

RAFAEL PEÑA-MILLER

Postdoctoral Research Associate
Department of Zoology
University of Oxford
OX1 3PS

rafael.pena-miller@zoo.ox.ac.uk
<http://www.penamiller.com>

+44 (0) 7578 296357

EDUCATION

- 2007-2011 **PhD Mathematics**
Department of Mathematics, Imperial College London, supervised by Robert Beardmore.
- 1999-2005 **BSc Mathematics**
Faculty of Sciences, UNAM. Thesis supervised by Pablo Padilla.

POST-DOCTORAL RESEARCH

- 2013-present **Department of Zoology, University of Oxford**
Post-doctoral Research Associate
- 2011-2013 **Biosciences, University of Exeter**
Post-doctoral Research Fellow

HONORS AND AWARDS

- 2013 **Lee Segel Prize**
Awarded by the Society of Mathematical Biology to the best paper published
- 2012 **Merit Award**
University of Exeter
- 2011 **Bicentennial Award for Excellence in Postgraduate Research**
Awarded by the Secretary for Public Education - Mexico
- 2010 **IDEA League Fellowship**
- 2007-2011 **Scholarship for Doctoral Studies**
CONACYT - Mexico

PEER-REVIEWED PUBLICATIONS

10. When the most potent combination of antibiotics selects for the greatest bacterial load: the smile frown transition.

R. Peña-Miller, Löhnemann, Jansen, Fuentes-Hernandez, Rosenthal, Schulemburg and Beardmore.
PloS Biology, 11(4): e1001540 (2013).

9. The optimal deployment of synergistic antibiotics: a control-theoretic approach.

R. Peña-Miller, D. Löhnemann, H. Schulemburg, M. Ackermann and R. Beardmore
Royal Society Interface, Vol 9, No. 75 pp. 2488-502 (2012).

8. Selecting against antibiotic-resistant pathogens: optimal treatments in the presence of commensal bacteria.

R. Peña-Miller, D. Löhnemann, H. Schulemburg, M. Ackermann and R. Beardmore
Bulletin of Mathematical Biology, Vol 74, No. 4 pp. 908-943 (2011).

7. Single-cell time-lapse analysis of depletion of the universally conserved essential protein YggD.

T. Bergmiller, R. Peña-Miller, A. Boehm and M. Ackermann.
BMC Microbiology, Vol 11, No. 118 (2011).

6. Antibiotic cycling versus mixing: the difficulty of using mathematical models to definitively quantify their relative merits.

R. Beardmore and R. Peña-Miller
Mathematical Biosciences and Engineering, Vol 7, No. 4 pp. 923-933 (2010).

5. Rotating antibiotics selects optimally against antibiotic resistance, in theory.

R. Beardmore and R. Peña-Miller
Mathematical Biosciences and Engineering, Vol 7, No. 3 pp. 527-552 (2010).

4. Modelling cognitive decline in the Hypertension in the Very Elderly Trial [HYVET] and proposed risk tables for population use.

R. Peters, N. Beckett, R. Beardmore, R. Peña-Miller, K. Rockwood, A. Mitnitski, A. Fletcher, C. Bulpitt
PLoS ONE 5(7): e11775 (2010)

3. uvby- β photoelectric photometry of Cepheid stars.

J. H. Peña, A. Arellano-Ferro, R. Peña-Miller, M. Alvarez, Y. Rosas, H. Garcia, G. Muñoz, B. Vargas, J.P. Sareyan, C.A. Guerrero and A. Renteria.
RevMexAA, vol 46, No. 2, pp. 291–308, (2010).

2. Physical Parameters of seven field RR Lyrae stars in Bootes

J.H. Peña, A. Arellano Ferro, R. Peña Miller, J.P. Sareyan and M. Alvarez
RevMexAA, vol 45, No. 2, pp. 191-204, (2009).

1. D115520, a new δ Scuti Star.

J. H Peña, J. P Sareyan, B. Cervantes-Sodi, R. Peña-Miller, M. Álvarez, M. Cano y M. Sorcia
RevMexAA vol. 43, No. 1, pp. 217-224 (2007)

POSTERS AND PRESENTATIONS

[Plenary speaker] *Society of Mathematical Biology – Annual Meeting and Conference*, USA, June 2013.

[Invited talk] *Mathematical Congress of the Americas*, CIMAT, Mexico, August 2013.

[Invited talk] *Image Processing Workshop*, Exeter Imaging Network, UK, March 2013.

[Contributed talk] *Multiscale Modelling in Medicine and Biology*, Nottingham, UK, September 2012.

[Invited talk] *Antibiotic-Resistant Infections Workshop*, University of Miami, USA, December 2011.

[Invited talk] *Mathematics in Emerging Disease Management*, CIC, Mexico, January 2011.

[Contributed talk] *North American Meeting on Industrial and Applied Maths*, Mexico, December 2010.

[Invited talk] University of Kiel, Germany, September 2010.

[Invited talk] ETH-Zurich, Switzerland, November 2009.

[Poster] *Evolution of Stress Responses*, University of Aberdeen, September 2009.

[Poster] *12th Congress of the European Society for Evolutionary Biology*, Turin, Italy, August 2009.

[Poster] *BICS Conference: Multiply Structured Populations in Biology*, University of Bath, July 2009.

[Poster] *Evolution of Antimicrobial Resistance Workshop*, Imperial College London, January 2009.

CONFERENCES AND COURSES ATTENDED

European iGEM Jamboree (Amsterdam, Netherlands, October 2012).

Short read genomics: Remapping (Exeter Academy, Biosciences, March-June 2012).

3rd Workshop in Theoretical Biology (Max Planck Institute, Plön, Germany, February 2011).

Evolution of Microbial Cooperation (University of Bath, UK, January 2011).

Autumn Symposium on Systems and Synthetic Biology (Imperial College, November 2010).

Theoretical and Empirical Population Genetics (Max-Planck Institute, Germany, September 2010).

Summer School: The Physics of Evolution (UCSD, USA, August 2010).

SMIDDY: Swiss Meeting for Infectious Disease Dynamics (Bern, Switzerland, May 2010).

Symposium in Evolutionary Biology (Institute of Integrative Biology, ETH-Zurich, May 2010).

Coevolution: Models and Microbial Model Systems (University of Liverpool, UK, April 2010).

Host-parasite Co-evolution Workshp (Kiel, Germany, February 2010).

Mathematical Models, Microbes & Evolution Meeting (NESCent, USA, July 2009).

Bifurcation-Theoretic Computations for Density Functional Theory (Madrid, Spain, April 2009).

1st Elgersburg School on Mathematical Systems Theory (TU Ilmenau, Germany, April 2009).

Evolution of Stochastic Gene Expression Workshop (University of Liverpool, UK, December 2007).

International Genetically Engineered Machine Competition (MIT, USA, November 2006).

Summer School on Systems Biology Dynamics (McGill, Canada, July 2006).

V Autumn School in Mathematical Biology (UAZ, Mexico, November 2003).

ACADEMIC ACTIVITIES

Exeter Imaging Network (*Co-ordinator, 2011-2012*)

Quantitative Evolutionary Dynamics Workshop (*Co-organiser, April 2013*)

iGEM: The international Genetically Engineered Machine competition (*Instructor, 2012*)

Mathematics of Microbes: Biological Details of the Evolving Cell (*Workshop co-organiser, April 2011*)

Mathematical Models and Experimental Microbial Systems (*Administrative support, 2009-2011*)

Journal of the European Optical Society: Rapid Publications (*IT Manager, 2007-2010*)