

# Karly Jacobsen

**Address** 868 Neil Avenue, Columbus, OH 43215 • **Phone** (904) 534-6363 • **Email** karlyj@gmail.com

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## SUMMARY

Expertise in mathematical model formulation, analysis and interpretation for biological systems. Solid fundamentals in numerical computation, optimization, and data manipulation. Proven skills in leadership, multidisciplinary collaboration, and communication. Self-directed learner with high attention to detail.

## EDUCATION

<b>Ph.D. Mathematics</b>	May 2013
UNIVERSITY OF FLORIDA Gainesville, FL	GPA 4.00
<b>M.S. Mathematics</b>	May 2010
UNIVERSITY OF FLORIDA Gainesville, FL	GPA 4.00
<b>B.S. Materials Science &amp; Engineering</b>	May 2007
UNIVERSITY OF FLORIDA Gainesville, FL	GPA 4.00

## EXPERIENCE

<b>Ohio State University: Mathematical Biosciences Institute</b>	2013 – present
<i>Postdoctoral fellow</i>	Columbus, OH
<ul style="list-style-type: none"><li>• Collaborated on five interdisciplinary modeling projects with mathematicians, statisticians, and clinicians</li><li>• Developed a partial differential equations model for the immune response to tumor virotherapy and performed <i>in silico</i> experiments to predict efficacy of potential combination therapies</li><li>• Formulated epidemic models and pioneered a metric to improve prediction of disease outbreaks on networks</li><li>• Performed parameter estimation for various models using preclinical and epidemiological time-series data</li><li>• Effectively communicated results in four research publications and over 20 presentations to diverse audiences</li></ul>	
<b>University of Florida: Department of Mathematics</b>	2008 – 2013
<i>Fellow, research assistant, teaching assistant, course coordinator</i>	Gainesville, FL
<ul style="list-style-type: none"><li>• Constructed the first predictive model for an innovative tumor therapy and developed simulation algorithm</li><li>• Built and analyzed an ODE model to provide insight on the agricultural management of a citrus disease</li><li>• Effectively taught 19 undergraduate mathematics course sections with class sizes from 16 to over 200</li><li>• Managed team of course instructors, spearheaded curriculum redesign and authored a royalty-generating textbook supplement for the AIM Mathematics Program</li></ul>	
<b>University of Florida: Biomaterials Center</b>	2005 – 2007
<i>Undergraduate research assistant</i>	Gainesville, FL
<ul style="list-style-type: none"><li>• Synthesized and characterized DNA microspheres for optimal drug uptake during intratumoral chemotherapy</li><li>• Performed statistical analysis of microsphere particle size data using SigmaStat software</li></ul>	

## INDUSTRY EXPERIENCE

<b>Johnson &amp; Johnson Vision Care</b>	June – August 2006
<i>Intern, Process and product development engineer</i>	Jacksonville, FL
<ul style="list-style-type: none"><li>• Developed test method and collected hydrogel swelling data for contact lens processing</li><li>• Analyzed data, presented results and actively participated in project team meetings with process engineers</li></ul>	

## SKILLS & COURSES

R	Matlab	Numerical optimization	Probability theory	Applied differential equations
Git	LaTeX	Parameter estimation	Stochastic models	Statistical learning

## PUBLICATIONS

- K. Jacobsen**, M. Burch, J. Tien and G. Rempala. *The large graph limit of a stochastic epidemic model on a dynamic multilayer network*. Submitted to J. Math. Biol.
- M. Burch, **K. Jacobsen**, J. Tien and G. Rempala. *Network-based analysis of a small Ebola outbreak*. Math. Biosci. (in press).
- K. Jacobsen**, L. Russell, B. Kaur and A. Friedman. 2015. *Effects of CCN1 and macrophage content on glioma virotherapy: A mathematical model*. Bull. Math. Biol. (77): 984-1012.
- K. Jacobsen** and S. S. Pilyugin. 2015. *Analysis of a mathematical model for tumor therapy with a fusogenic oncolytic virus*. Math. Biosci. (270): 169-182.
- K. Jacobsen**, J. Stupiansky, and S. S. Pilyugin. 2013. *Mathematical modeling of citrus groves infected by huanglongbing*. Math. Biosci. Eng. 10 (3): 705-728.

## SELECT PRESENTATIONS

- A modeling framework for an epidemic with multiple modes of transmission on a dynamic network*. University of Pittsburgh, Applied Mathematics Seminar, Pittsburgh, PA. March 2016.
- Residence time and epidemics on networks*. University of Florida, Biomathematics Seminar, Gainesville, FL. March 2015.
- Modeling disease spread on networks with a new notion of distance*. Ohio Wesleyan University Science Lecture Series, Delaware, OH. January 2015.
- Modeling the effects of macrophage content and CCN1 on glioma virotherapy*. Mathematical Biosciences Institute, Cancer and the Immune System Workshop, Columbus, OH. November 2014.
- The role of CCN1 in glioma virotherapy with oncolytic herpes simplex virus*. European Conference on Mathematical and Theoretical Biology, Gothenburg, Sweden. June 2014.
- Chronic myeloid leukemia: who can cease TKI treatment?* Moffitt Cancer Center, Integrated Mathematical Oncology Personalized Medicine Workshop, Tampa, FL. November 2013.

## AWARDS

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|---------------------------------|---|------|
| Graduate Student Teaching Award | <i>University of Florida Department of Mathematics</i>                  | 2012 |
| Best Poster Award               | <i>African Institute for Mathematical Sciences modeling workshop</i>    | 2012 |
| Eleanor Ewing Ehrlich Award     | <i>Outstanding female graduate student in mathematics</i>               | 2011 |
| Grinter Fellow                  | <i>University of Florida Department of Mathematics</i>                  | 2008 |
| Alpha Sigma Mu National Scholar | <i>Single nationwide recipient from materials science honor society</i> | 2006 |

## LEADERSHIP

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|-----------------------------|---|-------------|
| <b>Organizer</b>            | Mathematical Biosciences Institute Professional Development Seminar | 2014 – 2015 |
| <b>MBI Representative</b>   | Field of Dreams Conference, Mesa, Arizona                           | 2014        |
| <b>Treasurer and mentor</b> | University of Florida Graduate Mathematics Association              | 2012        |
| <b>President</b>            | University of Florida Chapter of Alpha Sigma Mu                     | 2006 – 2007 |
| <b>Co-vice president</b>    | University of Florida Chapter of Habitat for Humanity               | 2003 – 2006 |

## TRAINING & WORKSHOPS

- Modeling the Spread and Control of Ebola in West Africa*. Atlanta, GA. January 2015.
- Cancer and the Immune System*. Mathematical Biosciences Institute, Columbus, OH. November 2014.
- Parameter Estimation for Dynamic Biological Models*. National Institute for Mathematical and Biological Synthesis, Knoxville, TN. May 2014.
- Integrated Mathematical Oncology Personalized Medicine*. Moffitt Cancer Center, Tampa, FL. November 2013.
- Mathematical Methods in Systems Biology and Population Dynamics*, African Institute for Mathematical Sciences, Cape Town, South Africa. January 2012.