

A full-time European Research Council (ERC)-funded post-doctoral position for a young and enthusiastic scientist is available in the Pluchino laboratory at the Cambridge Centre for Brain Repair, and Cambridge Stem Cell Initiative, University of Cambridge, UK.

This post is to work on a collaboration frame between the University of Cambridge, UK and the University of Cincinnati, USA aiming at the exploitation of RNA nanotechnologies for the treatment of inflammatory neurological diseases.

Research will be co-directed by Stefano Pluchino, MD, PhD and Peixuan Guo, PhD and major focus will be the development of innovative RNA nanostructures to target neural and non-neural cells in vitro, and in vivo in animal models of multiple sclerosis and spinal cord injury.

Research in the Pluchino laboratory is exploring the cellular and molecular mechanisms regulating the therapeutic plasticity of NPCs in complex CNS diseases such as multiple sclerosis, and spinal cord injury. Besides some classical experimental cell therapy approaches with pluripotent stem cell-derived precursors/progenitors, we are devoting special attention to the different modalities by which NPCs engage programs of horizontal cell-to-cell communication with cells in the microenvironment. Our most recent work suggests that a key role in this might be attributed to a novel mechanism of intercellular communication through the transfer of secreted membrane vesicles (MVs; shown to contain RNAs) from donor to recipient cells. Recent years have seen many important regulatory functions ascribed to non-coding RNAs (ncRNAs), making direct and indirect consequences of ncRNA-directed transcriptional regulation significant. With the advent of next generation deep sequencing (DS) technologies, obtaining a comprehensive description of NPCs and MV transcriptome is now quite common place. Nevertheless, this convergence of DS technology and the potential regulatory roles of ncRNAs in NPCs would provide many opportunities as well as challenges in terms of data mining methodology in uncovering biological significance, identifying ncRNA targets as well as deciphering the exact mechanism of translational repression of messenger RNAs (mRNAs) by these ncRNAs. To this end, we aim developing a number of innovative in vitro and in vivo approaches to look into an innate (physiological) mechanism with the visionary focus of translating the knowledge of basal (vs reactive) stem cell functions into innovative highly clinical impact therapeutics.

After discovering the phi29 motor RNA (pRNA) (*Science* 236: 690-694, 1987), Dr. Guo proved the concept of RNA nanotechnology in 1998 by showing that RNA nanoparticles can be assembled from individual reengineered RNA molecules (*Mol. Cell* 2: 149-155, 1998). He formally brought to the general public about the concept of RNA Nanotechnology in 2004 (*Nano Letters* 4: 1717-1724, 2004). His lab showed that in conjunction with aptamer, siRNA, and ribozyme, RNA technology can lead to the development of novel therapeutics for the treatment of cancer, viral infection, and genetic diseases (*Nature Nanotech* 5: 833-842, 2010).

Candidates with strong background RNA chemistry, nucleotide chemistry, cell and stem cell biology, and holding a PhD, or equivalent degree, are encouraged to apply. Prior experience with stem cells and/or neural cells is desirable, though not mandatory.

The successful candidate should be highly motivated, display initiative and independence, and have good track record of publications and verbal and written English communication skills.

The University of Cambridge (UCAM) is one of the world's oldest universities and leading academic centres, comprised of 31 Colleges and over 150 Departments, Faculties, Schools and other Institutions. The Cambridge Centre for Brain Repair (CCBR), is a Division of the University Department of Clinical Neurosciences in the School of Clinical Medicine. The CCBR is based on the site of the University's Clinical Sciences Campus and provides a unique environment for both basic and clinical research, as well as stem cell and translational medicine in a multi disciplinary research environment with strong collaborative links. Stem cell research is being pursued in multidisciplinary collaborations between researchers across the UCAM, including those located in the Laboratory for Regenerative Medicine (LRM), the Wellcome Trust Centre for Stem Cell Research, the Wellcome Trust Gurdon Institute, the Cambridge Institute for Medical Research, the Cancer Research UK Cambridge Research Institute, the Department of Veterinary Medicine, as well as in several other departments within the School of the Biological Sciences and the School of Clinical Medicine. These collaborations are fostered by the Cambridge Stem Cell Initiative (CSCI), which brings together leading investigators with interests in stem cells and affiliated disciplines from across the entire UCAM. The CSCI is the primary conduit for engagement between basic and clinical scientists aimed at biomedical translation of stem cell and regenerative medicine research. The CSCI mission is to generate insights into the biology of stem cells through basic research, thus providing the foundation needed for novel therapies from regenerative medicine and offers stem cell researchers the potential for wide interdisciplinary collaborations in areas such as proteomics, genomics, bioinformatics, chromatin structure and gene regulation.

Applicants should send an email containing a statement of interest, a CV and the names of three referees to either Stefano Pluchino <spp24@cam.ac.uk>, or Peixuan Guo <guop@purdue.edu>.

Further particulars of the role can be obtained by contacting Shannon Tinley on skt37@cam.ac.uk.