

KATRINE L. WHITESON

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www.whiteson.org/katrine

EDUCATION

- 2001 – 2007 Ph.D., University of Chicago, Chicago, Illinois
Biochemistry and Molecular Biology
- 1996 – 2000 B.A., University of California, Berkeley
Molecular Cell Biology, Biochemistry

RESEARCH

- 2013 - Adjunct Assistant Research Professor, SDSU
2011 - 2013 Post-doctoral Research with Prof. Forest Rohwer
San Diego State University, California

Conducting studies of human-associated microbial and viral communities.
Linking Cystic Fibrosis breath gas metabolites with sputum metagenomes to
elucidate microbial physiology and human disease state.

- 2008 – 2011 Research Scientist with Dr. Jacques Schrenzel and Dr. Patrice François
Genomics Research Lab (www.genomic.ch)
University of Geneva Hospitals, Geneva, Switzerland
(30% part-time position)

Examined microbial communities in healthy and diseased human oral
samples. Used both Illumina and 454 high throughput sequencing of 16S
rRNA marker genes for community structure analysis. Carried out study
design, sample preparation, data analysis and grant applications.

- 2001-2007 University of Chicago, Chicago, Illinois
Advisor: Phoebe Rice

Dissertation: “Active site chemistry and specificity of Flp recombinase”
Exploit the *trans* nature of the architecture of the Flp recombinase active site
to study the role of catalytically active residues, and understand how the
enzyme has specificity for its DNA substrate in both binding and catalytic
steps.

Internships

Max Planck Institute, Dortmund, Germany (Martin Engelhard) *Summer 2003*
Hagedorn Research Institute, Gentofte, Denmark (Pierre de Meyts) *2000-01*
Field Museum of Natural History, Chicago, IL (Bruce Patterson) *Summer 2000*
UC Berkeley Biochemistry Department (Jack Kirsch) *Fall 1999-Spring 2000*
National Institutes of Health (Ilani Atwater) *Summer 1999*
Lawrence Livermore National Lab (Mike Colvin) *Summer 1998*

TEACHING

- 2007 – 2008 Lecturer
University of California, Irvine
Molecular Biology and Biochemistry
Fall 2007 and Winter 2008: Bio12D; Spring 2008: Bio9C
- Designed and taught two new undergraduate courses: “Molecular Basis of Human Disease” and “Biotech Basics”. Writing textbook for Garland Science based on human disease course, estimated publication date 2015.*
- 2006 – 2007 Teaching consultant for graduate student instructors.
University of Chicago Center for Teaching and Learning
- 2005 – 2006 Volunteer biology instructor at public high school on Chicago’s south side.
University of Chicago Bio-Outreach
- 2002 Teaching Assistant for graduate level protein structure course *Spring*
2004 Teaching Assistant for advanced undergraduate biochemistry course *Fall*
University of Chicago Biochemistry Department
- 2002 – 2004 Tutor for middle school students from Chicago’s south side neighborhoods.
Washington Park Youth Program, Chicago, IL *Fall 2002-Spring 2004*
- 2001 English as a second language instruction in a rural Thai orphanage and school.
Moo Ban Dek, Kanchanaburi Province, Thailand *Summer 2001*
- 1998-2000 Instructor and Tutor for Biology 1A.
UC Berkeley Student Learning Center
- 1998 Counselor at camp for diabetic children outside Santiago, Chile
Diabetes Camps for Children, Renaca, Chile *December 1998*
- 1995-1997 Counselor; outdoor camp and backpacking director at camp for developmentally disabled children and adults
Camp Krem, Boulder Creek, CA

PRESENTATIONS

- 2013 "Cystic Fibrosis: Ecology, Evolution, and Eradication" Telluride, CO
2013 Human Microbiome Project Vision, Bethesda, MD
2013 Systems and Synthetic Microbiology Investigative Workshop, NIMBioS, Knoxville, TN (poster)
2013 San Diego State University Dept. of Biology Seminar
2013 NIH workshop: Dynamics of Host Associated Microbial Communities
2013 San Diego Microbiology Group
2013 Institute for Clinical Translational Science, UC Irvine (poster)
2012 Sonoma International Breath Analysis meeting
2012 Microbiology of CF Airways Workshop, Rigshospitalet, Copenhagen
2012 International Society of Microbial Ecology, invited talk at ISME14, Copenhagen
2012 Wine'ing about CF, San Diego
2012 University of Amsterdam

- 2012 Lake Arrowhead Microbial Genomics
 2012 U. Washington Seattle
 2012 Innate Immunity and the Microbiome, Keystone, Colorado (poster)
 2011 UCL London
 2011 University of Copenhagen
 2011 EPFL Lausanne
 2011 FEMS Microbiology Congress, Geneva, Switzerland
 2011 Keystone meeting: Microbial Communities Drive Ecosystem Complexity
 2011 UC Irvine Dept of Ecology and Evolution, Microbial Group
 2010 Lake Arrowhead Microbial Genomics meeting
 2010 International Association of Dental Research (IADR), Barcelona, Spain *declined*
 2010 Swiss Society of Microbiology Annual Meeting, Zurich, Switzerland
 2010 Systems Biology of Micro-organisms Meeting, Paris, France
 2009 Swiss Society of Microbiology Annual Meeting, Lausanne, Switzerland *declined*

AWARDS

- Lake Arrowhead Microbial Genomics Poster Award, 2012
 Molecular Cell Biology Training Grant, University of Chicago, 2001- 2007
 Regents and Chancellors Scholar, UC Berkeley, 1996-2000
 Alumni Scholarship, UC Berkeley, 1996-2000

FUNDING

- NIH R01GM095384 – 01S1 11/1/11 – 11/1/14
 Parent Grant: Ecology of Cystic Fibrosis PI: Rohwer, F
 Supplement 1: Training Fellowship (PA-08-191) Direct Costs ~\$100,000
 Role: Recipient of fellowship
 Supplement 2: Collaborative activities to Promote Metabolomics Research (PA-13-041)
 Direct Costs \$100,000
- NIH R56 AI097626 01A1 8/23/12 – 8/23/14
 Fecal Phage: Exposing Unknowns in the Dark Matter of the Human Gut
 Role: Key Personnel PI: Rohwer, F
 Direct Costs: \$255,310
- San Diego Clinical Translational Research Institute Pilot grant 3/1/13 – 3/1/14
 Metabolites as biomarkers in Cystic Fibrosis
 PIs: Whiteson, K, Dorrestein, P, Rohwer, F and Conrad, D
 Direct Costs: \$50,000
- University of Illinois IGB Seed Grant 1/15/14 – 1/14/15
 Coevolutionary genomics: Investigating the impact of microbial host-pathogen coevolution
 on the dynamics of infectious disease.
 Role: Co-Investigator PI: Rachel Whitaker
 Direct Costs: \$100,000

COURSES and SOFTWARE

- 2011 Strategies and Techniques for Analyzing Microbial Population Structure
 (STAMPS) course, Woods Hole, MA
 Software used in bioinformatics and ecological statistics: Qiime, Prinseq, Deconseq,
 Primer, R

LANGUAGES

- Conversational Danish, French and Spanish

REVIEWERSHIPS and other SERVICE

• Garland Science • Swiss National Foundation • Journal of Breath Research • African Journal of Microbiology • Applied Microbiology and Biotechnology • Guest Associate Editor, *Frontiers in Microbiology* • Agence Nationale de la Recherche (ANR, France) grant review Equipex panel, Paris, FR (9/2011, 12/2011) • Meeting Organizer for "Cystic Fibrosis: Ecology, Evolution, and Eradication" Telluride, CO, July 2013

PUBLICATIONS

- Whiteson, K.**, Meinardi, S., Lim, Y.W., Schmieder, R., Quinn, R., Maughan, H., Blake, D.R., Conrad, D., Rohwer, F. Breath gas metabolites and bacterial metagenomes from Cystic Fibrosis airways indicate active pH neutral 2,3-butanedione fermentation. (*Online at ISMEJ*; doi: ISMEJ.2013.229) ★ highlighted in several news articles and blogs: http://www.altmetric.com/details.php?citation_id=2042954
- Whiteson, K.**, Bailey, B., Bergkessel, M., Conrad, D., Delhaes, L., Felts, B., J. Kirk Harris, R. Hunter, Y.W. Lim, H. Maughan, R. Quinn, P. Salamon, J. Sullivan, B.D. Wagner, P.B. Rainey and the CF Telluride 2013 Working Group. The upper respiratory tract as a microbial source for pulmonary infections: Parallels from Island Biogeography. (*invited AJRCCM perspective accepted with revisions*)
- Quinn, R.A., Hester, E., Lim, Y.W., Conrad, D., Rohwer, F., and **Whiteson, K.** Biogeochemical forces shape the composition and physiology of polymicrobial communities in the Cystic Fibrosis lung. (*Online at mBio*; doi:10.1128/mBio.00956-13)
- Whiteson, K.**, Hernandez, D., Lazarevic, L., Gaia, N., Farinelli, F., François, P., Pilo, P., Frey, J., Schrenzel, J. A genomic perspective on a new bacterial genus and species from the Alcaligenaceae family, *Basilea psittacopulmonis* DSM 24701. (*Online at BMC Genomics*; doi:10.1186/1471-2164-15-169) ★ highly accessed
- Barr, J. J., Auro, R., Furlan, M., **Whiteson, K. L.**, Erb, M. L., Pogliano, J., Stotland, A., Wolkowicz, R., Cutting, A. S., Doran, K. S., Salamon, P., Youle, M., and Rohwer, F. 2013. Bacteriophage adhering to mucus provide a non-host-derived immunity. *PNAS* 110, 10771–10776.
- highlighted in:*
- ★ Meyer, J. R. (2013) Sticky bacteriophage protect animal cells. *Proc. Natl. Acad. Sci. U.S.A.* 110, 10475–10476.
 - ★ Wootton, L. (2013) Phage biology: A new barrier at mucosal surfaces. *Nat. Rev. Microbiol.* 11, 430–431.
 - ★ Microbiomics: A virus shield. *The Economist*, May 25, 2013.
 - ★ Friendly Viruses Protect Us Against Bacteria. *Science*, May 20, 2013.
 - ★ Yong, E. (2013) Viruses in the gut protect from infection. *Nature*.
 - ★ Zimmer, C. (2013) Meet Your New Symbionts: Trillions of Viruses. *National Geographic*
 - ★ Zielinska, E. (2013) Protective Phages Viruses that attack bacteria may be an important component of our gut microbiota. *The Scientist*
- Lazarevic, V., Manzano, S., Gaia, N., Girard, M., **Whiteson, K.**, Hibbs, J., Francois, P., Gervais, A., and Schrenzel, J. Effects of amoxicillin treatment on the salivary microbiota in children with acute otitis media. *Clin Microbiol Infect* 2013; 19: E335–E342.
- Lim, Y. W., Schmieder, R., Haynes, M., Furlan, M., Matthews, T. D., **Whiteson, K.**, Poole, S. J., Hayes, C. S., Low, D. A., Maughan, H., Edwards, R., Conrad, D., and Rohwer, F. 2013. Mechanistic Model of *Rothia mucilaginosa* Adaptation toward Persistence in the CF Lung, Based on a Genome Reconstructed from Metagenomic Data. *PLoS ONE* 8, e64285.

- Reyes, A., Semenkovich, N.P., **Whiteson, K.**, Rohwer, F., Gordon, J.I., 2012. Going viral: next-generation sequencing applied to phage populations in the human gut. *Nat. Rev. Microbiol.* 10, 607–617.
- Bolivar, I.*, **Whiteson, K.***, Stadelmann, B., Baratti-Mayer, D., Gizard, Y., Mombelli, A., Pittet, D., Schrenzel, J., 2012. Bacterial diversity in oral samples of children in Niger with acute NOMA, acute necrotizing gingivitis, and healthy controls. *PLoS Negl Trop Dis* 6, e1556.
* contributed equally
- Fischer, A., **Whiteson, K.**, Lazarevic, V., Hibbs, J., Francois, P., Schrenzel, J., 2012. Infant gut microbial colonization and health: recent findings from metagenomics studies. *Journal of Integrated OMICS*.
- Lazarevic, V., **Whiteson, K.**, Gaïa, N., Gizard, Y., Hernandez, D., Farinelli, L., Osterås, M., François, P., Schrenzel, J., 2012. Analysis of the salivary microbiome using culture-independent techniques. *J Clin Bioinformatics* 2, 4.
- Stenz, L., Francois, P., **Whiteson, K.**, Wolz, C., Linder, P., Schrenzel, J., 2011. The CodY pleiotropic repressor controls virulence in gram-positive pathogens. *FEMS Immunol. Med. Microbiol.* 62, 123–139.
- Lazarevic, V., **Whiteson, K.**, François, P., Schrenzel, J., 2010. The salivary microbiome, assessed by a high-throughput and culture-independent approach. *Journal of Integrated OMICS* 1, 28–35.
- Lazarevic, V., **Whiteson, K.**, Hernandez, D., François, P., Schrenzel, J., 2010. Study of inter- and intra-individual variations in the salivary microbiota. *BMC Genomics* 11, 523.
- Lazarevic, V.*, **Whiteson, K.***, Huse, S., Hernandez, D., Farinelli, L., Osterås, M., Schrenzel, J., François, P., 2009. Metagenomic study of the oral microbiota by Illumina high-throughput sequencing. *J. Microbiol. Methods* 79, 266–271.
* contributed equally ** Top 25 hottest articles, #1, October – December 2009
- Whiteson, K.L.**, Rice, P.A., 2008. Binding and catalytic contributions to site recognition by flp recombinase. *J. Biol. Chem.* 283, 11414–11423.
- Whiteson, K.L.**, Chen, Y., Chopra, N., Raymond, A.C., Rice, P.A., 2007. Identification of a potential general acid/base in the reversible phosphoryl transfer reactions catalyzed by tyrosine recombinases: Flp H305. *Chem. Biol.* 14, 121–129.
- Grindley, N.D.F., **Whiteson, K.L.**, Rice, P.A., 2006. Mechanisms of site-specific recombination. *Annu. Rev. Biochem.* 75, 567–605.
- IN PREPARATION
- Whiteson K.L.**, Lazarevic V., Tangomo M., Girard M., Francois P., Schrenzel J. and the GESNOMA study group. NOMA affected children from Niger have distinct oral microbial communities based on 454 high-throughput sequencing of 16S rRNA gene fragments (*In preparation*).
- Quinn, Robert A., Phelan, V., **Whiteson, K.**, Bailey, B., Meehan, M., Lim, Y.W., Sanchez, S., Conrad, D., Rohwer, F., and Dorrestein, P. A novel approach to metabolomics of the Cystic Fibrosis polymicrobial infection. (*In preparation*).
- Quinn, R.A, **Whiteson, K.**, Lim, Y.W., Conrad, D., Candido, A., Salamon, P., and Rohwer, F. A Winogradsky-based model of the Cystic Fibrosis lung microbial community reveals patient and disease state specific functional differences. (*In preparation*).
- Whiteson K.L.**, Lazarevic V., Tangomo M., Girard M., Francois P., Schrenzel J. Shared human oral microbial community structure in co-habiting family members. (*In preparation*)
- Whiteson K.** Human Disease at a Molecular Level. *Contract with Garland Science; undergraduate textbook in preparation, six of nine chapters have been reviewed by professors of relevant courses*