

Computational research aims to alleviate embarrassing bladder problems

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Scientists from the University of Birmingham and the Indian Institute of Technology (IIT), Bombay are working together to develop new ways of treating bladder overactivity, a problem which affects millions of people worldwide.

The joint research focuses on understanding the electrical activity in the bladder and how this goes wrong and causes urinary incontinence.

Bladder overactivity is a common condition that increases in prevalence with age and often arises in people with diabetes, Parkinson's disease, urinary tract infections and following spinal cord injury. Existing treatments are very poor, mainly due to side effects which limit their use. To that end, there is a pressing need for research such as this to develop better therapies, particularly as populations continue to age.

The researchers will use computational tools, developed by Professor Rohit Manchanda from IIT Bombay, to analyse the bladder. The tools provide insight into how cells regulate their electrical behaviour and have been widely used to understand the electrical activity of the brain. However, this will be the first time they have been applied to the bladder.

Dr Keith Brain, Senior Lecturer in Neuropharmacology, at the University of Birmingham, said:

"Bladder overactivity is no fun, whether you're in the India or the UK. People in both countries are living longer, and with that comes ever more urinary incontinence; we need to be able to better treat this neglected and embarrassing problem.

"Our group is really keen to apply the cutting-edge computational techniques developed in India to help us understand and then better treat bladder problems. The existing drugs just don't work well enough to allow people to live normal lives."

As part of the project, Engineering and Computer Science PhD students will come to Birmingham from India to conduct research. The students will carry out experiments with biological tissues recording the electrical behaviour of bladders and then apply the analytical and computational tools to address key questions such as why bladders become overactive with age and diseases such as diabetes.

The researchers will then develop new ways of treating bladder dysfunction, using an iterative approach where new computational discoveries feed back into laboratory experiments. The results will be used in redesigning the computational models as the researchers gain a greater understanding. In turn, the students will return to India with valuable experience in applied electrophysiology and pharmacology.

The research project is funded by the UK-India Education and Research Initiative (UKIERI) as part of the Innovation Partnerships strand. This initiative aims to provide opportunities for UK and Indian universities and institutions to collaborate on thematic partnerships to enhance the innovation capacity of both India and the UK. It promotes partnerships between higher education institutions which focus on innovation and new areas of development in research, in areas relevant to both countries.

Notes to Editors

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