

Dr Jorge Caamaño PhD

Senior Lecturer

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About

Jorge Caamaño is Senior Lecturer in Immunology at the School of Immunity and Infection.

Jorge has published more than 50 papers in scientific journals, as well as book chapters and reviews in gene expression and signal transduction. He has received major funding from MRC, BBSRC, and the European Union.

Qualifications

- PhD Biochemistry 1994
- MSc (Hons) Biochemistry 1986

Biography

Jorge received his MSc in Biochemistry from the University of Buenos Aires, Argentina in 1986. He moved to Philadelphia, PA, USA in 1988 to do his PhD thesis studies on the function of tumour suppressor genes in a joint project between the Fox Chase Cancer Center and the School of Biochemistry, Univ. of Buenos Aires, Argentina.

Jorge was awarded a PhD in Biochemistry in 1994.

He went on to do postdoctoral work on the field of signalling and gene expression in the immune system at the Bristol-Myers Squibb Pharmaceutical Research Institute in Princeton, NJ, USA. He developed a keen interest in understanding the in vivo function of a family of transcription factors called Nuclear Factor Kappa B (NF- κ B).

From there he moved to continue his work in regulation of gene expression during immune responses to infections at the School of Veterinary Medicine at the University of Pennsylvania, Philadelphia, USA.

Jorge joined the School of Immunity and Infection in 2000

He referees manuscripts for several journals such as Journal of Experimental Medicine, Journal of Immunology, European Journal of Immunology, International Immunology, Molecular and Cellular Biology, and Oncogene.

He reviews grant proposals for several research councils and charities in UK and abroad such as the BBSRC, MRC, Wellcome Trust, Yorkshire Cancer Foundation, Association for International Cancer Research AICR, Agence Nationale de la Recherche (France), Fundação para a Ciência e a Tecnologia (Portugal), Health Research Board (Ireland), Fonds de la Recherche Scientifique (Belgium), and Netherlands Organization for Scientific Research (NWO).

He has been external examiner of PhD thesis for University of London, Univ. of Paris VII (France), etc.

Jorge has organized the Microanatomy of Immune Responses in Health and Disease Conference together with Peter Lane and Graham Anderson. He is currently organizing the 17th Germinal Centre Conference together with Kai Toellner.

He is a member of the advisory board of Unit of Molecular Immunology and Signal Transduction, GIGA-Research at the University of Liege, Belgium.

Teaching

Teaching Programmes

- **BMedSci** ([/undergraduate/courses/med/medical-sci.aspx](#)) Course 2 Yr Immunology Module
- **MBCChB** ([/undergraduate/courses/med/medicine.aspx](#)) Course 2 Yr Immunology Module
- Intercalated **BMedSci** ([/undergraduate/courses/med/medical-sci.aspx](#)) Immunology Module
- MRes Cellular and Molecular Medicine module in Immunology in Health & Disease
- Physical Sciences of Imaging in the Biomedical Sciences (PSIBS) Doctoral Course
- PhD Supervisor.

Postgraduate supervision

Jorge supervises doctoral research students in the following areas:

- Signalling pathways involved in the development of secondary lymphoid organs and inflammation.
- Induction of gene expression by members of the Tumour Necrosis Factor Receptor family (TNF-R) and the NF- κ B transcription factors during immune responses and disease.
- The role of the NF- κ B transcription factors during cell transformation.

In the last few years three PhD students have successfully completed a PhD under his supervision. They have moved on to pursue careers in academia and in the pharmaceutical industry.

If you are interesting in studying any of these subject areas please contact Jorge on the contact details above, or for any general doctoral research enquiries, please email: dr@contacts.bham.ac.uk (<mailto:dr@contacts.bham.ac.uk>) or call +44 (0)121 414 5005.

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Research

RESEARCH THEMES

Gene Expression in the Immune System
 Inflammation
 Lymphostromal Interactions in the Immune System
 Lymphoid Tissue Organogenesis

RESEARCH ACTIVITY

The role of the Nuclear Factor-kappa B transcription factors during inflammation.

Recruitment of immune cells to inflammatory sites and subsequent priming of the stromal cells predisposes the patients to chronic inflammation and in some cases tumour formation. This scenario is true in patients with inflammatory bowel disease, rheumatoid arthritis and other autoimmune diseases. The involvement of the stromal cells and their subsequent support to the survival and accumulation of immune cells and tumour growth have not been fully elucidated. One of the factors that appear to have an important role in both immune cells and stromal cells is the Nuclear Factor-kappa B (NF- κ B) family of proteins. These proteins participate in the expression of inflammatory cytokines, chemokines and cell adhesion molecules that facilitate immune cell recruitment to inflammation sites. In addition these proteins control the expression of anti-apoptotic genes and thus they have been found activated in a large number of tumours and cell lines derived from them. Blocking NF- κ B in tumour cell lines induces programmed cell death underlying the essential role of these transcription factors.

The NF- κ B proteins are highly conserved in evolution from Drosophila to mammals. Mammalian cells contain five different NF- κ B proteins. These transcription factors remain inactive in the cytoplasm of cells and upon stimulation they become activated, migrate to the cell nuclei and contribute to gene expression. Many different receptors activate NF- κ B by at least two general mechanisms, the classical/canonical and the alternative/non canonical NF- κ B activation pathway. Research in Jorge's group has been focussed in understanding the function of the proteins of the alternative NF- κ B pathway in vivo during development, immune responses and inflammation. His group has shown that NF- κ B2-mediated gene expression is required for the expression of chemokines and cell adhesion molecules as well as for maturation of follicular dendritic cells and B cells. Recent work is dissecting the function and target genes of the alternative NF- κ B pathway in chronic inflammation.

Development of Secondary Lymphoid Tissues.

The immune system is composed of many different cell types with specific functions. These cell types interact with each other in a concerted manner during immune responses to pathogens. Such interactions take place in specific microenvironments that are present in secondary lymphoid tissues such as the spleen and lymph nodes that are distributed around the body. Absence or disruption of these microenvironments results in impaired immune responses and decrease host survival

Jorge's group have been focussed on dissecting the crosstalk interactions between bone marrow derived cells and stromal cells using lymph node formation as a model. They have developed in vitro and in vivo model systems to study these cellular interactions and the function of the ligands and receptors of the Tumour Necrosis factor (TNF) family of proteins such as Lymphotoxin alfa-Lymphotoxin Beta Receptor pathway and the NF- κ B proteins. Importantly, the same molecules that mediate the cell-cell interactions during lymph node development are also involved in chronic inflammatory diseases in humans such as rheumatoid arthritis and inflammatory bowel disease and cancer.

This work is carried out in close collaborations with the groups of Graham Anderson and Peter Lane.

Other activities

Member of the advisory board of Unit of Molecular Immunology and Signal Transduction, GIGA-Research at the University of Liege, Belgium

Publications

Coy S, Caamaño JH, Carvajal J, Cleary ML, Borycki AG. (2011), A Novel Gli3 Enhancer Controls the Gli3 Spatiotemporal Expression Pattern through a TALE Homeodomain Protein Binding Site. *Mol Cell Biol.* 31: 1432-1443.

White AJ, Nakamura K, Jenkinson WE, Saini M, Sinclair C, Seddon B, Narendran P, Pfeffer K, Nitta T, Takahama Y, Caamano JH, Lane PJ, Jenkinson EJ, Anderson G. (2010), Lymphotoxin signals from positively selected thymocytes regulate the terminal differentiation of medullary thymic epithelial cells. *J Immunol.* 185: 4769-4776.

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Arranz L, Caamaño J, Lord JM, De la Fuente M. (2010) Preserved immune functions and controlled leukocyte oxidative stress in naturally long-lived mice: Possible role of nuclear factor-kappaB. *J Gerontol A Biol Sci Med Sci.* 65:941-950

White A, Carragher D, Parnell S, Msaki A, Perkins N, Lane P, Jenkinson E, Anderson G, Caamaño J. (2007), Lymphotoxin-alpha-Dependent and -Independent Signals Regulate Stromal Organiser Cell Homeostasis During Lymph Node Organogenesis. *Blood* 110:1950-1959.

Withers D, Kim M, Bekiaris V, Rossi S, Jenkinson W, Gaspal F, McConnell F, Caamaño J, Anderson G, Lane P. (2007), The role of lymphoid tissue inducer cells in splenic white pulp development. *Eur J Immunol* 37:3240-3245.

Schumm K, Rocha S, Caamaño, J, Perkins N. (2006), Regulation of p53 tumor suppressor target gene expression by the p52 NF- κ B subunit.

Carragher D, Johal R, Button A, White A, Eliopoulos A, Jenkinson E, Anderson G, and Caamaño J. (2004), A stroma-derived defect in nuclear factor kappa b2-/- mice causes impaired lymph node development and lymphocyte recruitment. J Immunol 173: 2271-2279.

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