



Biomaterials

Biodegradables

Biomimetics

Further information – www.3bs.uminho.pt

Research Areas

- T1 - Development and modification of natural origin materials**
- T2 - Polymer science applied to the development of new materials**
- T3 - Characterization of biomaterials under dynamic loads**
- T4 - Behaviour in simulated physiological solutions and degradation mechanisms**
- T5 - Processing and characterization of biodegradable systems**
- T6- Surface modification of biomaterials**
- T7 - Bioactivity, biomineralization, biomimetic coatings and bioceramics**
- T8 - Biomaterials-protein interactions**
- T9 - Production of porous biomaterials**
- T10 - Systems for the controlled release of bioactive agents**
- T11 - Hydrogels and degradable bone cements**
- T12 - Membranes and wound dressings of natural origin**
- T13 - Tissue engineering of bone and cartilage**
- T14 - Biocompatibility and immunological responses to biomaterials**
- T15 - *In-vivo* tests**

Multi cultural environment

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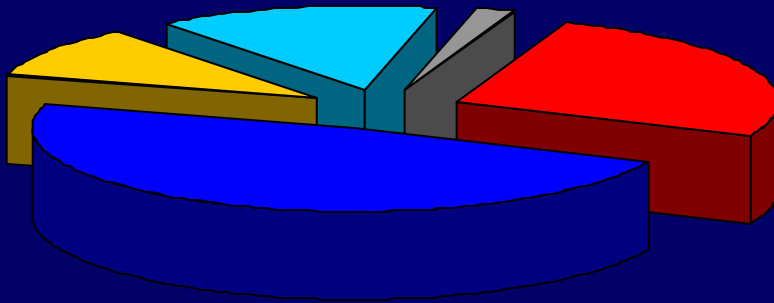
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Multi disciplinary team



Materials & Polymer Eng.

Biology/Biochemistry

Biological & Biomedical Eng.

Chemistry & Chemical Eng.

Medicine / Dentistry

Researchers
background

International research partners

- CSIC - Madrid, SP (Julio San Roman)
- Johannes Guttenberg University – Mainz, D (James Kirkpatrick)
- U. Liverpool, UK, (John Hunt)
- U. Twente, NL, (Dirk Grypma, Jan Feijen)
- Tissue Engineering Res. Centre - Tsukuba, Japan (Atsuo Ito)
- National Univ. Singapore, SG, (Dietmar Hutmacher)
- Rice University, USA (Tony Mikos)
- Univ. Pennsylvania & Thomas Jefferson Univ., USA (P. Ducheyne, I. Shapiro)
- University of Toronto, Canada (John Davies)
- Kyoto University and Chubu Univ., Japan (Tadashi Kokubo)
- Univ. Texas at San Antonio, USA (Mauli Agrawal)
- Ludwig Boltzmann Institute, Trauma – Vienna (Heinz Redl)
- Red Cross Upper Austria, Linz (Christian Gabriel)
- Univ. Aveiro, PT, (João Rocha, Luis Carlos, Maria Helena Fernandes)
- European projects partners

Industrial partners

- **Isotis bv e Progentix bv, Bilthoven, NL**
- **Novamont Spa., IT**
- **US Biomaterials Corp. & NovoMIn, FL, USA**
- **Depuy, Johnson and Johnson, IN, USA**
- **Stratec Medical, CH**
- **Medtronic, IR,**
- **Merck Biomat, D**
- **Enviosiontec, D**
- **Materialise, B**
- **Kedrion, IT**
- **CellMed, D**
- **Grupo AMORIM, PT**
- **Fresenius Medical Care, D**
- **Novozymes, DN**
- **Crioestaminal, PT**

3B's Research Environment

- **Recently created Associated Laboratory - IBB**
- **Headquarters in the AvePark being a flagship of the Technical Park**
- **Synergies with the Associated Laboratory - I3N**
- **Possible synergies with the Iberian Nanotechnology Centre**
- **Technological Plan defined by the government including the Portugal/MIT agreement**
- **Braga/Guimarães polarities tied by the AvePark**
- **7th framework programme of EU**

Marie Curie EST- ALEA JACTA EST



STREP – HIPPOCRATES



IP – GENOSTEM



NoE – EXPERTISSUES



“Novel therapeutic strategies for tissue engineering of bone and cartilage using second generation biomimetic scaffolds”



CONSORTIUM

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CONSORTIUM

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Dietmar Hutmacher, **National Univ. of Singapore, Lab. Biomedical Eng. and Tissue Eng., Singapore**

MAIN GOALS

- Combat and overcome fragmentation of European Research on the field of Tissue Engineering of Bone and Cartilage;
- Join Europe's leading academic centres and several complementary industrial players in a multi-disciplinary consortium to conduct and structure research that is able to compete in the international arena, namely with USA and Japan.

OPPORTUNITIES

- **Nucleate industry and economic activity in high added value product arena;**
- **Conditions to cross-fertilization between the infra-structures being created in the region;**
- **Established network of international partners of excellence;**
- **Good conditions for long term sustainable development of new technology;**
- **Create conditions promoting investments with risk (venture capital is scarce in Portugal and with limited capacity);**
- **Explore regional synergies looking for scale advantages**

CONTRIBUTIONS

- **Internationally driven institutions, able to compete in the global arena;**
- **Constant flow of knowledge, continuously being created and either being protected or disseminated;**
- **High profile of research groups both nationally and internationally;**
- **Multi-cultural atmosphere attracting students from different countries (inverting the brain drain problem);**
- **Creating opportunities for the creation of spin-offs based in the generated knowledge;**
- **Producing highly trained and skilled working force;**

iHUB AvePark

- Ave Park infrastructure;
- New headquarters of the 3B's with the research labs mainly concentrated in a single location
- Operating interface with the School of Medicine
- Operating interface with local Hospitals
- Operating interface with I3N in the AvePark
- Institutional facilities (medical imaging or materials characterization)
- Industrially-driven environment
- Venture capital

FINAL COMMENTS

- Vale do Ave region economically depressed;
- The region shows valuable opportunities for knowledge based industry;
- Research units of Excellence focused in emerging technologies;
- Attractive for foreign researchers;
- Potential good quality of life associated to attractive mid-size cities;
- Long term strategic plan of development.