Biomedical Technologies and Innovation Doctoral Programme (BIOTIN)

Title of the PhD Project	**Cellular adaptations to microgravity**
Acronym	**CELLADAPT**
Research Fields of the Project	Mechanobiology, Biomaterials Science, Tissue Engineering
Keywords	Microgravity, Biofabrication, Stem Cells, Co-culture, Bone
Host Institution, Department and Campus Location	Izmir Institute of Technology, Bioengineering Department, Urla/Izmir
PhD Awarding Institution and Graduate Programme	Izmir Institute of Technology, Graduate School, PhD in Bioengineering
Name and Affiliation of Main Supervisor	Prof. Engin Özçivici (IZTECH)
Name and Affiliation of Cosupervisors	Asst. Prof. Nesli Erdogmus (IZTECH) Assoc. Prof. Bora Garipcan (BOUN)
Research Environment and Infrastructure	PhD candidates will be expected to work in an interdisciplinary environment with access to cell/tissue culture; cellular imaging and molecular biology tools as well as magnetic levitation-based culture technologies.
Scientific Context of the Project	Mechanical signals are essential determinants of cell function and fate. Cessation or absence of mechanical loads such as a sedentary lifestyle, bedrest, stroke or spaceflight leads to a deterioration of tissue health in many organs. For this study, we are interested in bone marrow mimicking 3D cultures and their response to microgravity. On earth microgravity will be facilitated by magnetic manipulation of cells, using diamagnetic levitation systems. Molecular and cellular adaptations to magnetic levitation will be documented and compared to in vivo studies as well as recorded spaceflight data.
Brief Workplan	Proposed studies are expected to be completed in 4 years.

Innovative Aspects of the Project	Ground-based microgravity assessment tools based on magnetic levitation.
Training Opportunities of the Project	Researchers will be involved in the project that will benefit from the networking and complementary scientific expertise of the international research team, which will add value to their career development.
Interdisciplinary Aspects	Expected study involves molecular biology, cell biology, tissue engineering, magnetic manipulation and mechanobiology.
Intersectoral Mobility **☒ Short Visit** **☐ Secondment**	*Host: Fujifilm VisualSonics* *Context of Mobility: In vivo molecular and diagnostic imaging, exploitation of research results, and ethics*
Intersectoral Mobility **☒ Short Visit** **☐ Secondment**	*Host: Istanbul Health Industry Cluster (ISEK)* *Context of Mobility: Entrepreneurship Training, Thematic Pre-incubation Program*
International Academic Secondment	*Host Supervisor: Assistant Professor Gunes Uzer* *Host Institution: Boise State University, Boise, USA* *Host Department: Mechanical and Biomedical Engineering* *Duration: 6 months* *Estimated Time of Mobility: 2nd year*
Main Supervisor	
Brief CV	***Prof. Engin Özçivici*** **E-mail:** enginozcivici@iyte.edu.tr **ACADEMIC DEGREES** Ph.D. Biomedical Engineering Stony Brook University, US 2009 M.Sc. Mechanical Engineering Stony Brook University, US 2005 B.Sc. Mechanical Engineering Dokuz Eylül University 2002 Google Scholar: https://scholar.google.com/citations?hl=en&user=AftoXkUAAAAJ https://orcid.org/0000-0003-4464-0475

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Co-supervisors	
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Brief CV	**Asst. Prof. Nesli Erdoğmuş** **E-mail:** neslierdogmus@iyte.edu.tr **ACADEMIC DEGREES** Ph.D. Multimedia Communications Telecom ParisTech, France 2012 M.Sc. Electrical and Electronics Engineering Middle East Technical University, Turkey 2008 B.Sc. Electrical and Electronics Engineering Middle East Technical University, Turkey 2005 Google Scholar: https://scholar.google.com/citations?hl=en&user=SGO1CAcAAAAJ https://orcid.org/0000-0002-6875-2685