Robert J. Pantazes

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Education

Ph.D. in Chemical Engineering, May 2014
The Pennsylvania State University, Department of Chemical Engineering
Thesis: The Development of Computational Methods for Designing Antibodies and Other Proteins
Advisor: Costas Maranas
G.P.A: 3.94

B.S. in Chemical Engineering with Honors and High Distinction, May 2008
The Pennsylvania State University, Department of Chemical Engineering
Research Advisor: Costas Maranas
G.P.A. 3.88

Postdoctoral Education

Postdoctoral Fellow working with Patrick Daugherty in Chemical Engineering Department at the University of California, Santa Barbara, Feb. 2014 to Jan. 2016
Researching biomarker discovery for autoimmune diseases

Employment

Assistant Professor, Chemical Engineering Department, Samuel Ginn College of Engineering, Auburn University, Aug. 2016 – Present

- Researching the development and experimental evaluation of computational methods to design therapeutic proteins and diagnose diseases
- Teaching CHEN 3600, Computer-Aided Chemical Engineering

Scientist I, Serimmune Inc., Santa Barbara, CA, Feb. 2016 – Apr. 2016

- Bioinformatics analysis for the development of disease diagnostics

Research Skills and Highlights

- Expert in *de novo* antibody design and structure prediction
- Significant computational practice at enzyme redesign, modeling catalytic activity, protein structure prediction, and combinatorial library design
- Developed new algorithm to identify motifs using data from next generation sequencing experiments
- Experienced at surface-displayed protein library construction and evolution in *E. coli*
- Used fluorescent and magnetic-activated cell sorting to screen large peptide libraries

Honors and Awards

- Personal Excellence Award for Outstanding Presentation at the Graduate Research Symposium, 2011
- Leighton Riess Graduate Fellowship, 2011
- Personal Excellence Award for Outstanding Candidacy Exam, 2009
- Top Up Scholarship, 2008
- Larry Duda Undergraduate Student Research Award, 2008
- Eagle Scout, 2004

Professional Associations

- American Institute of Chemical Engineers, 2008-Present
- American Chemical Society, 2011-Present

Publications

Pantazes, R.J., J. Reifert, J. Bozekowski, K.N. Ibsen, J.A. Murray and P.S. Daugherty (**2016**), "Identification of disease-specific motifs in the antibody specificity repertoire via next-generation sequencing," *Scientific Reports*, **6**:30312, PMID:27481573

Heinzelman, P., J. Krais, E. Ruben and **R.J. Pantazes** (**2015**), "Engineering pH responsive fibronection domains for biomedical applications," *Journal of Biological Engineering*, **9(**6), PMID:26106447

Pantazes, R.J., M.J. Grisewood, T. Li, N.P. Gifford and C.D. Maranas (**2014**), "The Iterative Protein Redesign & Optimization (IPRO) Suite of Programs," *Journal of Computational Chemistry*, **36**(4): 251-263, PMID:25448866

Li, T., **R.J. Pantazes** and C.D. Maranas (**2014**), "OptMAVEn – A New Framework for the de novo Design of Antibody Variable Region Models Targeting Specific Antigen Epitopes," *PLOS One,* **9**(8), PMID: 25153121

Grisewood, M.J., N.P. Gifford, **R.J. Pantazes**, Y. Li, P.C. Cirino, M.J. Janik, and C.D. Maranas (**2013**), "OptZyme: Improving Enzyme Activity Using Transition State Analogues", *PLOS One*, **8**(10). PMID: 24116038

Pantazes, R.J. and C.D. Maranas (**2013**), "MAPs: A database of Modular Antibody Parts for predicting tertiary structures and designing affinity matured antibodies," *BMC Bioinformatics*, **14**(168). PMID: 23718826

Pantazes, R.J., M.J. Grisewood and C.D. Maranas (**2011**), "Recent advances in computational protein design," *Current Opinion in Structural Biology*, **6**(21): 1-6. PMID: 21600758

Pantazes, R.J. and C.D. Maranas (**2010**), "OptCDR: a general computational method for the design of antibody complementarity determining regions for targeted epitope binding," *Protein Engineering, Design & Selection*, **23**(11): 849-58. PMID: 20847101

Khoury, G.A., H. Fazelinia, J.W. Chin, **R.J. Pantazes**, P.C. Cirino and C.D. Maranas (**2009**), "Computationl Design of *Candida boidinii* Xylose Reductase for Altered Cofactor Specificity," *Protein Science*, **18**(10): 2125-38. PMID: 19693930

Pantazes, R.J., M.C. Saraf and C.D. Maranas (**2007**), "Optimal protein library design using recombination or point mutations based on sequence-based scoring functions," *Protein Engineering, Design & Selection*, **20**(8): 361-73. PMID 17686879

Posters

Pantazes, R.J. "Integrating Experimental and Computational Approaches to Discover and Design (Therapeutic) Proteins." Annual Meeting of the American Institute of Chemical Engineers, Salt Lake City, UT, November 8-13, **2015**

Pantazes, R.J. "Integrating Computational and Experimental Methods to Discover Disease Causes and Design Protein Therapeutics." Annual Meeting of the American Institute of Chemical Engineers, Atlanta, GA, November 16-21, **2014**

Pantazes, R.J. and C.D. Maranas, "Computational design of antibodies for binding targeted antigen epitopes with high affinity and selectivity," Biochemical and Molecular Engineering XVII, an ECI Conference Series, Seattle, WA, June 26-30, **2011**

Pantazes, R.J. and C.D. Maranas, "The Optimal Complementarity Determining Regions (OptCDR) method for the design of novel antibody libraries," Gordon Research Conference on Antibody Biology & Engineering, Ventura, CA, March 7-12, **2010**

Oral Presentations

Pantazes, R.J. and P.S. Daugherty. "Identifying Motifs Associated with Autoimmune Diseases Using Next Generation Sequencing Experiments." Annual Meeting of the American Institute of Chemical Engineers, Salt Lake City, UT, November 8-13, **2015**
Identified as Best Presentation in session

Pantazes, R.J., J. Riefert and P.S. Daugherty. "Using Deep Sequencing Data to Characterize Immune Repertoires." Annual Meeting of the American Institute of Chemical Engineers, Atlanta, GA, November 16-21, **2014**

Li, T., **R.J. Pantazes** and C.D. Maranas. "OptMAVEn: De Novo Design of Antibody Variable Regions." Annual Meeting of the American Institute of Chemical Engineers, Atlanta, GA, November 16-21, **2014**

Pantazes, R.J. and C.D. Maranas, "*De novo* computational design of fully human antibody variable domains," Annual Meeting of the American Institute of Chemical Engineers, San Francisco, CA, November 3-8, **2013**

Pantazes, R.J. and C.D. Maranas, "Development of computational methods to support *de novo* antibody design," Annual Meeting of the American Institute of Chemical Engineers, Pittsburgh, PA, October 28 - November 2, **2012**

Pantazes, R.J. and C.D. Maranas, "A computational model of VDJ recombination for antibody design," Spring National Meeting & Exposition of the American Chemical Society, San Diego, CA, March 25-29, **2012**

Pantazes, R.J. and C.D. Maranas, "Computational techniques for the *de novo* design of antibodies," Annual Graduate Research Symposium, State College, PA, September 20, **2011**

Pantazes, R.J. and C.D. Maranas, "OptCDR: a computational framework for the design of complementarity determining regions for targeted epitope binding," 7th Annual Protein Engineering Summit, Boston, MA, May 9-13, **2011**

Pantazes, R.J. and C.D. Maranas, "Computational methods for designing antibodies," Graduate Recruiting Weekend, University Park, PA, February 10-13, **2011**

Pantazes, R.J. and C.D. Maranas, "Computational antibody design by canonical structure identification and optimal amino acid selection," Annual Meeting of the American Institute of Chemical Engineers, Nashville, TN, November 8-13, **2009**

Pantazes, R.J. and C.D. Maranas, "Optimal protein library design using recombination or point mutations based on sequence-based scoring functions," Annual Meeting of the American Institute of Chemical Engineers, Philadelphia, PA, November 16-21, **2008**

Teaching Experience

- CHEN 3600, *Computer-Aided Chemical Engineering*, Fall 2016
- Teaching Assistant, *Mathematical Modeling in Chemical Engineering*, Spring 2010
- Teaching Assistant, *Mathematical Modeling in Chemical Engineering*, Spring 2011