

Dr Padma Sheela Jayaraman PhD

Senior Research Fellow

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About

Sheela Jayaraman is a Senior Stem Cell Research Fellow.

Sheela specialises in understanding the structure and function of the PRH/HHex transcription factor and its roles in growth, development and differentiation. Sheela has published reviews and many papers in this area. She has received major grants from the BBSRC, Wellcome Trust, Breast Cancer Campaign.

Qualifications

- PhD Biochemistry
- BSc (Hons) Medical Biochemistry

Biography

Sheela qualified with a Ph.D Biochemistry from the University of Birmingham in 1989. She then worked in London both at the Marie Curie Res Institute, and the Institute Cancer Research. She was a MRC Research Fellow at Bristol University and then moved to Birmingham in 2006 to continue her work on the role of gene regulation by PRH in leukaemia and in other cancers.

Teaching

Teaching Programmes

- [BMedSci \(/undergraduate/courses/med/medical-sci.aspx\)](#) tutorials and projects

Postgraduate supervision

Sheela is interested in supervising doctoral research students in gene regulation/chromatin organisation in several disease states: including

- Breast cancer.
- Leukaemia
- Vascular disease

If you are interesting in studying any of these subject areas please contact Sheela on the contact details above, or for any general doctoral research enquiries, please email: [dr@contacts.bham.ac.uk \(mailto:dr@contacts.bham.ac.uk\)](mailto:dr@contacts.bham.ac.uk)

For a full list of available Doctoral Research opportunities, please visit our [Doctoral Research programme listings \(http://www.bham.findaphd.com/?es=y&apl=y&apl=&show\)](http://www.bham.findaphd.com/?es=y&apl=y&apl=&show).

Research

RESEARCH THEMES

Gene Regulation, Chromatin organisation, Cancer Cell Biology, Stem cell differentiation

RESEARCH ACTIVITY

PRH

The main emphasis of the work has been on the role of PRH in the growth and differentiation of haematopoietic cells. To pursue this Sheela has published a number of papers on the biophysical characterisation of the PRH protein and the mechanisms that PRH uses to regulate genes. She also investigates the post-translational regulation of the PRH protein and has shown that phosphorylation of PRH can control cell growth. Her current data shows that PRH is involved in the regulation of important growth control pathways. She investigates how PRH regulates the growth of leukaemic cells, breast tumour cells, vascular cells and stem cells.

Publications

Noy P, Williams H, Sawasdechai A, Gaston K, Jayaraman PS (2010), PRH/HHex controls cell survival through coordinate transcriptional regulation of vascular endothelial growth factor signaling. Mol Cell Biol. 30(9):2120-34.

Oram SH, Thoms JA, Pridans C, Janes ME, Kinston SJ, Anand S, Landry JR, Lock RB, Jayaraman PS, Huntly BJ, Pimanda JE, Göttgens B. (2010). A previously unrecognized promoter of LMO2 forms part of a transcriptional regulatory circuit mediating LMO2 expression in a subset of T-acute lymphoblastic leukaemia patients. *Oncogene*. 29:5796-808

Soufi A, Sawasdichai A, Shukla A, Noy P, Dafforn T, Smith C, Jayaraman PS, Gaston K. (2010). DNA compaction by the higher-order assembly of PRH/Hex homeodomain protein oligomers. *Nucleic Acids Res.* 38(21):7513-25

Soufi A., Noy P., Buckle M., Sawasdichai A., Gaston K and Jayaraman P-S (2009) CK2 phosphorylation of the PRH/Hex homeodomain functions as a reversible switch for DNA binding. *Nucleic Acids Research* 37 (10):3288-300

Desjobert C, Noy P, Swingler T, Williams H, Gaston K, Jayaraman PS. (2009) The PRH/Hex repressor protein causes nuclear retention of Groucho/TLE co-repressors. *Biochem J.* 417(1):121-32.

Williams H, Jayaraman PS, Gaston K. (2008) DNA wrapping and distortion by an oligomeric homeodomain protein. *J Mol Biol.* 383(1):10-23.

Soufi A, Jayaraman PS. (2008) PRH/Hex: an oligomeric transcription factor and multifunctional regulator of cell fate. *Biochem J.* 412(3):399-413

Jankovic D, Gorello P, Liu T, Ehret S, La Starza R, Desjobert C, Baty F, Brutsche M, Jayaraman PS, Santoro A, Mecucci C, Schwaller J. (2008) Leukemogenic mechanisms and targets of a NUP98/HHEX fusion in acute myeloid leukemia. *Blood.* 111(12):5672-82.

Soufi A, Smith C, Clarke AR, Gaston K, Jayaraman PS. (2006) Oligomerisation of the developmental regulator proline rich homeodomain (PRH/Hex) is mediated by a novel proline-rich dimerisation domain. *J Mol Biol.* 358:943-62

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