

JOB DESCRIPTION

Post-doctoral Research Associate in Nonlinear and Biomedical Physics
Conduction and selectivity between monovalent ions within the potassium channel
Vacancy Ref: A2017

Job Title: Senior Research Associate in Ion Channel Physics (theory)	Present Grade: 7
Department/College: Physics	
Directly responsible to: Peter McClintock, PI of the Leverhulme project	
Supervisory responsibility for: Possibly some help with supervision of PG & UG students	
Other contacts Internal: Members of the Nonlinear and Biomedical Physics Group, including Co-Investigators Dmitri Luchinsky and Aneta Stefanovska, PDRAs including Igor Kaufman, and PhD students; and our collaborators in Biomedical and Life Sciences Stephen Roberts and Olena Fedorenko. External: Our external collaborators, e.g. Igor Khovanov and his research group (Warwick) and Bob Eisenberg and his research group (Chicago).	
Major Duties: To develop a detailed understanding of conduction and selectivity in narrow biological ion channels, based on a statistical physics approach. In particular, the post holder will be expected to:- 1. Take responsibility for-day-to day project management. 2. Use statistical physics and linear response to develop a first-principles analytic theory of conduction in narrow ion channels accounting for discrete energy states and non-identical binding sites. 3. Develop Chapman-Kolmogorov and Maxwell-Stefan kinetic models of multicomponent conduction and diffusion in narrow channels based on the results of statistical theory, experiment, and MD analysis. 4. Apply the theory to the potassium KcsA and NaChBac channels. 5. Liaise closely with the other PDRA on the project in relation to numerical work, including amendment of models and codes in the light of comparisons with experimental data in the database constructed by her/him. 6. Predict outcomes/properties of new mutant channels that may be created by our biological collaborators. 7. Draft scientific papers arising from the project. 8. Participate in national and international conferences, presenting the results of the project and learning about current advances in the field. 9. Generally help with the running of the research group, including: supervision of new/junior members of the group, UG/PG students, and visiting students; and participation in outreach for schools, visitors and the public; and such other activities as may be directed by the PI.	