General description: The Regenerative Medicine Institute (REMEDI) is a biomedical research centre with a central focus on the development of novel therapies for human diseases using adult stem cell and/or gene therapies. REMEDI was established at NUI, Galway in 2004 as a Science Foundation Ireland-funded Centre for Science, Engineering and Technology.

Website: www.remedi.ie , www.nuigalway.ie

Expertise: Adult stem cell technology, gene therapy, animal models of cartilage repair and osteoarthritis, immunology of adult stem cells. Senior technicians (cell culture, viral production, histology, microarray etc), lab manager.

Facilities: Fully equipped/licensed animal facility; fully equipped molecular biology, immunology, cell culture and viral production (BSL2) labs: FACS facility; GMP Facility, fully funded Clinical Research Facility; outreach core.

Other European projects: PURSTEM (223298), ADIPOA (241719), EUROSTEMCELL (241878)

Role in the project: NUIG will lead WP04 to develop spatiotemporal, controlled immune modulation in the injured joint by developing protocols for inducible cytokine release in response to inflammation post-injury. In addition they will contribute cDNAs, promoter sequences and adenoviral vector constructs for use in WP1. This WP will also involve a specific contribution to the generation of gutless adenoviral vectors for inducible promoters and cDNAs. The outreach core at NUIG will work with SCID in WP08 to develop 2-way

communication links with the Irish public in general and specific local patient organisations for dissemination of risks and ethical aspects of the GAMBA novel therapeutic strategy. Finally, NUIG will contribute expertise to WP 5-7 when required.

Workpackages responsibilty: Reduction of inflammation in vitro and in vivo
WP01 , WP02 , WP03 , **WP04** , WP07 , WP08 (bold = WP leader; WP = Workpackage)

Key personnel

Mary Murphy : PhD, has 14 years' experience in stem cell research specialising in therapies for cartilage repair and osteoarthritis with specific experience in translating this research to initiation of the first clinical trial in the area. She is a PI at REMEDI and Lecturer in Regenerative Medicine.

Timothy O’Brien : Prof. Dr., is a world leader in gene therapy research and Director of REMEDI. He is currently Chairman of the Dept. of Medicine at the National University of Ireland, Galway He has published over 130 articles and was PI on a phase 2/3 human gene therapy trial.

Frank Barry : PhD, REMEDI Scientific Director and Prof. of Cellular Therapy is a leader in bone marrow stem cell biology and culture with a focus on orthopaedic and cardiovascular applications. He has 15 years experience in the field with seminal publications and directed work which led in the first clinical trial worldwide in the area of stem cells in meniscal repair.

Thomas Ritter : PhD is a Lecturer in the Dept. of Medicine and a PI at REMEDI. His expertise is in the area of cellular immunology, cornea transplantation and gene therapy.

Eric Farrell : PhD, a post doctoral researcher at REMEDI with specific expertise in osteochondral repair and angiogenesis will work alongside a PhD student on the project

Publications:

1. Duffy GP et al O'Brien T, Barry F. Bone Marrow Derived Mesenchymal Stem Cells Promote Angiogenic Processes in a Time and Dose Dependent Manner. Tissue Eng Part A, 2009 Jan 23 [Epub ahead of print].
2. Rooney GE, Ritter T, O'Brien T et al, Barry F. Neurotrophic Factor-Expressing Mesenchymal Stem Cells Survive Transplantation into the Contused Spinal Cord without Differentiating into Neural Cells. Tissue Eng Part A. 2009 Mar 31 [Epub ahead of print].
3. Mooney E et al, Murphy M*, Barron V*. Carbon Nanotubes and Mesenchymal Stem Cells: Biocompatibility, Proliferation and Differentiation. Nano Lett. 2008 8:2137-43 (* Equal contributors).
4. Ryan JM, Frank Barry F, Murphy JM, Mahon BP. IFN-γ promotes and does not break the immunosuppressive capacity of adult human Mesenchymal stem cells. Clin Exp Immunol 2007 149:353-63.
5. McMahon JM, Murphy M, Barry F & O'Brien T et al. Gene transfer into rat mesenchymal stem cells: a comparative study of viral and non-viral vectors. Stem Cells Dev 2006 15:87-96.

Patents:

1. Irish patent application no. 2007/0170 and PCT/EP2008/052959 – Markers, antibodies and recombinant scFvs for adult mesenchymal stem cells. Inventors: T.O'Brien, F. Barry, U. Greiser, T. Bowes, W. Finlay.
2. Irish patent application no. 2007/0136 and PCT/EP2008/052578 – Genes for the treatment and prediction of vascular diseases. Inventors: T. O'Brien, F. Barry, A. Liew, A. Samali.
3. Irish patent application no. 2009/0236 related to stent coatings to deliver therapeutic genes to coronary arteries. Inventors: F. Sharif, S. Hynes, U. Greiser, T. O'Brien.
4. US patent application no. 12/183,992 relating to stem cell source for promoting neovascularisation. Inventors: T. O'Brien, F. Barry and G. Duffy.
5. Irish Patent application no. 2009/0173 relating to Development of a gene therapy vector for eukaryotic gene therapy applications. Inventors: T.O'Brien, B. McGrath, Padraig Strappe,

Tony Pembroke, Anna Piterina. (Filed 23rd January 2009)

Specific awards and certifications (selected): Science Foundation Ireland: Regenerative Medicine Institute CSET, €14,998,960 (TOB, FB); EU FP7- ADIPOA: Adipose derived stromal cells for osteoarthritis, €463,018.00 (FB); EU FP7- PURSTEM: Serum free conditions for MSCs, €1,111,960 (FB, MM).