

## ***Engineering and optimization of micro-muscles in vitro***

### **Context**

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Tissue engineering is a promising therapy to address the loss of skeletal muscle tissue function caused by congenital defects, tumor ablation, prolonged denervation, traumatic injury, or different myopathies. Moreover, engineered muscle tissues can be used as model 2D or 3D tissues, in addition to classic 2D cultures and animal models. A major hurdle to the advancement of muscle tissue engineering is the lack of high-throughput tests of a wide range of parameters (cell source, mechanical, soluble and electrical stimuli) in 3D biomimetic environments.

In order to address some actual limitations of tissue engineering, this project aims at generating 3D muscle microtissues *in vitro* using a microfabricated system to study maturation and performance of physiological muscle. The 3D platform will be microfabricated by photolithography and replication in polydimethylsiloxane (PDMS) to generate high-throughput arrays of microtissues embedded in collagen. Functional properties of the muscle microtissues will be evaluated using microscopy. The adhesion, proliferation and differentiation of muscle progenitor cells (myoblasts) will be investigated by means of cell biology methods (immuno-stainings, proliferation assays, confocal microscopy).

### **Lab (<http://www.lmgp.grenoble-inp.fr>)**

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The candidate will be working in the LMGP, Laboratory of Materials and Physical Engineering, in the group Interactions between Materials and Biological Matter (IMBM).

### **Background of the candidate**

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The candidate graduated from college, engineering school and/or Master 2R program with an education focused on material science, biology and biotechnologies. Aptitudes for team work and expression in oral and written English will be appreciated.

### **Salary**

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1700 euros/mois

### **Supervisors**

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Thomas.Boudou@grenoble-inp.fr; Tel: 04 56 52 93 29  
LMGP: 3 Parvis Louis Néel, Grenoble INP, MINATEC, BP 257, 38 016 Grenoble cedex

Catherine.Picart@grenoble-inp.fr; Tel: 04 56 52 93 11  
LMGP: 3 Parvis Louis Néel, Grenoble INP, MINATEC, BP 257, 38 016 Grenoble cedex

