Ericka Keef   Curriculum Vitae

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EDUCATION

Ph.D. in Computational Biology   September 2011 – April 2016
University of Pittsburgh   Pittsburgh, PA
Dissertation: "Interactions between the immune system, influenza A virus, and bacterial pneumonia".

B.S. in Biomedical Engineering, Minor in Mathematics   May 2011
Western New England University   Springfield, MA
Graduated summa cum laude

BIBLIOGRAPHY

- **Keef E,** Zhang LA, Swigon D, Urbano A, Ermentrout GB, Matuszewski M, Toapanta FR, Ross TM, Parker RS, Clermont G. Discrete dynamical modeling of influenza infection suggests age-dependent differences in immunity. J Virol, 2017; 00395-17.
- **Keef E.** Interactions between the immune system, influenza A virus, and bacterial pneumonia. Dissertation, University of Pittsburgh, 2016.
- **Mochan-Keef E**, Swigon D, Ermentrout GB, Clermont G. A Three-Tiered Study of Differences in Murine Intrahost Immune Response to Multiple Pneumococcal Strains. PLoS One. 2015;10: e0134012.
- Price I, **Mochan-Keef E***, Swigon D, Ermentrout GB, Lukens S, Toapanta FR, et al. The inflammatory response to influenza A virus (H1N1): An experimental and mathematical study. J Theor Biol. 2015;374: 83–93. **[*co-first authorship]**
- **Mochan E**, Swigon D, Ermentrout GB, Lukens S, Clermont G. A mathematical model of intrahost pneumococcal pneumonia infection dynamics in murine strains. J Theor Biol. 2014;353: 44–54.

INVITED TALKS AND MEETING PRESENTATIONS

Society of Critical Care Medicine Meeting   February 2016
Poster presentation: "Discrete dynamical modeling of intrahost influenza infection
suggests age-dependent differences in immune response"

Drug Discovery, Systems and computational Biology (DiSCoBio) Summer Academy   July 2015
Oral presentation: "Mathematical Biology and Influenza"

Computational Biology Program Student Seminar   September 2014
Oral presentation: "A three-tiered study of differences in murine intrahost immune
response to multiple pneumococcal strains"

MIDAS summer REU program   June 2014
Oral presentation: "Influenza-Pneumonia Superinfection"

MIDAS National Network Meeting   April 2014
Poster presentation: "A mathematical model of intrahost pneumococcal pneumonia
infection dynamics in murine strains"

Computational Biology Program Student Seminar   January 2014
Oral presentation: "An ODE model of influenza-pneumonia superinfection"

Cell and Systems Biology course   November 2013
Oral presentation: "Parameter estimation of ODEs: MCMC sampling and
ensemble models"

Computational Biology Program Student Seminar   April 2013
Oral presentation: "An ordinary differential equation model of pneumococcal
infection in multiple strains of mice"

TEACHING AND MENTORING EXPERIENCE

Quantitative Reasoning Instructor   August 2016 – present
Carlow University Mathematics Department
- Teach Quantitative Reasoning (SKQ 101) to 3-4 sections of 25-35 students in each of the fall and spring semesters. Students from all majors are required to take the course, so course content needs to be applicable to students from STEM and non-STEM majors and backgrounds.
- Create all lecture notes, homework assignments, classwork problems, exams, and lesson plans.
- Grade all homework assignments and exams.
- Work with learning management system (Schoology).

Calculus I Instructor   August 2017 – present
Carlow University Mathematics Department
- Teach Calculus I to 1 section of about 25 students in fall and spring semesters. Students are typically math, biology, or chemistry majors in this course. Material covers limits, derivatives, applications of derivatives, and integration.
- Create all lecture notes, homework assignments, classwork problems, exams, and lesson plans.
- Grade all homework assignments and exams.

First-Year Seminar Instructor   August 2017 – present
Carlow University, Connecting-to-Carlow program
- Facilitate 1 section of 15 students in fall semesters. Students are from a variety of majors.
- Material covers study skills, resume building, course scheduling, and career readiness.

Research Mentor   September 2015 – June 2017
University of Pittsburgh
- Mentoring two undergraduate students in parameter estimation techniques, including gradient descent methods and Markov chain Monte Carlo simulations.
- Developed MATLAB tutorials for the students on parameter optimization for ordinary differential equation models.

Teaching Assistant, Cellular and Systems Modeling course   September – December, 2012 & 2013
Joint CMU-Pitt Computational Biology Program
- Lectured to about 20 students on Markov Chain Monte Carlo simulations and their applications.
- Designed and graded 2 final exam questions on bifurcation points and stability analysis of systems of ODEs.
- Graded 30 homework questions for each of the 20 students enrolled in the course.
- Led weekly 2-hour recitation periods to teach MATLAB programming and tutor students.

Teaching Assistant, Physics Department   September 2008 – May 2011
Western New England University
- Assisted with Physics 133 (Mechanics) in Fall semesters and Physics 134 (Electricity and Magnetism) in Spring semesters.
- Graded lab reports written by about 24 freshman engineering students after weekly experiments.
- Helped set up and facilitate laboratory experiments.

Future Faculty trainee   September 2014 – April 2016
Carnegie Mellon University   Pittsburgh, PA
Eberly Center Future Faculty program
- Designed a syllabus for a potential future course, "Introduction to Mathematical Modeling", based on my graduate coursework and research.
- Received feedback on my teaching abilities through a review of a 5 minute lecture on introductory calculus. Lecture was presented to 2 graduate teaching fellows and the video was later reviewed for an analysis of my lecture.
- Learned and implemented effective, high-impact teaching strategies including:
  o Engaging students in active learning
  o Conducting productive and engaging discussions
  o Supporting student learning through good assessment practices
  o Planning and delivering effective lectures

Research Mentor   May – August 2014
University of Pittsburgh
Models of Infectious Disease Agent Study (MIDAS) REU
- Mentored an undergraduate summer student on the development of an ordinary differential equation model of the intrahost immune response to dengue fever.
- Helped the student to fit the 8-equation model to experimental data from human patients infected with dengue virus using parameter estimation functions in MATLAB.

Ethics Mentor   May 2012 – present
University of Pittsburgh
Training and Experimentation in Computational Biology (TECBio) Research Experiences for Undergraduates (REU) Program
- Mentored 4 groups of undergraduate students in the basics of Research Ethics.
- Helped students organize a 20-minute interaction presentation discussing an ethics case study with other summer students.

PROFESSIONAL SERVICE AND SOCIETIES
Member of STEM Education Strategy Committee   August 2016 – present
Carlow University
- Group is working to provide students from diverse backgrounds an excellent STEM education marked by quality instruction, a supportive community, and engagement in STEM communities of practice.
- Member of the subcommittee to submit an S-STEM grant proposal to NSF for funds for scholarships for academically-talented and financially-needy students.