

# Paul Jaschke

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Y2E2, Bioengineering  
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## SUMMARY

Biological engineer with diverse research experience ranging from chlorophyll biosynthesis to building synthetic virus genomes. Proven track record in scientific publications, mentoring and leadership. Secured over \$154,000 in awards over career.

## EDUCATION

**Ph.D. in Microbiology** 2010  
University of British Columbia, Vancouver, Canada  
Advisor: JT Beatty  
Dissertation: *Discovery and characterization of a new zinc chlorophyll biosynthetic pathway and photosystem in a magnesium-chelatase mutant*

**B.Sc. First-Class Honors Biochemistry** 2003  
University of Alberta, Edmonton, Canada  
Research Advisor: Marek Michalak  
Honors Thesis: *The role of calreticulin in cardiomyocyte differentiation*

## RESEARCH EXPERIENCE

**Endy Laboratory** 11/2010-Present  
Bioengineering Department, Stanford University, USA  
Postdoctoral Researcher

- Developed method to assemble virus genomes inside yeast
- Built the first fully decompressed virus genome
- Published results, presented findings at Synthetic Biology 5.0 international conference, and gave an invited seminar at the University of British Columbia

**Beatty Laboratory** 09/2004-2010  
Microbiology & Immunology Department, University of British Columbia, Canada  
Ph.D. Student

- Discovered and characterized a novel chlorophyll biosynthesis pathway operating in photosynthetic bacteria
- Authored six papers and a *Methods in Enzymology* book chapter
- Presented findings at institutional, regional, and international conferences resulting in multiple presentation awards

**Garson Laboratory**

05-07/2004

Chemistry Department, University of Queensland, Australia  
Research Technician

- Developed a novel seawater experimental flow cell to study sponge wound chemical responses

**Michalak Laboratory**

06-09/2003

Biochemistry Department, University of Alberta, Canada  
Summer Student Research Assistant

- Determined the effects of calreticulin deficiency on cardiomyocyte development using a murine stem cell model
- Won Canadian Institutes of Health award for results presented at meeting

**Casey Laboratory**

06-09/2002

Biochemistry Department, University of Alberta, Canada  
Summer Student Research Assistant

- Investigated human sodium bicarbonate co-transporter function and published results in a peer-reviewed journal

**PEER-REVIEWED PUBLICATIONS**

Jaschke PR, Lieberman EK, Rodriguez J, Sierra A, Endy D. (2012). A fully decompressed synthetic bacteriophage øX174 genome assembled and archived in yeast. *Virology*. 434(2):278-84.

- Selected for journal cover
- Featured in Scitable by Nature Education blog Bio 2.0

Neupane B, Jaschke P, Saer R, Beatty JT, Reppert M, Jankowiak R. (2012). Electron transfer in *Rhodobacter sphaeroides* reaction centers containing Zn-bacteriochlorophylls: a hole-burning study. *Journal of Physical Chemistry B*. 116(10):3457-66.

Jaschke PR, Hardjasa A, Digby EL, Hunter CN, Beatty JT. (2011). A *bchD* (Mg-chelatase) mutant of *Rhodobacter sphaeroides* synthesizes zinc bacteriochlorophyll through a novel zinc-containing pathway. *Journal of Biological Chemistry*. 286(23):20313-22.

Jaschke PR, Drake I, Beatty JT. (2009). Modification of a French pressure cell to improve microbial cell disruption. *Photosynthesis Research*. 102(1): 95-7.

Lin S, Jaschke PR, Wang H, Paddock M, Tufts A, Allen JP, Rosell FI, Mauk GA, Woodbury NW, Beatty JT. (2009). Electron transfer in the *Rhodobacter sphaeroides* reaction center assembled with zinc bacteriochlorophyll. *Proceedings of the National Academy of Sciences of the USA*. 106(21): 8537-42.  
• Research featured on Sciencedaily.com

Jaschke PR, LeBlanc HN, Lang AS, Beatty JT. (2008). The PucC protein of *Rhodobacter capsulatus* mitigates an inhibitory effect of light-harvesting 2 alpha and beta proteins on light-harvesting complex 1. *Photosynthesis Research*. 95(2-3): 279-84.

Jaschke PR, Beatty JT. (2007). The photosystem of *Rhodobacter sphaeroides* assembles with zinc bacteriochlorophyll in a *bchD* (magnesium chelatase) mutant. *Biochemistry*. 46(43): 12491-500.

Loiselle FB, Jaschke P, Casey JR. (2003). Structural and functional characterization of the human NBC3 sodium/bicarbonate co-transporter carboxyl-terminal cytoplasmic domain. *Molecular Membrane Biology*. 20(4): 307-17.

#### **NON-PEER REVIEWED PUBLICATIONS**

Jaschke P, Lu J, Mulyasasmita W, Lee LJ. (2013). Incyte Pharmaceuticals Is Primed For A Run. *Seeking Alpha*. Article ID: 1156061. (online).

- Correctly predicted 28% jump in biopharmaceutical company stock price.

#### **BOOK CHAPTERS**

Jaschke PR, Saer RG, Noll S, Beatty JT. (2011). Modification of the genome of *Rhodobacter sphaeroides* and construction of synthetic operons. *Methods in Enzymology*. Vol 497: *Synthetic Biology*. Ch 23. 519-38.

#### **HONORS AND AWARDS**

SB5.0 International Conference Travel Award (\$250)	2011
Natural Sciences & Engineering Research Council Postdoctoral Fellowship (\$80,000) <i>Awarded to top 20% of applicants</i>	2010
Recognized at the UBC Student Leader Reception	2010
Sigma-Aldrich Award for Best Presentation at Life Sciences Institute Conference (\$100) <i>Awarded to one talk for entire conference</i>	2009
The Pacific Century Graduate Scholarship (\$10,000) <i>Awarded to top 50 graduate students at UBC</i>	2008
University of BC Graduate Fellowship (\$7,000)	2008
Beverly Green Award for Best Presentation at Western Photosynthesis Conference (\$500) <i>Awarded to one talk for entire conference</i>	2008
John Richard Turner Fellowship in Microbiology (\$9,000) <i>Awarded to top graduate student in Microbiology Department at UBC</i>	2007
University of BC Graduate Fellowship (\$16,000)	2006
Natural Sciences & Engineering Research Council Postgraduate Scholarship (\$19,100) <i>Awarded to top 30% of applicants</i>	2005
Canadian Institutes of Health Research Presentation Award (\$100) <i>Awarded to one summer student talk</i>	2003
Alberta Heritage Foundation for Medical Research Summer Studentship (\$5,300)	2002/03
Jason Lang Scholarship (\$2,000)	2000/02

## MENTORING EXPERIENCE

**San Mateo Biotechnology Career Pathway Internship Program** 02/2011-06/2013

Stanford University, USA

- Guided a high-school student developing a method to modify virus genomes during infection

**Research Experience for Undergraduate (REU) Program** 05/09-2012/2013

Bioengineering Undergraduate Research Project Supervisor

Stanford University, USA

- Managed undergraduate students assembling several redesigned  $\phi$ X174 viral genomes in yeast
- Resulted in student co-authorship on a peer-reviewed publication

**BioE 44: Synthetic Biology Lab** 05-06/2011

Undergraduate Research Project Supervisor

Stanford University, USA

- Mentored two undergraduate students computationally decompressing the  $\phi$ X174 viral genome
- Resulted in student co-authorship on a peer-reviewed publication

**UBC Graduate School Information Events** 2010

Incoming Student Mentor

University of British Columbia, Canada

**University of British Columbia iGEM Team** 01-12/2009

Advisor and Research Supervisor

University of British Columbia, Canada

- Set up lab, directed day to day research activities and dealt with troubleshooting, and managed laboratory consumable supplies
- *E. coli* traffic light biosensor project resulted in Gold Medal at iGEM Final Jamboree

**MICB 448: Directed Research** 2007, 2009-2010

Undergraduate Research Project Supervisor

University of British Columbia, Canada

- Supervised undergraduate students characterizing a novel zinc chlorophyll biosynthetic pathway
- Resulted in student co-authorship on a peer-reviewed publication

## TEACHING EXPERIENCE

**Making a bacterial copper biosensor** 06/2013

Zamorano Pan-American Agricultural School, Honduras

Course Designer and Instructor

- Introductory synthetic biology class for undergraduate students
- Taught design principles of plasmids parts (genes, markers, replication) and copper inducible promoter
- Demonstrated copper activation of *E. coli* biosensor color output

## **Bacteriophage capture and release from yeast**

05-06/2012

BioCurious, community biolab, Sunnyvale, CA

Course Designer and Instructor

- Introductory synthetic biology class for non-scientists
- Developed and taught class where students assembled a bacteriophage genome inside yeast, then purified and re-infected the original *E. coli* host, thus showing the genome was still functional after its journey through yeast.

## **GFP expression in *E. coli*: Make cells glow!**

11/2011- 01/2012

BioCurious, community biolab, Sunnyvale, CA

Instructor

- Introductory molecular biology class for non-scientists
- Taught students about bacterial transformation, central dogma of molecular biology, fluorescent proteins, antibiotic resistance as a selection tool, and practical and ethical concerns when using recombinant DNA technology.

## **MICB405: Bioinformatics**

Fall Semester 2005 - 2008

University of British Columbia, Canada

Teaching Assistant

- Taught and developed new lesson plans for upper level bioinformatic class recitation sections in topics such as: BLAST, genome browsers, multiple sequence alignments, phylogenetic trees, and protein structure prediction and exploration.

## **PROFESSIONAL ACTIVITIES**

Reviewer for PLOS ONE and Journal of Proteome Research

American Association for the Advancement of Science (AAAS) member

Project Management Workshop

Grant Writing for Funding and Research Development Workshop

Elected graduate student representative to Microbiology Department faculty meetings

## **PRESENTATIONS**

Jaschke PR. (2013). *What is synthetic biology, and why is it the field of the future?* Zamorano University Environment Week. Zamorano Pan-American Agricultural School, Honduras (Invited Speaker)

Jaschke PR, Lieberman EK, Liu D, Rodriguez J, Sierra A, Endy D. (2013). *Taming genome complexity via bacteriophage  $\phi$ X174 synthetic genome design*. Synthetic Biology Engineering Research Center (SynBERC) Retreat. University of California, Berkeley, Berkeley, CA (Poster)

Jaschke PR. (2012). *Design and construction of a fully decompressed bacteriophage  $\phi$ X174 genome*. University of British Columbia Microbiology and Immunology Seminar Series. Vancouver, BC, Canada (Invited Speaker)

Jaschke PR. (2012). *Design and construction of bacteriophage genomes in yeast*. DuPont Genencor Science. Palo Alto, CA (Invited Speaker)

D'haeseleer P, Shigeta R, Noailles P, Jaschke P, Sahni P, Chavez M, Graham C. (2012). *BioCurious - Moving Biotech Science Education Beyond the Classroom*. ASM 2012 General Meeting. San Francisco, CA (Poster)

Jaschke PR, Rodriguez J, Sierra A, Endy D. (2011). *Redesign and construction of bacteriophage genomes in yeast*. Synthetic Biology Engineering Research Center (SynBERC) Retreat. University of California, Berkeley, Berkeley, CA (Poster)

Jaschke PR, Rodriguez J, Sierra A, Endy D. (2011). *Finishing the genetics of the small phage  $\phi$ X174*. Stanford University Bioengineering Department Retreat. Santa Cruz, CA (Poster)

Jaschke PR and Endy D. (2011). *Construction and characterization of redesigned phage genomes*. Synthetic Biology Engineering Research Center (SynBERC) Retreat. Emeryville, CA. (Poster)

Jaschke PR. (2009). *Out of the Blue: a new beginning to the chlorophyll synthesis pathway discovered in a Mg-chelatase mutant*. Interview Seminar. Stanford University, Stanford, CA (Oral Presentation)

Jaschke PR. (2009). *Out of the Blue: characterizing a bchD (Mg-chelatase) mutant producing Zn-bacteriochlorophyll*. 9<sup>th</sup> International Conference on Tetrapyrrole Photoreceptors of Photosynthetic Organisms. Asilomar Conference Grounds, Pacific Grove, CA (Oral Presentation)

Jaschke PR. (2009). *Out of the Blue: the discovery of a new chlorophyll in the purple non-sulfur bacterium Rhodobacter sphaeroides*. University of British Columbia Microbiology and Immunology Seminar Series. Vancouver, BC, Canada (Invited Speaker)

Jaschke PR. (2009). *Investigation of the structure and function of a zinc bacteriochlorophyll photosystem in Rhodobacter sphaeroides*. 3<sup>rd</sup> Life Sciences Institute-Graduate Student Association Conference. University of British Columbia, Vancouver, BC, Canada (Oral Presentation)

- Won Sigma-Aldrich award (\$100) for best presentation of conference

Lin S, Jaschke PR, Wang H, Paddock M, Tufts A, Allen JP, Rosell FI, Mauk AG, Woodbury NW, Beatty JT. (2009). *Kinetics and energetics of electron transfer reactions in a photosynthetic bacterial reaction center assembled with zinc bacteriochlorophylls*. 53<sup>rd</sup> Biophysical Society Meeting. Boston, MA (Poster)

Jaschke PR. (2008). *Investigation of the structure and function of a zinc bacteriochlorophyll photosystem in Rhodobacter sphaeroides*. 17<sup>th</sup> Western Photosynthesis Conference. Asilomar Conference Grounds, Pacific Grove, CA (Oral Presentation)

- Won Beverley Green award (\$300) for outstanding work in photosynthesis research

Jaschke PR, LeBlanc HN, Beatty JT. (2007). *Assembly of purple bacterial photosynthetic complexes*. 14<sup>th</sup> International Congress of Photosynthesis. Glasgow, Scotland (Poster)

Jaschke PR, and Beatty JT. (2007). *Discovery of a novel form of chlorophyll in Rhodobacter sphaeroides*. American Society for Microbiology-Northwest Branch. Seattle, WA (Poster)

Jaschke PR. (2003). *The role of calreticulin in cardiomyocyte differentiation*. Canadian Institutes of Health Research and Alberta Heritage Foundation for Medical Research Summer Student Symposium. University of Alberta, Edmonton, Canada (Oral Presentation)

- Won award for outstanding presentation (\$100)

Jaschke PR. (2002). *Structural and functional characterization of the human NBC3 sodium/bicarbonate co-transporter carboxyl-terminal cytoplasmic domain*. Canadian Institutes of Health Research and Alberta Heritage Foundation for Medical Research Summer Student Symposium. University of Alberta, Edmonton, Canada (Oral Presentation)

## REFERENCES

**Drew Endy** (Postdoctoral Supervisor)

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Stanford University  
Y2E2, Bioengineering  
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**J Thomas Beatty** (Ph.D. Supervisor)

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