FINLAY MAGUIRE

ACADEMIC ADDRESS
Natural History Museum
Cromwell Road
London
SW7 5BD
+44 (0)20 7942 6322
richardslab.exeter.ac.uk

HOME ADDRESS
7 Albion Place
Exeter
EX4 6LH
+44 (0)77 6989 5717
root@finlaymagui.re
finlaymagui.re

EDUCATION

Doctor of Philosophy (To be completed)
Natural History Museum
University College London October 2011 - Present

Joint institution PhD in Molecular Evolution/Bioinformatics on the reconstruction of cellular interactions in a nascent endosymbiotic system. This resarch is co-supervised by Professor Max Telford (EMBO YIP 2000) at University College London and Dr Thomas Richards (EMBO YIP 2012) at the Natural History Museum. Project is currently being completed as a sitting scientist at the University of Exeter where Dr Richard's lab is now located.

Bachelor of Arts (Honours) Natural Science - Biological Sciences
Oxford University October 2008 - June 2011

Honours schools: Cellular & Developmental Biology and the Biology of Plant & Animal Disease
During this degree I conducted the following independent research:

- The evolution of the folate biosynthesis gene fusions in the eukaryotes (supervised by Dr Thomas Richards) (now published - see publications section below for full citation).
- Explaining the functional diversity of leucine rich repeats (supervised by Dr Adrian Smith).
- A proposal to investigate the exchange of proteins between *Igniococcus hospitalis* and *Nanoarchaeum equitans* (supervised by Professor Ian Moore).

SHORT TERM PROJECTS

National Data Science Bowl December 2014 - March 2015

Participating in a Kaggle machine learning competition focussed on image classification of 121 classes of plankton. Formed part of 6-person team with PhD students from University of Edinburgh. Placed in top $\sim 5\%$ of teams (57/1049) by model averaging several GPU-accelerated deep convolutional neural network models trained using online image augmentation and supplemented with conventional visual feature extraction and hierarchial label classification data.

American Epilepsy Society Seizure Prediction Challenge August - October 2014

Participated in a Kaggle machine learning competition trying to differentiate pre-seizure iEEGs from normal brain activity as part of 3-person team with PhD students from University of Edinburgh. Placed in the top 5% of teams (16/527) using an ensemble of random forest models trained on a range of signal analysis features e.g. multivariate autoregression models and frequency power bands.

NASA Planetary Biology Program July - October 2013

Funded short term research fellowship (10 weeks) with Dr David J. Smith at the Space Life Science Laboratories of NASA's John F. Kennedy Space Centre working on the MIST project. This project involved investigating transcriptomic adaptations of *Bacillus* species to stratospheric conditions as well as sampling microbes in the stratosphere.

BBC Cloud Lab Documentary October 2013

Acted as NASA representative and scientific adviser for the British Broadcasting Company (BBC) 'Cloud Lab' documentary on atmospheric sciences. In this role I created microbial sampling and exposure protocols as well assembling the necessary materials and airship fixtures to conduct these experiments. I additionally briefed Dr Jim McQuaid (University of Leeds) and producers on the relevant microbiological background.

Society for General Microbiology Harry Smith Vacation Studentship June - August 2010

Funded summer research project (9 weeks) with Dr Thomas Richards at the University of Exeter on the evolution of folate biosynthesis gene fusions in the eukaryotes.

BioMAP Egypt July - August 2008

Research assistant (5 weeks) on the BioMAP GIS project monitoring biodiversity in the Sinai desert in association with the University of Nottingham and the Suez Canal University.

AWARDS AND GRANTS

NASA Planetary Biology Program — July - October 2013, John F. Kennedy Space Centre

Competitive award which funded a short term (10 week) research fellowship with Dr David J. Smith at NASA Kennedy Space Centre on bacterial adaptations to extreme conditions (£3500).

Earth and Space Foundation Exploration Award — 2013, John F. Kennedy Space Centre

Awarded for work conducted at NASA Kennedy Space Centre with Dr David J. Smith in the use of terrestrial environments to advance the exploration of space (£300).

FEMS Young Scientist Meeting Grant — 19th-24th October 2013, Sant Feliu de Guixols, Spain

Federation of European Microbiological Societies (FEMS) grant to attend and present at the European Molecular Biology Organisation (EMBO) conference: Comparative Genomics of Eukaryotic Microorganisms 2013 (£350).

FEMS Young Scientist Meeting Grant — 15th-20th October 2011, Sant Feliu de Guixols, Spain

Federation of European Microbiological Societies (FEMS) grant to attend and present at the European Molecular Biology Organisation (EMBO) conference: Comparative Genomics of Eukaryotic Microorganisms 2011 (£350).

Society for General Microbiology Undergraduate Student Grant — 5th-7th September 2011, University of York

Grant for travel and accommodation to attend and present at the Society for General Microbiology (SGM) Summer 2011 conference at the University of York (£170).

Dukinfield Exhibition in Biological Sciences — October 2009-July 2011, Somerville College, Oxford

Awarded and maintained throughout my undergraduate degree for academic excellence (£300).

Society for General Microbiology Harry Smith Vacation Studentship — June 2010-August 2010, University of Exeter

Award funding a summer research project with Dr Thomas Richards at the University of Exeter on the evolution of folate biosynthesis gene fusions in the eukaryotes (£1890).

PUBLICATIONS

"Complex patterns of gene fission in the eukaryotic folate biosynthesis pathway."
Maguire, F., Henriquez, F.L., Leonard, G., Dacks, J.B., Brown, M.W., Richards, T.A.
Genome Biology and Evolution 6, 2709-2720, 2014

"Organelle Evolution: A Mosaic of 'Mitochondrial' Functions"
Maguire, F., Richards, T.A.
Current Biology 24(11), R518-R520, 2014

"Diverse molecular signatures for 'active' Perkinsea in marine sediments"
Chambouvet, A., Berney, C., Romac, S., Audic, S., Maguire, F., de Vargas, C., Richards, T.A.
BMC microbiology 14(1), 110, 2014

"A Balloon-Based Payload for Exposing Microorganisms in the Stratosphere (E-MIST)"
Smith, D.J., Thakrar, P.J., Bharrat, A.E., Dokos, A.G., Kinney, T.L., James, L.M., Khodadad, C.L., Maguire, F., Maloney, P.R., Dawkins, N.L.
Gravitational and Space Research 2 (2), 2014

"Cryptic infection of a broad taxonomic and geographic diversity of tadpoles by Perkinsea protists"
Chambouvet, A., Gower, D.J., Jirku, M., Yabsley, M.J., Leonard, G., Maguire, F., Bittencourt, G., Wilkinson, M., Richards, T.A.
Manuscript in press. Proceedings of the National Academy of Sciences, USA

CONFERENCES AND WORKSHOPS

School of Informatics Jamboree 2015 — 26th March 2015, University of Edinburgh, Edinburgh, United Kingdom

Poster presentation: "Classifying Plankton Species with Deep Learning and Computer Vision"
Graham, M., Gray, G., Lowe, S., Maguire, F., Selega, A., Stanciu, D.
(*Presented in absentia*).

EMBO YIP PhD Course — 2nd-7th December 2013, EMBL, Heidelberg, Germany

European Molecular Biology Organisation Young Investigator PhD course participant.
Oral presentation: "Key endosymbiont proteins implicated in the maintenance of the photosynthetic endosymbiosis between *Paramecium bursaria* and *Chlorella*"
Poster presentation: "Key principles in molecular phylogenetics"

EMBO: Comparative Genomics of Eukaryotic Microorganisms — 19th-24th October 2013, Sant Feliu de Guixols, Spain

Poster presentation: "Key endosymbiont proteins implicated in the maintenance of the photosynthetic endosymbiosis between *Paramecium bursaria* and *Chlorella*".

Molecular Evolution Workshop — 22nd July - 1st August 2012, MBL, Woods Hole MA, USA

Workshop participant on this competitive and internationally renowned course.

National Association for Research in Science Teaching — 25th-28th March 2012, Indianapolis, IN, USA

Oral presentation: "Working on the Public's Perception and Understanding of Science and Scientists through a Popular, Open-access 'AskScience' Website"
de la Rubia, L.A., Marus, S., Maguire, F.
(*Presented in absentia*).

Tennessee Maths and Science Education Research Conference — 2nd-3rd February 2012, Murfreesboro, TN, USA

Oral presentation: "Online Conversations as a Way of Understanding the Public's Views of the Nature of Science: Research on Reddit's 'AskScience' "
de la Rubia, L.A., Marus, S., Maguire, F.
(*Presented in absentia*)

Systematics Association: Young Systematists Forum — 1st December 2011, Natural History Museum

Poster presentation: "Folate Biosynthesis Gene Fusions Evolution in the Eukaryotes".

Society for General Microbiology Summer Conference — 5th-7th September 2011, University of York, UK

Poster presentation: "Evolution of Folate Biosynthesis Gene Fusions in the Eukaryotes".

EMBO: Comparative Genomics of Eukaryotic Microorganisms — 15th-20th October 2011, Sant Feliu de Guixols, Spain

Poster presentation: "Evolution of Folate Biosynthesis Gene Fusions in the Eukaryotes".

TEACHING AND SUPERVISION

- Wellcome Trust ISSF Genomics Course (February 4th-25th 2015)
- Wellcome Trust Biomedical Informatics Hub Unix and Perl Course (October 2014-July 2015)
- Co-supervision of final year undergraduate project at University of Exeter identifying components of the RNAi system in *Paramecium bursaria* (November-December 2014)
- Wellcome Trust Biomedical Informatics Hub Image Processing with Python Workshop (18th-19th September 2014)
- Software Carpentry Exeter Bootcamp (14th-15th November 2013)
- Supervision of a visiting summer research student registered at the University of Oxford. The project involved bioinformatic analysis of arsenate resistance HGTs. (June-October 2013)

OUTREACH

Moderator of the "AskScience" science education forum with over 15 million monthly views and 25,000 unique visitors per hour.

TECHNICAL SKILLS

- Experienced with UNIX/Linux, Zsh/Bash, Python, Awk, Git, LaTeX
- Familiarity with R, C, C++, perl, matlab, high-performance linux system administration, statistics and machine learning
- Rudimentary knowledge of Javascript, Nimrod, CSS, Verilog, Prolog, Go
- Expert knowledge in bioinformatics: transcriptomics, molecular evolution/phylogenetics, genomics, metabolomics, sequence analysis, annotation
- Experience with an array of basic molecular and microbiological techniques and methodologies: PCR, culturing, cloning, sequencing technologies, fluorescence microscopy.

OTHER INTERESTS

- Completed massively open online courses (MOOC) in: machine learning, mathematical logic, linear algebra, algorithms, databases, statistics, data analysis, and music theory.
- Technical co-founder of 'Awedify' a start-up seeking revolutionise the spoken-word audio format.
- PADI Open Water Diver
- St. John's Ambulance First Aider
- RYA Level 3 Sailing
- Languages: German (intermediate), French (basic/intermediate)
- Musical instruments: French Horn and Bass Guitar