

# Celeste Vallejo

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## School Address

Department of Mathematics  
1400 Stadium Rd.  
University of Florida  
Gainesville, FL 132611

**Email:** [cvallejo@ufl.edu](mailto:cvallejo@ufl.edu)

**Website:** [people.clas.ufl.edu/cvallejo](http://people.clas.ufl.edu/cvallejo)

## RESEARCH INTERESTS

mathematical modeling in biology, stochastic processes, and Little's Law

## EDUCATION

University of Florida, Gainesville, FL

- **Ph.D. Candidate, Mathematics**
- Expected graduation date: **May 2018**
- Advisor: James Keesling, Professor of Mathematics, University of Florida
- **Master of Science, Mathematics** **2015**
- Advisor: James Keesling, Professor of Mathematics, University of Florida
- Thesis title: "Little's Law Applied to a Stochastic Model of Poliomyelitis"
- **Bachelor of Arts, Mathematics** **2013**
- Advisor: James Keesling, Professor of Mathematics, University of Florida
- Thesis title: "Epidemiology of MdSGHV in *Musca domestica*"

## RESEARCH EXPERIENCE

### Research Assistant

*University of Michigan (remote hire)*

**January 2017 - present**

- Assistant to James Koopman, Professor of Epidemiology, University of Michigan
- Constructing an event-driven individual-based model of polio transmission and silent circulation that includes the environment as a source of contamination
- This is joint work with Thomas Hladish, University of Florida

### Research Assistant

*Department of Emergency Medicine, University of Florida*

**January 2017 - present**

- Assistant to J. Adrian Tyndall, Chairman, Department of Emergency Medicine, UF Health
- Perform data analytics that facilitate developing the yearly budget for the Emergency Department and that contribute to publishing IRB-approved studies

### Research Assistant

*Department of Mathematics, University of Florida*

**August 2013 - present**

- Assistant to James Keesling, Professor of Mathematics, University of Florida
- Projects include:
  - *Silent Circulation of Poliovirus in Small Populations*
    - \* This project uses a stochastic microsimulation model to demonstrate the potential of long periods (greater than 5 years) of silent circulation of poliovirus in small populations in the absence of vaccination
    - \* This is joint work with Burton Singer and James Koopman

- *Using Little’s Law in Stochastic Modeling*
  - \* This project focuses on a theoretical development of a Little’s Law analysis of stochastic processes
  - \* We are able to analyze a stochastic network without the usual Markov assumptions
- *The Spread of Aerosolizable Nosocomial Pathogens through the Air*
  - \* We identified the air as a significant contributor to the spread of pathogens in a hospital
  - \* We quantified the relative number of pathogens spread by the air versus through hand-touch sites
  - \* This is joint work with Louis Block, Jo Ann Lee, Ross Ptacek, Nicole Iovine, and J. Glenn Morris, Jr.

**PUBLICATIONS** **Celeste Vallejo**; James Keesling; James Koopman; Burton Singer (in review). Silent Circulation of Poliovirus in Small Populations. *Infectious Disease Modelling*.

Josh Hiller; **Celeste Vallejo**; Leo Betthausen; James Keesling. Characteristic patterns of cancer incidence: Epidemiological data, biological theories, and multistage models. *Progress in Biophysics and Molecular Biology* **2017**, *124*, 41-48.

Josh Hiller; **Celeste Vallejo**; Leo Betthausen; James Keesling. Cancer incidence and the biology of extreme old age. *Integrative Molecular Medicine* **2016**, *4*(1).

**Vallejo, Celeste** and James Keesling, *Epidemiology of MdsGHV in Musca domestica*, <http://www.siam.org/students/siuro/vol7/S01237.pdf> (9 July 2014).

**Vallejo, C.R.**; Lee, J.A.; Keesling, J.E.; Geden, C.J.; Lietze, V.-U.; Boucias, D.G. A Mathematic Model That Describes Modes of MdsGHV Transmission within House Fly Populations. *Insects* **2013**, *4*(4), 683-692.

Lietze, V.-U.; Keesling, J. E.; Lee, J.A.; **Vallejo, C.R.**; Geden, C.J.; Boucias, D.G. Muscavirus (MdsGHV) disease dynamics in house fly populations - how is this virus transmitted and has it potential as a biological control agent?. *J. Invertebr. Pathol.* **2013**, *112*, S40-S43.

**PRESENTATIONS** **Graduate Mathematics Association**, University of Florida (November 2017)  
*“All Models Are Bad, Some Are Useful”* (invited talk)

**CSQUID/CIDID Working Group**, University of Florida (November 2017)  
*Silent Circulation of Poliovirus in Small Populations* (invited talk)

**MIDAS group meeting**, University of Michigan (October 2017)  
*Individual-Based Modeling of Silent Circulation of Poliovirus* (invited talk)

**Biomathematics Seminar**, University of Florida (October 2017)  
*Silent Circulation of Poliovirus in Small Populations* (talk)

**Fall Southeastern Sectional Meeting**, University of Central Florida (September 2017)

*Analyzing a Stochastic Model of Cholera Using Little’s Law* (talk)

**MIDAS Network Meeting**, Atlanta, GA (May 2017)

*Silent Circulation of Poliovirus in Small Populations* (poster)

**2017 Emerging Pathogens Institute Research Day**, Gainesville, FL (February 2017)

*Silent Circulation of Poliovirus in Small Populations* (poster)

**Biomathematics Seminar**, University of Florida (February 2017)

*Silent Circulation of Poliovirus in Small Populations* (talk)  
**Joint Mathematics Meeting 2017**, Atlanta, GA (January 2017)  
*Using Little's Law in Stochastic Modeling* (talk)  
**Biomathematics Seminar**, University of Florida (September 2016)  
*On the Absorption Probabilities and Absorption Times of Finite Homogeneous Birth-Death Processes* (talk)  
**Association for Women in Mathematics Workshop at SIAM 2016**, Boston, MA (July 2016)  
*Little's Law Applied to a Stochastic Model of Poliomyelitis* (poster)  
**Biomathematics Seminar**, University of Florida (January 2016)  
*Using Little's Law in Stochastic Modeling* (talk)  
**Graduate Mathematics Association**, University of Florida (December 2015)  
*Little's Law Applied to a Stochastic Model of Poliomyelitis* (invited talk)  
**Queuing Seminar**, University of Florida (September 2015)  
*Karl Sigman's Proof of Little's Law* (talk)  
**Society for Mathematical Biology 2015 Annual Meeting and Conference**, Georgia State University (June 2015)  
*Stochastic Models for the Silent Circulation of Polio* (poster)  
**Emory University STEM Research and Career Symposium**, Emory University (April 2013)  
*Epidemiology of MdSGHV* (poster)  
**University of Florida's Undergraduate Research Symposium**, University of Florida (March 2013)  
*Epidemiology of MdSGHV* (poster)  
**Florida Undergraduate Research Conference**, University of Florida (February 2013)  
*Epidemiology of MdSGHV* (poster)

**WORKSHOPS ATTENDED**      **Uncertainty Quantification for Biological Models Tutorial**, NIMBioS at the University of Tennessee, Knoxville (June 2017)

**TEACHING EXPERIENCE**      **Department of Mathematics**, University of Florida  
*Discussion Leader*, Analytic Geometry and Calculus I (Fall 2016)  
*Discussion Leader*, Analytic Geometry and Calculus I (Spring 2016)  
*Discussion Leader*, Analytic Geometry and Calculus I (Fall 2015)

**FELLOWSHIPS AND GRANTS**      Fall 2017 Graduate Travel Award (2017)  
SEARCDE 2016 Travel Grant (2016)  
Association for Women in Mathematics Travel Grant (2016)  
Center for Applied Mathematics Travel Support (UF) (2016)  
Landahl Travel Grant (Society for Mathematical Biology) (2015)  
College of Liberal Arts and Sciences Graduate Student Travel Grant (UF) (2015 & 2016)  
The Bridge to Doctorate Fellowship (2013-2015)  
University Scholars Program (University of Florida research grant) (2012-2013)

**TECHNICAL SKILLS**      C++, Wolfram *Mathematica*, LaTeX, MATLAB, R

**PROFESSIONAL AFFILIATIONS**      Center for Inference & Dynamics of Infectious Diseases  
VectorBiTE

**MATHEMATICS** Biomathematics Seminar Coordinator (Fall 2016 - present)  
**DEPARTMENT** Graduate Mathematics Association Secretary (Fall 2016)  
**SERVICE** Graduate Mathematics Association Webmaster (Spring 2015 - Fall 2015)  
Graduate Student Mentor (Fall 2014 - Spring 2017)