University of Birmingham

Professor Robin May MA(Oxon), PhD

Lister Fellow & Professor of Infectious Disease

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About

I am Professor of Infectious Disease and Lister Fellow in the School of Biosciences. My research centres on human infectious diseases, with a particular focus on the molecular basis of host-pathogen interactions.

Qualifications

- MA(Oxon), Biological Sciences
- PhD (Birmingham), Cell Biology

Biography

My PhD research, on the regulation of the actin cytoskeleton, was undertaken at the Laboratory for Molecular Cell Biology, UCL, and here at the University of Birmingham, with Professor Laura Machesky (now at the Beatson Institute, Glasgow).

In 2001 I was awarded a Human Frontier Science Program (HFSP) fellowship and moved to the Netherlands to work with Professor Ronald Plasterk (now a member of the Dutch Parliament) on the mechanism of RNA interference in *C. elegans*.

In 2005 I was awarded an RCUK Fellowship to return to Birmingham as an independent Principal Investigator. I am now Professor in Infectious Disease and, in 2010, was appointed as a Lister Prize Research Fellow.

Teaching

I teach eukaryotic microbiology on the first year “Microbiology and Infectious Disease” course (BIO153) and aspects of host-pathogen interactions on the final year “Molecular and Cellular Immunology” (BIO388), “Adaptation to Changing Environments” (BIO389) and "Human Evolution" (BIO380) courses. I am also a tutor for undergraduate Human Biologists.

Postgraduate supervision

We are always interested in hearing from potential PhD students who may wish to join the lab. We typically take on one PhD student each year to join their project of choice. You can find out more about current graduate students in the group here: **www.biosciences-labs.bham.ac.uk/may/People.html (http://www.biosciences-labs.bham.ac.uk/may/People.html)**

For a list of possible PhD projects offered by Professor May, see: **www.findaphd.com/search/customlink.asp?inst=birm-Biol&supersurname=May (http://www.findaphd.com/search/customlink.asp?inst=birm-Biol&supersurname=May)**

Doctoral research

PhD title Regulation of the actin cytoskeleton.

Research

Research Theme within School of Biosciences: Molecular Microbiology

Lab website address: www.biosciences-labs.bham.ac.uk/may/ (http://www.biosciences-labs.bham.ac.uk/may/)

Short research description

My research focuses on the molecular basis of host-pathogen interactions. My group combine high-resolution microscopy with molecular and genetic approaches to probe the events that underlie establishment and spread of infective agents; primarily the fungus *Cryptococcus neoformans*, but also the invasive zygomycete fungi and the bacterial pathogens *Salmonella* Typhimurium (a leading cause of food-poisoning) and *Streptococcus agalactiae* (the leading cause of neonatal meningitis in the developed world).

Full research description

The evolution and molecular basis of host-pathogen interactions

The continual struggle between pathogens and their hosts is a major selective force, resulting in the evolution of ever more complex host-pathogen interactions as both

sides attempt to 'win' the conflict. We are interested in the molecular basis of such interactions and in how they have evolved.

To address these questions we combine cellular and whole-organism based approaches to study the interaction between cells of the mammalian immune system (primarily macrophages) and several pathogens. We are particularly interested in understanding how some organisms can survive, replicate and eventually escape from within macrophages.

For more information on our research and the members of our group, please see our lab **website (http://www.biosciences.bham.ac.uk/labs/may/)** .

Listen to my podcast 'Infection' (MP3 - 16.5MB) (/Audio/news/robin-may-infection.mp3) .

Publications

For a full list of recent publications please visit **PubMed.gov (http://www.ncbi.nlm.nih.gov/pubmed?term=May%20RC)**

Selected publications

Head MG, Fitchett JR, Atun R, **May RC.** Systematic analysis of funding awarded for mycology research to institutions in the United Kingdom, 1997-2010. *BMJ Open*, 2014 4: e004129

Voelz K, Ma H, Byrnes EJ, Phadke S, Zhu P, Farrer RA, Henk DA, Lewit Y, Hsueh Y-P, Fisher MC, Idnurm A, Heitman J, **May RC**. Transmission of hypervirulence traits via sexual reproduction within and between lineages of the human fungal pathogen *Cryptococcus gattii. PLOS Genetics*, 2013 9(9): e1003771.

Lim J, Thompson J, **May RC**, Hotchin NA, Caron E. Regulator of G-protein Signalling-14 (RGS14) regulates the activation of aMb2 integrin during phagocytosis. *PLOS ONE*. 2013, 8(6): e69163.

Smith LM, **May RC**. Mechanisms of microbial escape from phagocyte killing. *Biochem Soc* Trans. 2013, 41(2):475-90

Browning DF, Wells TJ, Franca FLS, Johnson MD, Morris FC, Bryant JA, Lund PA, Hobman JL, **May RC**, Webber MA, Henderson IR. Restoration of O antigen biosynthesis radically alters the ability of *Escherichia coli* K-12 to survive lethal environmental stresses. *Mol Micro*. 2013, 87(5): 939-50

Johnston SA & **May RC**. *Cryptococcus* Interactions with Macrophages: Evasion and Manipulation of the Phagosome by a Fungal Pathogen. *Cell. Micro*, 2013, 15(3): 403-11

Sabiiti W, **May RC**. Mechanisms of infection by the human fungal pathogen *Cryptococcus neoformans*. *Future Microbiology* 2012, 7(11):1297-1313.

Cumley NJ, Smith LM, Anthony M, **May RC**. The CovS/CovR Acid Response regulator is required for intracellular survival of Group B *Streptococcus* in macrophages. *Infect. Immun*. 2012, 80(5):1650.

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Marsh EK & **May RC**. *Caenorhabditis elegans*: a model organism for investigating immunity. *Appl. Env. Micro*. 2012, 78(7):2075.

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Raghunathan D, Wells TJ, Morris FC, Shaw RK, Bobat S, Peters SE, Paterson G, Tveen Jensen K, Leyton DL, Blair J, Browning DF, Pravin J, Flores-Langarica A, Hitchcock JR, Moraes C, Piazza RM, Maskell DJ, Webber M, **May RC**, MacLennan C, Piddock LJ, Cunningham AF, Henderson IR. SadA, a trimeric autotransporter from *Salmonella enterica* Typhimurium, can promote biofilm formation and provides limited protection against infection. *Infect. Immun*, 2011. 79(11):4342-52.

Byrnes EJ III, Li W, Ren P, Lewit Y, Voelz K, Fraser JA, Dietrich FS, Carter DA, **May RC**, Chaturvedi S, Chaturvedi V, Heitman J. A diverse population of *Cryptococcus gattii* molecular type VGIII in Southern Californian HIV/AIDS patients. *PLoS Pathogens*, 2011. 7(9): e1002205

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Carnell M, Zech T, Calaminus S, Seiji U, Hagedorn M, Johnston SA, **May RC**, Soldati T, Machesky LM, Insall RH. Actin polymerization driven by WASH causes vesicle neutralization and V-ATPase recycling before exocytosis. *J Cell Biol*, 2011. 193(5):831-9.

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Amrit FR & **May RC**. Younger for longer: insulin signalling, immunity and ageing. *Current Aging Science*, 2010. 3(3):166.

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Ma H, **May RC.** Mitochondria and the regulation of hypervirulence in the fatal fungal outbreak on Vancouver Island. *Virulence*, 2010. 1(3): 197-201

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Ma H, Croudace JE, Lammas DA, **May RC**. Expulsion of live pathogenic yeast by macrophages. *Curr Biol*. 2006 Nov 7;16(21):2156-60.

van den Berg MC, Woerlee JZ, Ma H, **May RC**. Sex-dependent resistance to the pathogenic fungus *Cryptococcus neoformans*. *Genetics*. 2006 Jun;173(2):677-83.

Expertise

How pathogens infect their hosts and how hosts retaliate; the interaction between human immune cells and a fatal fungal pathogen; the evolution of immunity which we study using a species of microscopic worm.

Alternative contact number available for this expert: **contact the press office (http://www.birmingham.ac.uk/news/contacts/index.aspx)**

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