Robert J. Noble

robjohnnoble.github.io
scholar.google.com/citations?user=lDDprHkAAAAJ

Research interests

Using mathematical and computational models to investigate the evolution and ecology of cancer.

Academic employment

2020-	Department of Mathematics, City, University of London Lecturer in Applied Mathematics
2018-2020	Department of Evolutionary Biology and Environmental Studies, University of Zurich Postdoctoral researcher (20% contract) advised by Hanna Kokko
2017-2020	Department of Biosystems Science and Engineering, ETH Zurich Postdoctoral researcher (80% contract from May 2018) advised by Niko Beerenwinkel
2014-2017	Institut des Sciences de l'Evolution de Montpellier (ISEM) Postdoctoral researcher advised by Michael Hochberg

Education

2009-2014	DPhil, Mathematical biology, University of Oxford Supervisors: Sunetra Gupta and Mario Recker
1999-2003	Master of Mathematics (First Class), University of York

Publications

* denotes equal contributions

In press	*Drug-induced resistance evolution necessitates less aggressive treatment* Kuosmanen T, Cairns J, **Noble R**, Beerenwinkel N, Mononen T, Mustonen V	PLoS Comput. Biol.
Accepted	*Spatial structure governs the mode of tumour evolution* **Noble R**, Burri D, Le Sueur C, Lemant J, Viossat Y, Kather JN, Beerenwinkel N	Nature Ecol. Evol.
2021	*Inferring the dynamic of mutated hematopoietic stem and progenitor cells induced by IFNα in myeloproliferative neoplasms* Mosca M*, Hermange G*, Tisserand A*, **Noble R***, …, Plo I	Blood blood.2021010986
2021	*Paracrine behaviors arbitrate parasite-like interactions between tumor subclones* **Noble R**, Walther V, Roumestand C, Hochberg ME, Hibner U, Lassus P	Front. Ecol. Evol. 9:675638
2021	*A theoretical analysis of tumour containment* Viossat Y, **Noble R**	Nature Ecol. Evol. 5, 826-35
2020	*Identifying key questions in the ecology and evolution of cancer* Dujon A, …, **Noble R**, …, Thomas F, Ujvari B	Evol. Appl. eva.13190
2020	*When, why and how clonal diversity predicts survival* **Noble R***, Burley JT*, Le Sueur C, Hochberg ME	Evol. Appl. eva.13057
2017	*Spatial competition constrains resistance to targeted cancer therapy* Bacevic K*, **Noble R***, Soffar A, Ammar OW, Boszonyik B, Prieto S, Vincent C, Hochberg ME, Krasinska L, Fisher D	Nature Commun. 8, 1995
2017	*Antibiotic stress selects against cooperation in the pathogenic bacterium* Pseudomonas aeruginosa Vasse M*, **Noble R***, Akhmetzhanov AR, Torres-Barceló C, Gurney J, Benateau S, Gougat-Barbera C, Kaltz O, Hochberg ME	PNAS 114, 546-51
2017	*A framework for how environment contributes to cancer risk* Hochberg ME, **Noble R**	Ecol. Lett. 20, 117-34

2016	*Overestimating the role of environment in cancers* **Noble R**, Kaltz O, Nunney L, Hochberg ME	Cancer Prev. Res. 9, 773-6
2015	*Peto's paradox and human cancers* **Noble R**, Kaltz O, Hochberg ME	Phil. Trans. B 370, 20150104
2013	*The antigenic switching network of* Plasmodium falciparum *and its implications for the immuno-epidemiology of malaria* **Noble R***, Christodoulou Z*, Pinches R, Kyes S, Recker M, Newbold CI	eLife 2013.2:e01074
2012	*Erasing the Epigenetic Memory and Beginning to Switch—The Onset of Antigenic Switching of* var *Genes in* Plasmodium falciparum Fastman Y, **Noble R**, Recker M, Dzikowski R	PLoS ONE 7, e34168
2012	*A statistically rigorous method for determining antigenic switching networks* **Noble R**, Recker M	PLoS ONE 7, e39335

Submitted for publication

Submitted	*Robust, Universal Tree Balance Indices* Lemant J, Le Sueur C, Manojlović V, **Noble RJ**	bioRxiv 10.1101/ 2021.08.25.457695

Software

2017	*ggmuller: Create Muller Plots of Evolutionary Dynamics*	CRAN
2019	*demon: Deme-based oncology model*	GitHub

Teaching

2020-	**Supervision (City, University of London)** PhD primary supervisor, Veselin Manojlovic PhD primary supervisor, Blair Colyer PhD secondary supervisor, Youssef Arafat PhD secondary supervisor, Hasan Haq **Lecturing and tutoring as module leader (City, University of London)** Mathematical processes for finance (BSc)
2017-2020	**Supervision (ETH Zurich)** Second year MSc thesis, Alexander Stein (next step: PhD at QMUL) Second year MSc thesis, Jeanne Lemant (next step: research scientist at Swiss TPH) Second year MSc thesis, Dominik Burri (next step: PhD at University of Basel) Research internship (eight months), Cécile Le Sueur (next step: PhD at EMBL) **Lecturing and tutoring assistance (ETH Zurich)** Evolutionary dynamics (MSc three terms)
2016	**Supervision (ISEM)** First year MEME MSc project, John Burley (next step: PhD at Brown University)
2010-2013	**Supervision (University of Oxford)** Second year BSc project, Charlotte Ward **Tutoring (University of Oxford)** Quantitative Methods (BSc two terms) **Demonstrating (University of Oxford)** Quantitative Methods (BSc; three terms); Epidemiology (BSc; two terms); Epidemiological Models (MSc one term)

Funding and awards

$150K personal funding for 2020-2023 from the NCI, via the Arizona Cancer Evolution Center

Co-awardee of Fondation Mathématique Jacques Hadamard grant *Optimization of a new type of cancer therapy* (€5K to support international collaboration in 2019-2020)

Biotechnology and Biological Sciences Research Council PhD fellowship 2009-2013

Travel grants: Lorentz Center 2017; Moffitt Cancer Center 2015; ECMTB 2011

City University Images of Research Competition 2020-21: First prize (£250)

Professional activities

Elected Advisory Committee member of the International Society for Evolution, Ecology and Cancer 2018-21

Guest Associate Editor: PLoS Computational Biology

Reviewer: American Naturalist, Cancer Research, Evolutionary Applications, F1000Research, Frontiers Ecology and Evolution, Journal of Theoretical Biology, Nature Communications, Nature Ecology & Evolution, Nature Genetics, npj Genomic Medicine, PLoS Computational Biology, PNAS, Proceedings of the Royal Society B, Royal Society Open Science, Scientific Reports

Co-organizer: "Cancer Adaptive Therapy Models" workshop (2020); "Aging & cancer through the lens of evolution" symposium (ESEB conference 2019); "How does spatial structure affect tumour evolution?" symposium (MBE conference 2017)

Other employment

2008-2009 International HIV/AIDS Alliance: Communications

2004-2008 AVERT (HIV/AIDS charity): Science/heath communication and web development

Invited departmental seminars

Sept 2020 *Characterizing and forecasting tumour evolution*
Cancer Research UK Cambridge Institute (virtual, hosted by Florian Markowetz)

Jun 2020 *Characterizing and forecasting tumour evolution*
Virtual Seminar on Modeling Biocomplexity (hosted by Andreas Deutsch)

May 2020 *Characterizing and forecasting tumour evolution*
Moffitt Cancer Center (virtual, hosted by David Basanta)

Jan 2020 *Cancer: evolution, ecology and bad luck*
University of Bath (hosted by Ben Ashby)

Dec 2019 *The logic of containing tumours*
University of Oxford (hosted by Eamonn Gaffney)

Sep 2019 *Cancer: evolution, ecology and bad luck*
University of Southampton (hosted by Lindy Holden-Dye)

Feb 2019 *Characterising the evolutionary modes of cancer and normal tissue*
TU Dresden (hosted by Andreas Deutsch)

Mar 2018 *Characterising the evolutionary modes of cancer and normal tissue*
University of Basel (hosted by Richard Neher)

Feb 2018 *The mode and predictability of intra-tumour evolution*
Wellcome Sanger Institute (hosted by Iñigo Martincorena)

Dec 2017 *The mode and predictability of intra-tumour evolution*
Boston University (hosted by Kirill Korolev)

Nov 2017 *Spatial constraints on intratumour evolution*
Harvard University (hosted by Martin Novak)

May 2017 *Models for understanding tumour evolution and improving cancer therapy*
University of Edinburgh (hosted by Bartlomiej Waclaw)

Mar 2017 *Evolution, ecology, and cancer risk: from naked mole rats to modern humans*
Chalmers University (hosted by Philip Gerlee)

Sep 2016 *Cancer: evolution, ecology and bad luck*
Harvard University (hosted by Martin Novak)

Feb 2015 *Data-based modelling of tumour evolution*
Moffitt Cancer Center (hosted by Robert Gatenby)

Conference talks

Jul 2021 *The evolutionary logic of tumour containment*
International Society for Evolution, Medicine & Public Health conference (virtual)

Jun 2021 *The evolutionary logic of tumour containment*
Evolution conference (virtual)

Jun 2021 *Explaining modes of tumour evolution*
Society for Mathematical Biology conference (virtual)

Dec 2020 *The logic of containing tumours*
Cancer Adaptive Therapy Models workshop (virtual)

Oct 2020 *Characterizing and forecasting tumour evolution*
International Symposium on Mathematical and Computational Oncology (virtual)

Aug 2020 *The logic of containing tumours*
Invited talk at the Society for Mathematical Biology conference (virtual)

Aug 2019 *Spatial competition constrains resistance to targeted cancer therapy*
International Society for Evolution, Medicine & Public Health conference, Zurich

Jul 2019 *Spatial structure governs the mode of tumour evolution*
Intelligent Systems for Molecular Biology / European Conference on Comp. Biology, Basel

Jun 2019 *Spatial structure governs the mode of tumour evolution*
Modelling Ecology & Evolution Zurich seminar, Zurich

Sep 2018 *Characterising the evolutionary modes of cancer and normal tissue*
Evolutionary Models of Structured Populations workshop, Plön

Dec 2017 *Spatial competition constrains resistance to targeted cancer therapy*
International Society for Evolution, Ecology and Cancer Conference, Tempe

Oct 2017 *Impact of tissue architecture on the nature and predictability of tumour evolution*
Satellite Symposium to the Louis-Jeantet Symposium, Geneva

Sep 2017 *Impact of tissue architecture on the nature and predictability of tumour evolution*
Basel Computational Biology Conference, Basel

Jul 2017 *Impact of tissue architecture on the nature and predictability of tumour evolution*
Intelligent Systems for Molecular Biology / European Conference on Comp. Biology, Prague

Apr 2017 *Evolutionary ecology of senescence and cancer risk: from naked mole rats to modern humans*
Modelling Biological Evolution conference, Leicester

Nov 2016 *Controlling drug resistance with adaptive therapy*
Invited talk at the second Modeling Tumour Evolution conference, Bielefeld

Sep 2016 *Cancer: evolution, ecology and bad luck*
Invited talk at the first Modelling Tumour Evolution conference, Bielefeld

Jul 2016 *Cancer risk: evolution, ecology and bad luck*
Joint Meeting of ESMTB & Society for Mathematical Biology, Nottingham

Dec 2015 *Peto's paradox and human cancers*
Third International Biannual Evolution and Cancer Conference, San Francisco

Sep 2015 *Modelling ecological interactions of cancer clones*
Cancer Evolution Through Space and Time workshop, Plön

Apr 2015 *Eco-evolutionary models of tumour heterogeneity*
Invited talk at the Modelling Biological Evolution conference, Leicester

June 2011 *Using iterative methods to determine an antigenic switching network in* Plasmodium falciparum
European Conference on Mathematical and Theoretical Biology, Krakow

May 2011 *Determining the switch pathway of the* var *gene repertoire of* Plasmodium falciparum
Biology and Pathology of the Malaria Parasite, Heidelberg