



## 4th International Conference "Biomaterials, Tissue Engineering & Medical Devices"



### Brief biographical note

**Prof. Abhay Pandit** is the Director of a Science Foundation Ireland funded Strategic Research Cluster "Network of Excellence for Functional Biomaterials" (NFB) at the National University of Ireland, Galway. Prof Pandit has over 20 years of experience in the field of designing biomaterials for tissue engineering applications. His postgraduate work on the modification of a fibrin scaffold to deliver a therapeutic biomolecule resulted in a clinical trial at the Burn Centre at the University of Alabama at Birmingham. Prof. Pandit's subsequent research in the Wound Care R & D Group at The Kendall Company resulted in a patent and FDA approval for a commercial wound dressing. Prof. Pandit also led the Biomaterials Research Group at Surgical Sealants, Inc. where he received IDE approval for a collagen-based vascular sealant. He was thereafter worked on a tissue-engineered heart valve project (NIST Foundation funded US \$2M) at St. Jude Medical, Inc. Prof Pandit current research programme hosts several patented technology platforms associated with the development of implantable materials for clinical applications. Functionality to these forms is achieved through custom chemistries which facilitate the attachment of surface tethered moieties or encapsulated therapeutic factors including drugs, genes and other active agents. These systems are assessed *in vitro* through living tissue models and specialised *in vivo* models developed in the NFB laboratory. The above focus underlines the following clinical applications; cardiovascular disease, nucleus pulposus regeneration, neural regeneration, Epidermolysis Bullosa, wound healing, osteochondral defects, hernia and thoracic wall repair, staple line reinforcement and adipose tissue regeneration. His research is currently funded by Science Foundation Ireland, 7<sup>th</sup> EU Framework, AO Foundation, Enterprise Ireland, Health Research Board and Dystrophic Epidermal Bullosa Research Association amongst others.

**His professional and scientific activity comprises:** papers published in scientific journals (74); papers published in the proceedings of international or national conferences (269); inventions (16); participating in different international or national research projects (84); member of the scientific committee of different meetings (3); head of the organizing committee for different international conferences (2); member of the International Editorial Board of journals (8) including Biomaterials, Journal of Materials Science: Materials in Medicine, Journal of Tissue Engineering, Journal of Biomedical Materials Research – Part B, The Open Biomaterials Journal, The Open Biomedical Engineering Journal, Recent Patents on Biomedical Engineering and European Cells and Materials; Referee for journals in cognate areas (42); Grant Panellist for funding agencies (5) including The Leverhulme Trust, The Academy of Finland's Panel in Biomedical Engineering, and The Irish-US Fulbright Commission; Grant Reviewer for funding agencies (16) including the 7<sup>th</sup> EU Framework, the UK's Medical Research Council, the AO Foundation, the Wellcome Trust, the Agency for Science, Technology and Research's (A\*STAR) Biomedical Research Council (BMRC), the Engineering and Physical Sciences Research Council (EPSRC), The Biotechnology and Biological Sciences Research Council (BBSRC), The UK's National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs) Research Grants, the Swiss National Science Foundation and the Dutch Burns Foundation; prizes for lectures at international conferences (6); Prof. Pandit will host the Tissue Engineering Regenerative Medicine International Society Conference – EU Meeting in 2010 and The European Society for Biomaterials Conference in 2011 – one of the few groups to host these prestigious conferences in consecutive years.



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**Name , salutation:** Prof. Abhay Pandit  
**Current appointment:** Director  
Network of Excellence for Functional Biomaterials  
IDA Business Park, Dangan  
National University of Ireland, Galway, Ireland



### Educational Background:

- PhD in Biomedical Engineering, Biomaterials Track, University of Alabama at Birmingham, 1998.
- Master of Public Health, International Health, University of Alabama at Birmingham, 1994.
- Master of Science in Biomedical Engineering, Biomaterials Track, University of Alabama at Birmingham, 1991

### Experience:

- **Director**, Network of Excellence for Functional Biomaterials, Science Foundation Ireland, Strategic Research Cluster, National University of Ireland, Galway (2007 – present)
- Personal Professor in Biomedical Engineering, National University of Ireland Galway (2004- present)
- Senior Lecturer in Biomedical Engineering, Department of Mechanical and Biomedical Engineering, National University of Ireland Galway (2002- 2004)
- Principal Research Scientist, St. Jude Medical Inc., St. Paul, Minnesota (2000-2001)
  - Tissue Engineered Heart Valve Prostheses: Led project intended to develop a tissue-engineered heart valve prosthesis that, once implanted, would attract and integrate the patient's own cells in critical areas of the valve, making a more reliable, longer-lasting replacement valve, particularly for children whose bodies outgrow conventional prosthetic valves.
  - Co-Investigators: 3 Academic Centres, 5 Industrial Partners
  - Directed & supervised an interdisciplinary team of 3 PhDs, 1 Scientist and 2 Technicians
- Biomaterials Research Manager, Surgical Sealants Inc., Woburn, Massachusetts (1997-1999)
  - IDE approval of a Photo-Polymerised Collagen Vascular Sealant
  - IDE approval of a Chemically-Cured Collagen Vascular Sealant
  - One patent filing
  - Responsible for saving over \$400K by altering experimental designs
  - Designed *in vivo* and *in vitro* safety and efficacy studies of biological tissue adhesives (vascular, thoracic, neurology, general applications) for FDA submissions
  - Submitted two Small Business Innovative Research (SBIR) grants
  - Negotiated research contracts with universities, clinicians and CROs
  - Set up a Clinical Board



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- Directed & supervised a team of 2 PhDs, 1 Engineer and 1 Technician
- Principal Research Scientist, The Kendall Company, Mansfield, Massachusetts (1994-1997)
  - One patent filing
  - Sat on the business development team for technology assessments
  - Received a 510 (k) approval of a Hydrophilic Wound Dressing
  - Designed competitive wound care products with a profit margin of 60%
  - Managed a project from concept to market (Tenderfix™)
  - Designed marketing (proof of principle) clinical trials
  - Directed & supervised 2 Technicians

### **Research/clinical interest**

Research activity in the field of:

- Synthesis of novel dendrimeric systems
- Methods of production of nanoscaffolds
- Fabrication methods of multistructural and multifunctional scaffolds
- In vitro development of living tissue models
- Development of quantitative systems for characterisation of biological responses
- Development of carrier systems for designer peptides, viral and non-viral gene delivery systems
- Development of extracellular matrix based scaffolds
- Development of tethering mechanism through enzymatic linkages to designer molecules

### **Present areas of research**

The ongoing research work is characterized by the following keywords: Biomaterials, Tissue Engineering, Regenerative Medicine, Tissue-biomaterials Interactions, Functionalised Scaffolds for Medical Applications, Gene Therapy, Targetted Drug Delivery, Novel Dendritic Linking Systems, Medical Devices

**Title of your BIOMMEDD 2010 lecture:**

**Strategies for Functionalization of Nanoscale Biomaterials**