Maria Abou Chakra

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Positions Held

Current, from July 2016

Research Associate
University of Toronto, Canada
Donnelly Centre for Cellular and Biomolecular Research
Mathematical modelling of human tissue development as part of the Medicine by Design Project. Modelling intestinal development in an organoid.

Jan 2011-July 2016

Post-Doctoral Researcher
Max Planck Institute, Plön, Germany
Dep. of Evolutionary Theory
Using Evolutionary Game theory to understand the emergence of complex interactions.

2013-2015

Anthony (5.2013) & Olivia (1.2016)
Part-time and Maternity
I have worked part-time or taken maternity leave during these years.

2002-2010

Research Assistant
McMaster University, Hamilton
Dep. of Biology, Dr J. Stone (2004-2010)
Studied the morphological disparity in echinoid skeletons.
Dep. of Math. and Stats., Dr M. Lovric (2002-2005)
Summarized survey results from educational research.
Dep. of Health Science, Dr J. Bain (2002-2004)
Studied the effects of tension on the various cell layers surrounding a nerve fibre.

2000-2010

TeachingAssistant
McMaster University, Hamilton
Dep. of Biology (2004-2010)
Dep. of Mathematics and Statistics (2000-2004)
Graded students and conducted tutorials.

2000-2005

Material Curator and Programmer
AECON:AGI Traffic Tech, Scarborough
Designed and created billing and material tracking programs.
McMaster University, Hamilton
Created a protocol for a mark calculating program.

Education

2006-2010	**Doctor of Philosophy** Computational Biology *Dep. of Biology. McMaster University* Thesis: Modelling echinoid skeletal growth and form
2004-2005	**M.Sc., Transferred to Ph.D.**
1999-2003	**Honors Bachelors of Science** General Biology *Dep. of Biology. McMaster University*

Computational Experience

1994-present	Programming: QBasic, Visual Basic, VBA(Microsoft Office Certified), C, C++, bash, and awk
2004-present	Mathematica Certification for Mathematica Advance Level Foundation

Teaching Experience

2011-2014	**Max-Planck Institute** *Lecturer:* designed and presented a course to introduce modelling of biological systems. I offered the course yearly.
Feb. 2013	**Lübeck University** *Co-lecturer:* presented a lecture on evolutionary game theory as it applies to host-parasite system.
2004-2009	**McMaster University** *Biology Teaching Assistant:* Third year Evolution, Vertebrate Anatomy, and Animal Physiology.
2000-2004	**McMaster University** *Calculus Teaching Assistant:* Calculus for Engineering I and II, Science I and II, and Social Sciences.

Publications

Valier, M.,**Abou Chakra, M.**, Hindersin, L., Linnenbrink, M., Traulsen A., Baines J. (2017) Evaluating the maintenance of disease-associated variation at the blood group-related gene B4galnt2 in house mice. BMC Evolutionary Biology 17:187 DOI: 10.1186/s12862-017-1035-7

Abou Chakra, M., Lovric, M., Stone, J. R. (2017) Predicting Morphological Disparities in Sea Urchin Skeleton Growth and Form. bioRxiv, doi.org/10.1101/133900

Abou Chakra, M., Hilbe C., Traulsen A. (2016) Coevolutionary interactions between Famers and Mafia induce host acceptance of avian brood parasites. Royal Society Open Science,doi:10.1098/rsos.160036

Haafke, J., **Abou Chakra, M.**, Becks L. (2016) Eco-evolutionary feedback promotes Red Queen dynamics and selects for sex in predator populations. Evolution. 70-3:641-652 d0i:10.11/evo12885

Hagel, K.*, **Abou Chakra, M**.*, Bauer, B., Traulsen, A., (2016) Which risk scenarios can drive the emergence of costly cooperation? Scientific Reports. 6:19269, doi:10.1038/srep19269 * 1^{st} authorship

Abou Chakra, M., Hilbe C. (2015) Modelling the dynamics of crime and punishment: Comment on Statistical physics of crime: A review by M.R. D'Orsogna and M. Perc. Physics of Life Reviews, 12:22-23

Abou Chakra, M., Hilbe C., Traulsen A. (2014) Plastic behaviors in hosts promote the emergence of retaliatory parasites. Scientific Reports, 4:4251, doi:10.1038/srep04251

Mobley K. B., **Abou Chakra, M.**, Jones A. (2014) No evidence for size-assortative mating in the wild despite mutual mate choice in sex-role-reversed pipefishes. Ecology & Evolution. 4:67-78. doi: 10.1002/ece3.907

Abou Chakra, M., Traulsen A. (2014) Under high stakes and uncertainty the rich should lend the poor a helping hand. Journal of Theoretical Biology. 341:123-130. doi: 10.1016/j.jtbi.2013.10.004

Abou Chakra, M., Hall B.K., Stone, J. R. (2013) Using Taxonomists Heads to recapitulate craniate-vertebrate phylogenetic history. Historical Biology doi:10.1080/08912963.2013.825792

Hilbe C., **Abou Chakra, M.**, Altrock P., Traulsen A. (2013) The evolution of strategic timing in collective-risk dilemmas. PloS ONE. 8(6): e66490. doi:10.1371/journal.pone.0066490

Abou Chakra, M., Traulsen A. (2012) Evolutionary dynamics of strategic behavior in a collective-risk dilemma. PloS Computational Biology, 8(8): e1002652 doi:10.1371/journal.pcbi.1002652

Abou Chakra, M., Stone, J. R (2011) Holotestoid: A new echinoid test growth model. Journal of Theoretical Biology, 285:113-125. doi: 10.1016/j.jtbi.2011.06.019

Abou Chakra, M., Stone, J. R. (2011) Classifying skeleton models to test ideas about growth and form. Paleobiology, 37:686-695

Abou Chakra, M., Stone, J. R. (2008) Descartes, Plateau and Sea Urchins. Design and Nature IV, WIT Transactions on Ecology and the Environment, 114:97-105

Professional Service

Active Reviewer for:
Journal of Theoretical Biology
APS Physical Review E
PloS ONE & Computational Biology
BMC Biology

2016- **Medicine by Design: Single Cell and Organoid Groups.** Organise discussions and workshops.

2014- **Unconscious Biases: Equality and Gender Meeting.** Organise discussions and workshops about issues surrounding stereotypes.

2013- **Mentor:** I believe this is lacking in general, so I act as a mentor for several postdocs and graduate students.

2004- **Public Outreach.** Lets Talk Science, I'm a Scientist USA-Evolution..others.

2015-17 **ESEB: Equal Opportunity Committee.** Chair of the subcommittee preparing the official guidelines to improve diversity.

2016 **Bridging theory and experiments**: Co-organised and hosted an international workshop.

2014-16 **Post-Doctoral and PhD representative.** Representative of all the scientists at the instituite.

2009-10 **Faculty of Science Graduate Curriculum and Policy Committee.**

2008-09 **Women In Science and Engineering (WISE).**

2012 **Evolution Conference.** &
2006-09 **Biology Symposium.** Sessional chair, poster and presentation judge.

2006 **Faculty Candidate Search Committee.**

2004-06 **Life Science Art Committee.**