

## Curriculum Vitae:

**ELEONORA BARKA**

### Education

- 01.09.2007 - 31.07.2012** Diploma of Materials Science Engineer, Materials Science & Engineering Department, University of Ioannina, Greece.
- 28.09.2012 - 13.12.2016** PhD from Materials Science & Engineering Department, University of Ioannina, Greece. Thesis title: "*Development of novel tissue-engineering scaffolds for preventing post-myocardial infarction ventricular remodeling*".

### Employment - Professional Career

- 2015** Certification on Laboratory Animal Science European Union Functions Course (Felasa Category A,B,C,D) (LAS Course as stated in article 23 of the Directive 2010/63/EU, according to European Felasa Directions, on experimental animals (Mice & Rats), KAT Hospital, Athens, November 2015).
- 2017** License to practice the Engineer profession in Greece (Technical Chamber of Greece, Registration Number: 141948)
- 2017-** Post-Doctoral Researcher, University of Ioannina, Greece

### Honours and Awards

- 2012** Award of 2<sup>nd</sup> best presentation of young scientist, 5<sup>o</sup> Congress of Hellenic Society of Biomechanics, Thessaloniki, Greece, 28-29/09/2012.
- 2013** Young Researcher Travel Award for 2013" from the Hellenic Society of Biomechanics for participating at the ESB 2013, 25-28 August 2013, Patras, Greece.

### Member of scientific societies

- 2012-** Research member of Cardiovascular Research institute (Care Institute), Greece (www.careinstitute.gr).
- 2012-** Hellenic society of Biomechanics (ELEMBIO)
- 2013-** Hellenic society of Biomaterials (EEB)
- 2013** Hellenic ceramics society (EEK)

### Participation in research projects

- 2013 - 2016** «Effect of biological scaffold and growth hormone on left ventricular remodeling after myocardial infarction in rats». Research Cardiovascular research Institute (www.careinstitute.gr). This work was carried out in the experimental laboratory of the Research Cardiovascular Institute, within the framework of the Scholarship Program of the Research Center of the Pharmaceutical Industry of ELPEN.
- 2014** «Study of heart rat system with uncontrolled epilepsy and control group». Operational Program THESSALY - CENTRAL GREECE EPIRUS 2007-2013 which is co-funded by the European Regional Development Fund (ERDF). This project was carried out at the University of Ioannina and the experimental laboratory of the Research Cardiovascular Institute (Ioannina, Greece).

### Research work

*i. Research Interests:* E. Barka is currently interested in the fabrication of biomaterial scaffolds for tissue engineering applications. She is also interested in the fabrication of delivery systems of drugs and growth factors (Storage, transport and targeted time and local drug delivery). Specifically, she study the myocardial administration of growth hormone molecule (GH) via an alginate -scaffold, following in vitro and in vivo evaluation of degradation and drug-release curves. Briefly, sustained GH-administration enhances angiogenesis and myofibroblast-activation and ameliorates post-infarction remodelling (Daskalopoulos et al., Growth Factor, 2015). Also, intra-myocardial GH preserved electrical conduction and repolarization-dispersion at the infarct-border and decreased the incidence of induced tachyarrhythmias in rats post-ligation (Kontonika, et al., Growth factor, 2017). Furthermore, a cardiovascular progenitor cell population had the capacity to self-renew and further differentiate to endothelial, cardiac and smooth muscle cells in vitro and in vivo, using the alginate biomaterial as delivery system of the cell culture into the myocardium (Maltabe et al., 2017). Also, the medium-term electrophysiologic effect of a pre vascularized alginate scaffold after implantation in the infarcted rat myocardium is being studied. Specifically, mesenchymal stem-cells, exhibiting adequate differentiation capacity, were co-cultured with umbilical-vein

endothelial cells and they were seeded on an alginate-based scaffold. The results revealed low arrhythmogenic potential, but the long-term effects on repolarization dispersion require further investigation (Kolettis et al., 2018 (Under Review)). The spontaneous uptake of  $\text{Ca}^{2+}$ -ions is a unique property of alginate hydrogels, which, along with their high biocompatibility, biodegradability, and morphological similarity to heart tissue, makes them attractive as scaffolding materials in myocardial tissue engineering applications. The influence of  $\text{Ca}^{2+}$  content on the molecular structure and the thermodynamic stability of the alginate hydrogel was determined and the results effectively interpreted the experimental findings, as well. This analysis suggests that in Ca-free or Ca-deficient alginates spontaneous  $\text{Ca}^{2+}$  ions uptake can occur from the biological environment and develop, via chelation reaction, a well-formed and thermodynamically stable hydrogel in situ inside the tissue. Nevertheless, further increase of Ca-content in alginate structure beyond this peak results in products with poorer thermodynamic stability (Barka et al, J Biomed Mater Res B Appl Biomater (in press, 2018)).

## ii. Research Publications

E.B. has published 8 papers in international peer-reviewed journals and 1 article is under review. She also has 24 presentations in Greek and International conferences.

### List of Research publications:

1. T. M. Kolettis, D. L. Oikonomidis, M. E. Baibaki, **E. Barka**, M. Kontonika, D. G. Tsalikakis, A. Papalois, Zenon S. Kyriakides, Endothelin B-receptors and sympathetic activation: Impact on ventricular arrhythmogenesis during acute myocardial infarction, **Life Sciences**, (2014), 118(2):281-7.

2. M. Kontonika, **E. Barka**, E. P. Daskalopoulos, A. D. Vilaeti, A. Papalois, S. Agathopoulos, Th. M. Kolettis, Effects of Myocardial Alginate Injections on Ventricular Arrhythmias after Experimental Ischemia Reperfusion, **Trends Biomater Artif Organs**, (2014); 28:79-82.

3. Th. M. Kolettis, M. Kontonika, **E. Barka**, E. P. Daskalopoulos, G. G. Baltogiannis, Ch. Tourmousoglou, A. Papalois, Z. Kyriakides, Central Sympathetic Activation and Arrhythmogenesis during Acute Myocardial Infarction: Modulating Effects of Endothelin-B Receptors, **Front Cardiovasc Med**. (2015); 2:6

4. E. P. Daskalopoulos,\* A. D. Vilaeti,\* **E. Barka**,\* P. Mantzouratou, D. Kouroupis, M. Kontonika, Ch. Tourmousoglou, A. Papalois, W.M. Blankesteyn, S. Agathopoulos, Th.M. Kolettis, Attenuation of post-infarction remodeling in rats by sustained myocardial growth hormone administration. **Growth Factors**, (2015);12:1-9. \*: Equal Contribution of the first three authors

5. M.Kontonika, **E. Barka**, M. Roumpi, A. D. Vilaeti, G. G. Baltogiannis, A. P. Vlahos, S. Agathopoulos, Theofilos M. Kolettis, Intra-myocardial growth hormone administration ameliorates arrhythmogenesis during ischemia-reperfusion in rats. **Journal of Electrocardiology**, 2016;18(16):30274-30276.

6. V. Baltabe, **E. Barka**, M. Kontonika, D. Florou, M. Kouvara- Pritsouli, M. Roympi, S. Agathopoulos, Th. M. Kolettis, P. Kouklis, Isolation of an ES-derived cardiovascular multipotent cell population based on VE-cadherin promoter activity, **Stem Cells International**, (2016). p. 8305624.

7. M. Kontonika, **E. Barka**, M. Roumpi, V. La Rocca, P. Lekkas, E. P. Daskalopoulos, A.D. Vilaeti, G.G. Baltogiannis, A.P. Vlahos, S. Agathopoulos, Th.M. Kolettis, , Prolonged intra-myocardial growth hormone administration ameliorates post-infarction electrophysiologic remodeling in rats. **Growth Factors**, 2017;35:1-11.

8. **E. Barka**, D. Papayiannis, Th. M. Kolettis, S. Agathopoulos, Optimization of the concentration of  $\text{Ca}^{2+}$  ions in alginate hydrogel used for injection in myocardium after acute infarction, **Journal of Biomedical Materials Research Part B (Applied Biomaterials)**, 2018, In Press.

9. Th. M. Kolettis, E. Bagli, **E. Barka**, D. Kouroupis, M. Kontonika, A. D Vilaeti, M. Markou, M. Roumpi. V. A Maltabe, V. La Rocca, S. Agathopoulos, Th. Fotsis, Medium-term electrophysiologic effects of a cellularized-scaffold implanted in rats after myocardial infarction. **Cardiovascular Drugs and Therapy**, 2018, Under review.