

BIOGRAPHICAL SKETCH

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NAME Christoph H. Borchers	POSITION TITLE Director of UVic Genome BC Proteomics Centre Associate Professor		
eRA COMMONS USER NAME CBORCHERS			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	YEAR(s)	FIELD OF STUDY
Natural Science-Tech. Acad., Isny, Germany	CTA	1982	Chemistry
Natural Science-Tech. Acad., Isny, Germany	Dip. Engineer	1986	Chemical Engineering
Univ. of Konstanz, Konstanz, Germany	B.S./M.S.	1992	Chemistry
Univ. of Konstanz, Konstanz, Germany	Ph.D.	1996	Anal. Chem./Biochem.
NIEHS, RTP, NC	Post-doc	1997-1999	Anal. Chem./Biochem.

POSITIONS:

1986-1988 Scientific Co-worker, Gesellschaft fuer Strahlen-und Umweltforschung, Munich, Germany
 1991-1996 Scientific Assist. in Research & Teaching, Fac. of Chemistry, Univ. of Konstanz, Germany
 1997,1998, 1999 Fellow (NIH Visiting Program), Lab. of Struc. Bio., Mass Spec. Group, NIEHS, RTP, NC
 1997-1998 Guest Research, Lab. of Struc. Bio., Mass Spec. Group, NIEHS, RTP, NC
 1999-2000 Research Fellow, Lab. of Struc. Bio., Mass Spec. Group, NIEHS, RTP, NC
 2000-2001 Staff Scientist, Lab. of Struc. Bio., Mass Spec. Group, NIEHS, RTP, NC
 2001-2006 Faculty Director of the Proteomics Core Facility, UNC-CH, Chapel Hill, NC, since 07/2005 UNC-Duke Michael Hooker Proteomics Center
 2001-2006 Assist. Professor, Dept. of Biochemistry & Biophysics, UNC-CH, Chapel Hill, NC
 2002-2006 Faculty Member of the Toxicology Curriculum and Lineberger Comprehensive Cancer Center, UNC-CH, Chapel Hill, NC
 2004-2006 Director of the Biomarker Core Facilities at the UNC Center of Environmental Health and Susceptibility
 2006-present Associate Professor with Tenure, Biochemistry and Microbiology Department, UVic, Victoria, BC
 2006-present Director UVic Genome BC Proteomics Centre

HONORS:

Academic Scholarship for Engineering College **8/82-7/86**; M.S. Honors graduation; **05/92**, Ph.D. Honors graduation, summa cum laude **11/96**; Research Stipend from the German Research Association (DFG) - Guest Researcher at NIEHS **5/97-1/98**; Award as a Visiting Fellow in the NIH Visiting Program, Invited for the Scientific Director Seminar at NIEHS **07/00**; Consultant and Editorial Advisory Board for Cambridge Healthtech Institute; Member of the panel review committee for SBIR proposals at NSF **04/02, 03/03, 04/04**; UNC Center for AIDS Research Developmental Award **06/02**; UNC LCCC Seed Award **01/03**; Member of the Editorial Board of "Expert Review of Proteomics; CIHR study section **11/06**; NIH study section **02/08**

PUBLICATIONS (2005-2008 listed in reverse chronological order, total 63 peer-reviewed papers):

Ouvry-Patat, S.A., Torres, M.P., Quek, H., Gelfand, C.A., Schroeder, G.K., Han, J., Elliott, M., Dryhurst, D., Ausio, J., Wolfenden R., **Borchers, C.H.**, Free-Flow Electrophoresis for Top-Down Proteomics by Fourier Transform Ion Cyclotron Resonance Mass Spectrometry *Proteomics*, accepted for publication (2008)

Han, J., Danell, R.M., Patel, P.R., Gumerov, D.R., Scarlett, C.O., Speir, J.P., Parker, C.E., Rusyn, I., Zeisel, S., **Borchers, C.H.**, Towards High Throughput Metabolomics using Ultrahigh Field Fourier Transform Ion Cyclotron Resonance Mass Spectrometry *Metabolomics*, accepted for publication (2008)

Jiang, J., Parker, C.E., Fuller, J.R., Kawula, T.H., **Borchers C.H.**, An immunoaffinity tandem mass spectrometry (iMALDI) assay for detection of *Francisella tularensis*. *Analytica Chimica Acta*, 605: 70 -79 (2007)

Jiang, J., Parker C.E., Hoadley, K.A., Perou, C.M., **Borchers C.H.**, Development of an Immuno Tandem Mass Spectrometry (iMALDI) Assay for EGFR Diagnosis. *Proteomics Clin. Appl.*, 1: 1651 - 1659 (2007)

- McMorran B.J., Ouvry Patat S.A., Carlin J.B., Grimwood K., Jones A., Armstrong D.S., Galati J.C., Cooper P.J., Byrnes C.A., Francis P.W., Robertson C.F., Hume D.A., **Borchers C.H.**, Wainwright C.E., Wainwright B.J. Proteomic Profiling reveals novel markers of the exaggerated pulmonary inflammatory response in paediatric cystic fibrosis bronchoalveolar lavage fluid. *Journal of Clinical Chemistry*, 53(10): 1782 - 91(2007)
- Myers-Morales, T., Cowan, C., Gray, M.E., Wulff, C.R., Parker, C.E., **Borchers, C.H.**, Straley, S.C., A Surface-Focused Biotinylation Procedure Identifies the *Yersinia pestis* Catalase KatY as a Membrane Associated but Non-Surface Located Protein *Appl. Environ. Microbiol.*, 73(18): 5750-5759 (2007)
- Reid, J.D., Parker, C.E., **Borchers, C.H.**, Protein arrays for biomarker discovery *Current Opinion in Molecular Therapeutics*, 9: 222-230 (2007)
- Torres, M.P., **Borchers, C.H.**, Phosphorylation of the APC Inhibitory Subunit Mnd2 is Necessary for Efficient Progression Through Meiosis. *JBC*, 282(24): 62 (2007)17351
- Boysen, G., Scarlett, C.O., Temple, B., Combs, T.P., Brooks, N.L., **Borchers, C.H.**, Swenberg, J.A., Identification of covalent modifications in P450 2E1 by 1,2-epoxy-3-butene in vitro. *Chem. Biol. Interact.*, 166(1-3): 170-5 (2007)
- Hao, N., Behar, M., Parnell, S.C., Torres, M.P., **Borchers, C.H.**, Elston, T.C., Dohlman, H.G., Experimental and computational analysis of feedback inhibition of the Sho1 osmotic stress-response pathway *Current Biology*, 17(8): 659-67 (2007)
- Thelin, W.R., Chen, Y., Gentzsch, M., Kreda, S., Sallee, J., Scarlett, C., **Borchers, C.H.**, Jacobson, K., Jackson Stutts, M., Milgram, S.L. A direct interaction with filamins modulates the stability and plasma membrane expression of CFTR. *Journal of Clinical Investigation*, 117(2): 364-374 (2007)
- Dial, J.M., Petrotchenko, E.V., **Borchers, C.H.**, Inhibition of APC^{Cdh1} activity by Cdh1/Acm1/Bmh1 ternary complex formation. *JBC*, 282(8): 5237-48 (2007)
- Bhati, R., Goekmen-Polar, Y., Sledge G.W. Jr., Nakshatri, H., Ketelsen, D., Fan, C., **Borchers, C.H.**, Dial, M.J., Patterson, C., Klauber-DeMoore, N. 2-Methoxyestradiol Inhibits the Anaphase Promoting Complex and Protein Translation in Human Breast Cancer Cells. *Cancer Research*, 67(2): 702-708 (2007)
- Jiang, J., Parker, C.E., Robinette, D., **Borchers, C.H.**, A Clinical Diagnostics Platform – Protein Detection Using an Immunoaffinity-based Peptide Chip *BIOforum Europe*, 10/2006: 18-20 (2006)
- Inoue, K., **Borchers, C.H.**, Negishi, M., Cohesin protein SMC1 represses the nuclear receptor CAR-mediated synergistic activation of a human P450 gene by xenobiotics. *Biochemical Journal*, 398(1): 125-133 (2006)
- Petrotchenko, E.V., Pasek, D., Elms, P., Dokholyan, N.V., Meissner, G., **Borchers C.H.**, Combining fluorescence detection and mass spectrometric analysis for comprehensive and quantitative analysis of redox-sensitive cysteines in native membrane proteins. *Analytical Chemistry*, 78(23): 7959-7966 (2006)
- Laith, Q.A-M., Fikkert, V., Dayam, R., Burke, T.R., **Borchers, C.H.**, Neamti, N. Discovery of a novel small molecule HIV-1 integrase inhibitor binding-site through photoaffinity labeling and mass spectrometry. *PNAS*, 103(26): 10080-10085 (2006)
- Robinette, D., Neamati, N., Tomer, K.B., **Borchers, C.H.**, Photoaffinity Labeling Combined with Mass Spectrometric Approaches as a Tool for Structural Proteomics. *Expert Review in Proteomics*, 3(4): 399-408 (2006)
- Borchers C.H.**, Thapar R., Petrotchenko E.V., Torres M.P., Speir J.P., Easterling M., Dominski Z., Marzluff W.F. Combined top-down and bottom-up proteomics identifies a phosphorylation site in stem-loop binding proteins that contributes to high-affinity RNA binding. *PNAS* (2006), 103(9), 3094-3099.
- Petrotchenko, E.V., Pasek, D., Elms, P., Dokholyan, N.V., Meissner, G., **Borchers C.H.**, Combining fluorescence detection and mass spectrometric analysis for comprehensive and quantitative analysis of redox-sensitive cysteines in native membrane proteins. *Analytical Chemistry*, (2006) 78(23): 7959-7966
- Laith, Q.A-M., Fikkert, V., Dayam, R., Burke, T.R., **Borchers, C.H.**, Neamti, N. Discovery of a novel small molecule HIV-1 integrase inhibitor binding-site through photoaffinity labeling and mass spectrometry. *PNAS*, (2006) 103(26): 10080-10085
- Robinette, D., Neamati, N., Tomer, K.B., **Borchers, C.H.**, Photoaffinity Labeling Combined with Mass Spectrometric Approaches as a Tool for Structural Proteomics. *Expert Review in Proteomics*, (2006) 3(4): 399-408
- Tsukada Y.I., Fang J., Erdjument-Bromage H., Warren M.E., **Borchers C.H.**, Tempst P., Zhang Y. Histone demethylation by a family of JmjC domain-containing proteins. *Nature* (2006), 439(7078), 811-816
- Torres P.T., Thapar R., Marzluff W.F., **Borchers C.H.**, Phosphatase-Directed Phosphorylation-Site Determination: A synthesis of Methods for the Detection and Identification of Phosphopeptides. *Journal of Proteome Research*, 4: 1628-1635 (2005)

Principal Investigator/Program Director (Last, First, Middle):

Petrotschenko E.V., Olkhovik V.K., **Borchers C.H.** Isotopically-Coded Cleavable Crosslinker for Studying Protein-Protein Interaction and Protein Complexes. *Molecular and Cellular Proteomics* (2005), 4(8) 1167-1179.

Loiselle D.R., Thelin W.R., Parker C.E., Dicheva N.N., Kesner B.A., Mocanu V., Wang F., Milgram S.L., Warren M.R.E., **Borchers C.H.** Improved Protein Identification through the Use of Unstained Gels. *Journal of Proteome Research* (2005), 4, 992-997.

Warren E.N., Jiang J., Parker C.E., **Borchers C.H.** Absolute Quantitation of Cancer-related Proteins using an MS-based Peptide Chip. *BioTechniques* (2005), 38, S7-S11.

Warren M.R.E., Parker C.E., Mocanu V., Klapper D., **Borchers C.H.** Electrospray Ionization Tandem Mass Spectrometry of Model Peptides Reveals Diagnostic Fragment Ions for Protein Ubiquitination. *Rap. Commun. Mass Spectrom.* (2005), 19, 1-9.

Parker C.E., Mocanu V., Greer S.F., **Borchers C.H.** Mass Spectrometric Determination of Protein Ubiquitination. In: "Methods in Molecular Biology", Editor Patterson, W.C., Humana Press, NJ, (2005), 301, 153-173.

Parker C.E., Warren M.R., Loiselle D., **Borchers C.H.** Identification of Components of Protein Complexes. In: "Methods in Molecular Biology", Editor Patterson, W.C., Humana Press, NJ, (2005), 301, 117-51.

Borchers C., Chen T., Neamati N., In: "Application of Proteomics in Basic Biological Sciences and Cancer", *Molecular Carcinogenesis and the Molecular Biology of Human Cancer*. Editor Warshawsky. D., Landolph J.R., CRC press, Boca Raton, FL, (2005), 263-288.

RESEARCH SUPPORT:

Ongoing

- 2009 - 11 European Commission Grant
"Targeting the *Leishmania* kinome for the development of novel anti-parasitic strategies"
Role: Subcontractor
- 2008 - 13 Networks of Centres of Excellence Program
"Centre of Excellence for Commercialization and Research in the Prevention of Epidemic Organ Failure"
Role: Senior Executive
- 2008 - 10 Israeli Ministry of Health Grant
"Phosphoproteome analysis of *Leishmania donovani* differentiation"
Role: Collaborator
- 2008 - 09 Western Economic Diversification Canada
"Establishment of Comprehensive Metabolite Analysis at the UVic Genome BC Proteomics Centre"
Role: Principle Investigator
- 2008 - 10 Genome Canada Technology Development Grant
"MS-based Structural Proteomics for Drug Development and Design"
Role: Principle Investigator
- 2007 - 11 National Cancer Institute: Clinical Proteomic Technology Assessment for Cancer Program (1U24CA126476-01)
"Stable Isotope Standards with Capture by Anti-Peptide Antibody (SISCAPA)"
Role: Mass Spectrometry Director
- 2007 - 09 Michael Smith Foundation for Health Research
"The BC Proteomics Network"
Role: Co-leader
- 2007 - 08 National Institutes of Health (1R21DC008160-01)
Temple University
Role: Subcontractor

Principal Investigator/Program Director (Last, First, Middle):

- 2006 – UVic Department of Biochemistry and Microbiology
Start-Up Funds
Role: Principle Investigator
- 2006 – 08 Genome Canada Platform Grants
“Competition III, Science and Technology Platform; Applied Health”
Role: Principle Investigator

Completed

- 2006 – 07 Genome Canada
“Acquisition of a MALDI-TOF/TOF Mass Spectrometer”
Role: Principal Investigator
- 2006 – 08* National Institutes of Health Grant (1R21DC008160-01)
“Cochlear Nucleus Proteomics in a Mouse Model of Age-Related Hearing Loss”
Role: Principal Investigator
- 2005 – 07 Cystic Fibrosis Foundation Grant (CFFTI BORCHE05U0)
“Proteomic and Metabolomic Biomarkers of CF Lung Disease”
Role: Principal Investigator
- 2005 – 06 North Carolina Biotechnology Center Grant (NCBC 2005-IDG-1015)
“Acquisition of MALDI-source for an Ultra-high Resolution Mass Spectrometer”
Role: Principal Investigator
- 2005 – 06 National Institutes of Health Grant (1-S10-RR019889-01)
“Acquisition of an Ultra-high Resolution Mass Spectrometer”
Role: Principal Investigator
- 2004 – 10* National Institutes of Health Grant (5P30ES10126-04)
“Center of Environmental Health and Susceptibility (CEHS)”
Role: Director CEHS Biomarker Core Facilities
- 2003 – 06 UNC-CH Department of Biochemistry and Biophysics
Start-Up Funds
Role: Principal Investigator
- 2002 – 12* National Institutes of Health Grant (5 U54 HD035041-07)
“Molecular Regulation in Reproduction”
Role: Faculty Director - National Center for SCCPRR Proteomics
- 2002 – 12* National Institutes of Health Grant (P30 CA 16086-25)
“Cancer Center Core Support Grant”
Role: Faculty Director - Proteomics Core
- 2002 – 06 Cystic Fibrosis Foundation Grant (CFFTI STUTTS01U0)
“Discovery of Novel Proteins that Associates with CFTR”
Role: Principal Investigator for Project 1
- 2002 – 05 National Institutes of Health Grant (R21 ES11997-01)
“Binding Network of Pol Eta in DNA Damage Response”
Role: Principal Investigator

*Projects continuing until stated end date, role resigned in 2006 due to relocation to Victoria, BC