindschedler LV**, Cramer R. **2011**. Quantitative Plant Proteomics. Proteomics 11: 756-775.
4. **Bindschedler LV**, Cramer R. Quantitative Plant Proteomics Using Hydroponic Isotope Labeling of Entire Plants (HILEP). In: Sample Preparation for Biological Mass Spectrometry. Ivanov A. and Lazarev A. Eds. Springer Publisher. *In Press*.
5. Koroleva, OA. **Bindschedler LV**. Efficient strategies for analysis of low abundant proteins in plant proteomics. In: Sample Preparation for Biological Mass Spectrometry. Ivanov A. and Lazarev A. Eds. Springer Publisher. *In Press*.
6. **Bindschedler LV**, Mills DJS, Cramer R. Hydroponic Isotope Labeling of Entire Plants (HILEP) and High Performance Mass Spectrometry For Quantitative Plant Proteomics. *Submitted*.
7. PD Spanu, JC Abbott, J Amselem, TA Burgis, DM Soanes, K Stüber, E Ver Loren van Themaat, JKM Brown, SA Butcher, SJ Gurr, MH Lebrun, CJ Ridout, P Schulze-Lefert, NJ Talbot, N Ahmadinejad, C Ametz, GR Barton, M Benjdia, P Bidzinski, **LV Bindschedler**, et al. **2010**. Genome expansion 1 and gene loss in powdery mildew fungi reveal functional tradeoffs in extreme parasitism. Science 330:1343-1346.
8. **Bindschedler LV**, Burgis TA, Mills DJS, Ho JTC, Cramer R, Spanu PD. **2009**. In Planta Proteomics and Proteogenomics of the biotrophic barley fungal pathogen *Blumeria graminis* f.sp. *hordei*. Mol Cell Proteomics 8: 2368-81.
9. Boschetti E, **Bindschedler L**, Tang C, Fasoli E, and Righetti PG. **2009**. Combinatorial peptide ligand libraries and plant proteomics: a winning strategy at a price. J Chromatogr A. 1216:1215-22.
10. Millar DJ, Whitelegge JP, **Bindschedler LV**, Rayon C, Boudet AM, Bolwell GP. **2009**. The cell wall and secretory proteome of a tobacco cell line secreting secondary wall. Proteomics 9:2355-72.
11. **Bindschedler LV**, Palmblad M, Cramer R. **2008**. Hydroponic isotope labelling of entire plants (HILEP) for quantitative plant proteomics. Phytochemistry 69:1962-72.
12. Palmblad M, Mills DJ, **Bindschedler LV**. **2008**. Heat Shock Response in *A. thaliana* Explored by Multiplexed Quantitative Proteomics Using Differential Metabolic Labeling. Journal of Proteome Research 7:780-5
13. **Bindschedler LV**, Tuerck J, Maunders M, Ruel K, Petit-Conil M, Danoun S, Boudet AM, Joseleau JP, Bolwell GP. **2007**. Modification of hemicellulose content by antisense down-regulation of UDP-glucuronate decarboxylase in tobacco and its consequence for cellulose extractability. Phytochemistry 68: 2635-48.
14. Palmblad M, **Bindschedler LV**, Cramer R. **2007**. Quantitative Proteomics Using Uniform ¹⁵N-labeling, Mascot and the Trans-Proteomic Pipeline. Proteomics 7:3462-9.
15. Palmblad M, Mills DJ, **Bindschedler LV**, Cramer R. **2007**. Chromatographic Alignment of LC-MS and LC-MS/MS Datasets by Genetic Algorithm Feature Extraction. J.Am. Soc. for Mass Spectrom. 18:1835-43.
16. Palmblad M., **Bindschedler LV**, Cramer R. **2006**. Automatic internal calibration in liquid chromatography/Fourier transform ion cyclotron resonance mass spectrometry of protein digests. Rapid Commun Mass Spectrom: 20: 3076-3080.
17. **Bindschedler LV**, Dewdney J, Blee KA, Stone JM, Asai T, Plotnikov J, Denoux C, Hayes T, Gerrish C, Davies DR, Ausubel FM, Bolwell GP. **2006**. Peroxidase-dependent apoplastic oxidative burst in Arabidopsis required for pathogen resistance. Plant J. 47: 851-863.

18. **Bindschedler LV**, Whitelegge J, Millar D., Trethowan J, Bolwell GP. **2006**. A two component chitin-binding protein from French bean – association of proline-rich protein with a cysteine-rich polypeptide. *FEBS Lett.* 580: 1541-1546.
19. Davies DR, **Bindschedler LV**, Strickland TS, Bolwell GP. **2006**. Production of reactive oxygen species in *Arabidopsis thaliana* cell suspension cultures in response to an elicitor from *Fusarium oxysporum*: implications for basal resistance. *J Exp. Bot.* 57: 1817-1827.
20. **Bindschedler LV**, Wheatley E, Gay E, Cole J, Cottage A, Bolwell GP. **2005**. Characterisation and regulation of the pathway from UDP-glucose to UDP-xylose in differentiating tobacco tissue. *Plant Molecular Biology* 5: 285-301.
21. **Bindschedler L**, Sanchez P, Dunn S., Mikan J, Thangavelu, M, Clarkson JM, Cooper RM. **2003**. Deletion of the SNP1 trypsin protease from *Stagonospora nodorum* reveals another major protease expressed during infection. *Fungal Genetics and Biology*, 38: 43-53.
22. Bolwell GP, **Bindschedler LV**, Blee KA, Butt, VS, Davies DR, Gardner SL, Gerrish C, Minibayeva F. **2002**. The apoplastic oxidative burst in response to biotic stress in plants: a three-component system. *Journal of Experimental Botany (Antioxidants and reactive oxygen species in plants special issue)* 53, 1367-1376.
23. **Bindschedler LV**, Minibayeva F, Gardner SL, Gerrish C, Davies DR, Bolwell GP. **2001**. Early signalling events in the apoplastic oxidative burst in suspension cultured French bean cells involve cAMP and Ca²⁺. *New Phytologist* 151:185-194.
24. Carlile A, **Bindschedler L**, Bailey AM, Bowyer P, Clarkson JM, Cooper RM. **2000**. Characterisation of SNP1, a cell wall degrading trypsin, produced during infection by *Stagonospora nodorum*. *Molecular Plant-Microbe Interaction* 13: 538-550.
25. **Vallélian-Bindschedler L**, Möisinger E, Métraux JP, Schweizer P. **1998**. Structure, expression and localization of a germin-like protein in barley (*Hordeum vulgare* L.) that is insolubilized in stressed leaves. *Plant Molecular Biology* 37: 297-308.
26. **Vallélian-Bindschedler L**, Métraux JP, Schweizer P. **1998**. Salicylic acid accumulation in barley is pathogen specific but not required for defence-gene activation. *Molecular Plant-Microbe Interactions* 11:702-705
27. **Vallélian-Bindschedler L**, Schweizer P, Möisinger E, Métraux JP. **1998**. Heat-induced resistance in barley to powdery mildew (*Blumeria graminis* f. sp. hordei) is associated with a burst of active oxygen species. *Physiological and Molecular Plant Pathology* 52: 185-199.
28. Schweizer P, **Vallélian-Bindschedler L**, Möisinger E. **1995**. Heat induced resistance in barley to the powdery mildew fungus *Erysiphe graminis* f.sp. *hordei*. *Physiological and Molecular Plant Pathology* 47: 51-66.
29. Schweizer P, **Bindschedler L**, Meuwly P, Mölders W, Coquoz JL, Buchala A, Métraux JP. **1995**. Approaches to identify genes for resistance in plants. In: Ragsdale NN, Kearny PC, Plimmer JR eds. 8th International Congress of Pesticide Chemistry. Option 2000 Washington DC: The American Chemical Society, 225-235.