

**Edgar W. Delgado-Eckert**  
RESEARCH GROUP LEADER IN COMPUTATIONAL PHYSIOLOGY,  
BIOMATHEMATICS AND BIOSTATISTICS  
**UNIVERSITY CHILDREN'S HOSPITAL**  
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BASEL, SWITZERLAND

## Contact

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## Education

July 2008 – October 2011

### Postdoctoral Researcher

Department of Biosystems Science and Engineering (BSSE)  
Swiss Federal Institute of Technology (ETH Zürich).

May 2008

**Ph.D. (Bio-)Mathematics** (Magna Cum Laude), Technische Universität München, Germany.

Major: Mathematics

Minor: Biology

2002

**M.S. Mathematics** (German Diplom-Mathematiker Univ.), Technische Universität München, Germany.

Major: Mathematics

Minor: Physics

## Research Experience

November 2011 – Present

**Research group leader**, *University Children's Hospital, University of Basel*  
Projects with Prof. Dr. Urs Frey (University of Basel), Prof. Dr. Nicole Probst-Hensch (Swiss TPH), Prof. Dr. Sven Schulzke (University of Basel), Prof. Dr. Carmen Molina-Paris and Dr. Vas Ponnambalam (University of Leeds, UK), Dr. Annemie Boehmer (Rotterdam, Netherlands), Prof. Dr. David Thorley-Lawson (Tufts University, Boston), among others. Examples of research projects:

- Correlation properties of spontaneous motor activity and neurological maturation in infants.
- Clustering analysis using peak respiratory flow and forced expiratory volume data to characterize asthma patients.
- Assessing therapy response in children with severe asthma based on daily lung function.
- Analysis of temperature time series in preterm infants to study temperature regulation during development.
- Establishing associations between temporal fluctuations in heart rate variability and air pollution and tobacco smoke exposure.
- Spatio-temporal modeling of air pollution levels in the Canton Bern and the city of Bern. Proteomic analysis of vegetation subject to drought and air pollution.
- Stochastic modeling of the molecular mechanisms involved in angiogenesis.

July 2008 – October 2011

### Postdoctoral Fellow, BSSE, ETH Zürich

Projects with Prof. Dr. Niko Beerenwinkel, Dr. Gunter Merdes, (ETH Zürich) Prof. Dr. Michael Shapiro (Tufts University), Dr. Samuel Ojosnegros (Cal. Tech.)

- Reconstruction of signaling pathways from RNAi screens.
- Quantitative assessment of redundancy in protein interaction networks. Computational prediction of genetic interactions.
- Mathematical modeling of viral infection and viral competition.
- Epidemics on social networks.

## Research Experience

August 2006 – January 2008

**Graduate Research Assistant**, *Pathology Department, Tufts University, Boston*

Project PathSim: An agents-based model and simulation of Epstein-Barr virus infection in humans. Prof. Dr. David Thorley-Lawson, Dr. Michael Shapiro, Prof. Dr. Karen Duca.

October 2004 – July 2006

**Research Fellow**, *Virginia Bioinformatics Institute at Virginia Tech, Virginia, USA*

Project: Reverse engineering of time discrete finite dynamical systems. Applications to modeling biological phenomena. Prof. Dr. Reinhard Laubenbacher.

August 2003 – December 2003

**Research Associate**, *Institute for Product Development, Department of Mechanical Engineering at the Technische Universität München, Germany*

Project: Case-based-reasoning techniques for product customization. Prof. Dr.-Ing. U. Lindemann, Dr. Dipl.-Ing. Josef Ponn.

## Teaching Experience

Fall Semester 2012/2013

### Lecturer

*Ordinary Differential Equations for Engineers*. School for Life Sciences, University of Applied Sciences and Arts Northwestern Switzerland (FHNW), Basel.

Spring 2009, Spring 2010, Spring 2011

### Teaching Assistant

*Statistical models in computational biology*. With Prof. Niko Beerenwinkel, BSSE, ETH Zürich.

Spring 2010, Fall 2010

### Teaching Assistant, tutoring of projects, supervision of PhD student

*Systems Biology*. With Prof. Dr. Niko Beerenwinkel and Prof. Dr. Renato Paro, BSSE, ETH Zürich.

Fall 1997, Summer 1998

### Teaching Assistant

*Linear algebra and calculus*. With Apl. Prof. Dr. J. Hartl, Center for Mathematical Sciences at the Technische Universität München, Germany.

## Work Experience

Summer 1999, Fall 2000

### Mathematical Consultant

Designed and implemented algorithms for streamlining industrial applications. OPEN MIND Software Technologies, Unterföhring, Germany.

## Honors, Awards, and Funding

November 2012

Marie Curie Actions— International Research Staff Exchange Scheme (IRSES)  
Grant duration: 48 months, starting 2013. Amount: 23'100.00 Euros.

November 2012

Promotional grant for junior scientists from the University of Basel. Grant duration: One time 45000 CHF grant, starting 2013.

## Honors, Awards, and Funding

October 2012  
Marie Curie Intra-European Fellowship For Career Development (IEF).  
Duration: 24 months, starting 2013. Amount: 209'033.40 Euros

July 2012  
*Landahl travel award* of the Society for Mathematical Biology.

June 2011  
*Travel award* of the European Society for Mathematical and Theoretical Biology.

July 2010  
*Landahl travel award* of the Society for Mathematical Biology.

October 2003 - March 2006  
*Graduate research fellowship* from the Bavarian State.

## Professional Affiliations

- European Society for Mathematical and Theoretical Biology.
- Society for Mathematical Biology.
- Society for Advancement of Chicanos and Native Americans in Science.

## Languages

- **Spanish:** Fluent.
- **English:** Fluent.
- **German:** Fluent.
- **French:** Basics.

## Programming Skills

- Programming in MATLAB<sup>®</sup>, R, MAPLE<sup>®</sup>, C and PERL<sup>®</sup>.
- Programming in HTML, Web Publishing.

## University Service

Fall Semester 2009/10 – Summer Semester 2011

Official Representative of scientific assistants, postdoctoral fellows and PhD students at the Department of Biosystems Science and Engineering, ETH Zürich.

Fall Semester 2005/6, Spring Semester 2006

Vice-president of the Student Chapter of the Society of Industrial and Applied Mathematics (SIAM) at Virginia Tech.

## Additional Training

Leading & Managing in the New Academic Environment: Building & Developing a Positive Team Environment. Staff and Departmental Development Unit (SDDU), University of Leeds, 2015.

Leading & Managing in the New Academic Environment: Managing Sources of Conflict & Difficult Situations. SDDU, University of Leeds, 2015.

Effective Research Student Supervision in Science, Engineering and medically-related disciplines. SDDU, University of Leeds, 2014.

Ethics and Ethical Review. SDDU, University of Leeds, 2014.

Personal Impact and Confident Networking. SDDU, University of Leeds, 2014.

Work and time management. ETH Zurich, Fall Semester 2009.

Summer School in Mathematical Biology (Park City Mathematics Institute 2005, Utah) under the auspices of the Institute for Advanced Study, Princeton University.

**Conference  
contributions  
and invited  
talks**

Delgado-Eckert, E. (July 2016) *Epistasis on networks*. Invited presentation at the Computational Biomechanics Summer School of the Department of Biomedical Engineering at the University of Basel, Engelberg, Switzerland.

Delgado-Eckert, E. et al. (November 2015) *Mathematical modeling of a cyclic multistage pathogen. Applications to Epstein-Barr virus infection in humans*. Invited presentation at the 3rd Workshop and Conference on "Modeling Infectious Diseases" organized by The Institute of Mathematical Sciences (IMSc), Chennai, India.

Delgado-Eckert, E. (November 2015) *Epistasis on networks*. Invited presentation at the Applied Mathematics seminar in the School of Mathematics and Statistics at the University of Glasgow, UK.

Delgado-Eckert, E. et al. (September 2015) *Asthma phenotypes determined by a novel fluctuation based clustering method using a time window of lung function observations*. Contributed talk at the European Respiratory Society (ERS) International Congress, Amsterdam, The Netherlands.

Delgado-Eckert, E. (August 2013) *The cycle of EBV infection explains persistence, the sizes of the infected cell populations and which come under CTL regulation*. Invited presentation at Los Alamos National Laboratory, Theoretical Division, Theoretical Biology and Biophysics Group, Los Alamos, New Mexico, USA.

Delgado-Eckert, E. (July 2012) *Epistasis on networks*. Contributed talk at the 2012 Annual Meeting of the Society for Mathematical Biology, Knoxville, Tennessee, USA.

Delgado-Eckert, E. (February 2012) *The evolution of virulence in RNA viruses under a competition-colonization trade-off*. Invited presentation at the Departamento de Estadística e Investigación Operativa I, Facultad de Ciencias Matemáticas, Universidad Complutense Madrid, Spain.

Delgado-Eckert, E. (July 2011). *A model of host response to a multi-stage pathogen*. Invited presentation at the Department of Applied Mathematics, University of Leeds, UK.

Delgado-Eckert, E. (June 2011). *A model of host response to a multi-stage pathogen*. Contributed talk at the 8th European Conference on Mathematical and Theoretical Biology, and 2011 Annual Meeting of The Society for Mathematical Biology, Kraków, Poland.

Delgado-Eckert, E. (April 2011). *A model of host response to a multi-stage pathogen*. Poster presented at the Workshop "Physics of Immunity: Complexity Approach" at the Max Planck Institute for the Physics of Complex Systems, Dresden, Germany.

Delgado-Eckert, E. (March 2011) *The evolution of virulence in RNA viruses under a competition-colonization trade-off*. Invited presentation at the Max Planck Institute for the Dynamics of Complex Technical Systems, Magdeburg, Germany.

**Conference  
contributions  
and invited  
talks**

Delgado-Eckert, E., Shapiro, M. (October 2010). *A model of host response to a multi-stage pathogen*. Poster presented at the 11<sup>th</sup> International Conference on Systems Biology, Edinburgh, UK.

Delgado-Eckert, E., Gill, S., Merdes, G., Beerenwinkel, N. (September 2010). *Predicting genetic interactions by quantifying redundancy in biochemical pathways*. Poster presented at the 9<sup>th</sup> European Conference on Computational Biology, Ghent, Belgium.

Delgado-Eckert, E. (July 2010) *The evolution of virulence in RNA viruses under a competition-colonization trade-off*. Contributed talk at the 2010 Annual Meeting of the Society for Mathematical Biology, Rio de Janeiro, Brazil.

Delgado-Eckert, E. (April 2010) *The evolution of virulence in RNA viruses under a competition-colonization trade-off*. Invited presentation at the Pasteur Institute, Paris.

Delgado-Eckert, E., Merdes, G., Beerenwinkel, N. (June 2009) *Quantifying Redundancy in Signaling Pathways from Perturbation Experiments*. Poster presented at the 7<sup>th</sup> Basel Computational biology Conference 2009, Switzerland.

Delgado-Eckert, E. (March 2008) *A Virtual look at Epstein-Barr virus infection*. Invited presentation at the Broad Institute of MIT and Harvard University, Boston.

Delgado-Eckert, E. (2007) *Canonical representatives for residue classes of a polynomial ideal and orthogonality*. Invited presentation at the Mathematics Department at the University of Puerto Rico, Mayagüez.

Delgado-Eckert, E., Castiglione, F. (2006), *Equation-based approximation of agent based models*. Poster presented at the VBI 1st Annual Research Symposium, March 2006, Virginia Tech, Blacksburg, Virginia.

Astorga, L., Delgado-Eckert, E. *A brief introduction to Catastrophe Theory*. Presented during the XII Jornadas Matemáticas Venezolanas, March 1999, Escuela de Matemática, UCV, Caracas, Venezuela.