



## MRC-DiMeM PhD position

### Understanding asymmetric cell divisions at the onset of life

**Application deadline:** 21st January 2019; **Start of PhD:** 1st October 2019 (3.5 years)

To generate a complex organism from a single-cell embryo, cells divide asymmetrically acquiring structural and functional differences. This polarisation of cells is essential for tissue and organ development and depends on the localisation of conserved effectors, notably PAR proteins, to discrete cell membrane domains. A wide-range of developmental problems are associated with impaired PAR function (e.g. cardiovascular, neurodegenerative diseases and cancer). Consequently, understanding how PARs act is of great biological importance (J. Cell Sci. 2017 vol. 130(7): 1201-1207).

Recently, we have shown that the activity of the PAR-signalling component, aPKC-kinase, is not only critical to signal the polarisation programme but also creates the asymmetric domain of active PARs needed for the development of the early embryo (Nat. Cell. Biol. 2013 vol. 15(1): 103-112; Dev. Cell 2017 vol. 42(4): 400-415). We are seeking an enthusiastic and highly motivated student keen to reveal the molecular mechanisms underlying this novel aPKC function. We will use a multi-disciplinary approach, including genetic screens, proteomics, biochemical assays, genome editing, mathematical modelling and cutting-edge microscopy analyses (super-resolution). Studies will be performed in nematode *C. elegans* and mammalian model systems (cell culture and mice).

The student will scientifically grow in a great research environment. Our lab (<https://www.staff.ncl.ac.uk/josana.rodriguez/>) enjoys state of the art equipment and is situated in the supportive and ambitious research Institute for Cell and Molecular Biosciences (<https://www.ncl.ac.uk/camb/>), within the Medical School at Newcastle University (Newcastle upon Tyne, UK). We are part of a vibrant scientific community studying cell division from different angles (<https://research.ncl.ac.uk/celldivisionbiology/>).

#### Relevant papers

- Campanale JP *et al.* Development and dynamics of cell polarity at a glance. J. Cell Sci., 2017 vol. 130 (7): 1201-1207.
- Rodriguez J *et al.* aPKC Cycles between Functionally Distinct PAR Protein Assemblies to Drive Cell Polarity. Dev. Cell, 2017 vol 42 (4): 400-415.
- Fievet B *et al.* Systematic genetic interaction screens uncover cell polarity regulators and functional redundancy. Nat Cell Biol, 2013 vol. 15 (1): 103-112.

**Requirements.** Candidates should have or expect to achieve a First Class or 2:1 Honours degree in a relevant science subject (having an MRes or MSci would be considered an advantage). Students interested in developmental biology, molecular biology, cell polarity and in microscopy techniques are encouraged to apply.

**Informal enquiries** should be directed to Dr Josana Rodriguez ([josana.rodriguez@ncl.ac.uk](mailto:josana.rodriguez@ncl.ac.uk)). It would be great if you could provide: 1) cover letter expressing your interest to join us and to develop the proposed research project, 2) full CV and 3) two reference letters including referee contact details.

**To apply** please follow this link: <https://www.findaphd.com/search/ProjectDetails.aspx?PJID=103820>