

## **Curriculum vitae**

**Name:** **Despina Deligianni**  
**Academic Position:** Associate Professor; Director of the Laboratory of Biomechanics and Biomedical Engineering  
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## **Studies**

- NTUA, Athens, Greece (1980) Diploma in Civil Engineering
- University of Patras, Patras, Greece (1991) PhD in Bone Biomechanics, Department of Mechanical Engineering & Aeronautics

## **Academic experience**

**2009-today:** Associate Professor, Laboratory of Biomechanics and Biomedical Technology, Department of Mechanical Engineering & Aeronautics, University of Patras

**2000-2009:** Assistant Professor, Laboratory of Biomechanics and Biomedical Technology, Department of Mechanical Engineering & Aeronautics, University of Patras

**1993-2000:** Lecturer, Laboratory of Biomechanics and Biomedical Technology, Department of Mechanical Engineering & Aeronautics, University of Patras

**1981-1993:** Research Assistant, Laboratory of Biomechanics and Biomedical Technology, Department of Mechanical Engineering & Aeronautics, University of Patras

**1995:** two-month stay at INSERM-U.306, Université de Bordeaux II (Erasmus fellowship)

**1989:** five-month stay at the University of London, Queen Mary & Westfield College (part of PhD carrying out)

**1989:** two-month stay at the Academy of Sciences of the Czech Republic, Institute of Theoretical and Applied Mechanics, Prague (part of PhD carrying out)

## **Teaching of the following courses**

Biomechanics (1992-today)

Biomaterials (1999-today)

Artificial Organs (2002-today)

Strength of Materials (1981-1991)

## **Conference organising**

19<sup>th</sup> Congress of the ESB, Patras 2013: member of the organising committee

6<sup>th</sup> Congress of the Hellenic Society of Biomechanics, Patras, 2014: president of the organising committee.

## **Supervision of the following PhDs**

**1. Apostolopoulos KN,** "Ultrasound propagation through cancellous bone *in vitro*. Influence of the microstructural changes on ultrasound backscatter using an experimental model of osteoporosis", 2008.

**2. Kokkinos P,** "Study of conditions and parameters which enhance osseointegration of orthopaedic

implants *in vitro*:  $\alpha$ . Influence of mechanical stimulation,  $\beta$ . Influence of micro- or nanosurface topography", 2008.

3. **Kroustalli A**, "Study of cells-nanostructured biomaterials interface"

4. **Bairaktari C**, "Development of an e-health system in orthopaedics"

### Research activities

- Cancellous bone mechanical behaviour and its modeling
- Ultrasonic propagation through cancellous bone and osteoporosis modeling for its early diagnosis
- Design and analysis of osteosynthesis devices
- Cell-biomaterial interactions
- Development of composite nanobiomaterials for orthopedic or generally biomedical applications
- Cell mechanics (quantification of cell adhesion, cell culture under static and dynamic loading) - Mechanotransduction

### Reviewer of the following journals

- Acta Biomaterialia
- Applied Surface Science
- Biomaterials
- Biomechanics and Modeling in Mechanobiology
- BioMed Research International, **Editorial Board**
- Journal of Acoustic Society of America
- Journal of Biomechanics
- Journal of Biomedical Material Research A
- Journal of Biomedical Material Research B
- Journal of Biomedical Nanotechnology
- Journal of Composite Materials
- Lagmuir
- Materials Science and Engineering C
- Structural Engineering and Mechanics, An international Journal
- Surface and coatings technology
- The Scientific World Journal

### Member of the Societies

- Technical Chamber of Greece
- Greek Society of Civil Engineers
- ISMNI (International Society of Musculoskeletal and Neuronal Interactions)
- Hellenic Society of Biomechanics
- Hellenic Society of Biomaterials
- European Society of Biomechanics

### Referred Publications

- B1. TG CHONDROS, **DD DELIGIANNI**, KF MILIDONIS, IT CHONDROU, G MARGARONIS, Wire tensioning with integrated load-cell in the Ilizarov orthopaedic external fixation system. *Mechanism and Machine Theory* 79, 2014, 109-123.
- B2. A. KROUSTALLI, S. KOURKOULI, **D. DELIGIANNI**, Cellular function and adhesion mechanisms of human bone marrow mesenchymal stem cells on multi-walled carbon nanotubes. *Annals of Biomedical Engineering*, 41(12), 2013, 2655-2665.

- B3. KROUSTALLI A, ZISIMOPOULOU AE, KOCH S, RONGEN L, **DELIGIANNI D**, DIAMANTOUROS S, ATHANASSIOU G, KOKOZIDOU M, MAVRILAS D, JOCKENHOEVEL S, Carbon nanotubes reinforced chitosan films: mechanical properties and cell response of a novel biomaterial for cardiovascular tissue engineering. *J Mater Sci Mater Med.*, 24(12), 2013, 2889-2896.
- B4. D. PORTAN, A KROUSTALLI, **D. DELIGIANNI**, G PAPANICOLAOU On the Biocompatibility between TiO<sub>2</sub> Nanotubes Layer and Human Osteoblasts, *Journal of Biomedical Materials Research, Part A*, 100A (10), 2012, 2546-53.
- B5. PA. KOKKINOS, PG KOUTSOUKOS AND **DD. DELIGIANNI**, Detachment strength of human osteoblasts cultured on hydroxyapatite with various surface roughness. Contribution of integrin subunits. *J Mater Sci Mater Med*, 23(6), 2012, 1489-98.
- B6. I PAGOULATOU, I-E TRIANTAPHYLLIDOU, DH. VYNIOS, DJ. PAPACHRISTOU, E KOLETIS, **D DELIGIANNI**, D MAVRILAS, Biomechanical and structural alterations followed decellularization of bovine pericardial tissues for use as scaffold in tissue engineering. *J Mater Sci Mater Med*, 23(6), 2012, 1387-96.
- B7. PA. KOKKINOS, R WRIGHT, PB. KIRBY, AND **DD. DELIGIANNI**, Differential Regulation of Osteoblasts by Microstructural Features of Titanium Substrata, *Trends Biomater. Artif. Organs*, 26(1), 16-24 (2012)
- B8. V. KALERIDIS, G. ATHANASSIOU, **D. DELIGIANNI** and Y. MISSIRLIS, Slow flow of passive neutrophils and sequestered nucleus into micropipette. *Journal of Clinical hemorheology and microcirculation* 45, 2010, 53-65.
- B9. E. KALFARETZOS, **D. DELIGIANNI**, G. MITROS and M. TYLLIANAKIS, Biomechanical evaluation of plating techniques for fixing mandibular angle fractures: The introduction of a new 3D plate approach. *Oral and Maxillofacial Surgery* 13 (3), 2009, 139-144.
- B10. C.A. APOSTOLOPOULOS and **D.D. DELIGIANNI**, Prediction of local cellular deformation in bone-Influence of microstructure dimensions. *Journal of Neuronal and Musculoskeletal Interactions* 9(2), 2009, 99-108.
- B11. P. KOKKINOS, I. ZARKADIS, T. PANIDIS and **D. DELIGIANNI**, Estimation of hydrodynamic shear stresses developed on human osteoblasts cultured on Ti-6Al-4V and strained by four point bending. Effects of mechanical loading to specific gene expression. *Journal of Materials Science: Materials in Medicine* 20, 2009, 655-65.
- B12. **D.D. DELIGIANNI** and C.A. APOSTOLOPOULOS, Reply to the Letter to the Editor commenting on "Multilevel finite element modeling for the prediction of local cellular deformation in bone by Deligianni DD and Apostolopoulos CA (2008) *Biomech Model Mechanobiol* 7(2): 151-159.
- B13. P KOKKINOS, I ZARKADIS, D KLETSAS, **D DELIGIANNI**, KOKKINOS, I ZARKADIS, D KLETSAS, **D DELIGIANNI**. Effects of physiological mechanical strains on the release of growth factors and the expression of differentiation marker genes in human osteoblasts growing on Ti-6Al-4V. *Journal of Biomedical Materials Research, Part A*, 90(2), 2009, 387-395.
- B14. **DD DELIGIANNI** and CA APOSTOLOPOULOS. Multilevel finite element modeling for the prediction of local cellular deformation in bone. *Biomechanics and Modeling in Mechanobiology* 7(2), 2008, 151-9.
- B15. APOSTOLOPOULOS KN and **DELIGIANNI DD**, Influence of microarchitecture alterations on ultrasonic backscattering in an experimental simulation of bovine cancellous bone aging. *J Acoust Soc Am* 123(2), 2008, 1179-87.
- B16. **DELIGIANNI DD** and APOSTOLOPOULOS KN Characterization of dense bovine cancellous bone tissue microstructure by ultrasonic backscattering using weak scattering models. *J Acoust Soc Am* 122(2), 2007, 1180-1190.
- B17. KOROVISSIS P, **DELIGIANNI D**, MAVRILAS D and PETSINIS G. Inherent stiffness of three different posterior transpendicular fixation instrumentation. A mechanical comparative study. *European Journal of Orthopaedic Surgery and Traumatology* 17(6), 2007, 553-560.
- B18. TYLLIANAKIS M, **DELIGIANNI D**, et al. Biomechanical comparison of callus over a locked intramedullary nail in various segmental bone defects in a sheep model. *Medical Science Monitor* 13(5), 2007, BR125-BR130.

- B19. KN APOSTOLOPOULOS and **DD DELIGIANNI**, Influence of microarchitecture on cancellous bone ultrasonic backscatter. In: *ADVANCED TOPICS IN SCATTERING AND BIOMEDICAL ENGINEERING*. Proceedings of the 8<sup>th</sup> International Workshop on Mathematical Methods in Scattering Theory and Biomedical Engineering. Lefkada, Greece, 27 - 29 September 2007. Editors: A Charalambopoulos, D Fotiadis & D Polyzos. World Scientific Publishing Company, Imperial College Press.
- B20. KOROVISSIS PG, MAGNISSALIS EA, **DELIGIANNI D**, Biomechanical evaluation of conventional internal contemporary spinal fixation techniques used for stabilization of complete sacroiliac joint separation: a 3-dimensional unilaterally isolated experimental stiffness study. *Spine* **31(25)**, 2006, E941-51.
- B21. **DELIGIANNI D**, KOROVISSIS P, PORTE-DERRIEU MC, AMEDEE J, REPANTIS T, Experimental usage of hydroxyapatite preadsorption with fibronectin to increase permanent stability and longevity of spinal implants. *Stud Health Technol Inform* **123**, 2006, 289-98.
- B22. **DELIGIANNI D**, KOROVISSIS P, PORTE-DERRIEU MC, AMEDEE J, Fibronectin preadsorbed on hydroxyapatite together with rough surface structure increases osteoblasts' adhesion "in vitro": The theoretical usefulness of fibronectin preadsorption on hydroxyapatite to increase permanent stability and longevity in spine implants. *J Spinal Disorders & Techniques* **18(3)**, 2005, 257-262.
- B23. **D. DELIGIANNI** and K. APOSTOLOPOULOS, Anisotropy of Ultrasonic Backscatter and Attenuation from Cancellous Bone. In: *Advances in Scattering and Biomedical Engineering*. World Scientific 2004, Editors: D Fotiadis, CV Massalas.
- B24. P. KOROVISSIS, **D. DELIGIANNI**, G. PETSINIS, A. BAIKOYSIS, Comparative strength measurements of five different fixation systems applied on an in vitro model of femoral midshaft osteotomy. *Eur J Orthop Surg Traumatol*, **12**, 2002, 61-68.
- B25. PG KOROVISSIS, **DD DELIGIANNI** and LG LENKE, Role of surface roughness of titanium versus hydroxyapatite on human bone marrow cell response. *J Spinal Disord Tech* **15(2)**, 2002, 175-83.
- B26. G. ATHANASSIOU and **D. DELIGIANNI**, Adhesion strength of individual human bone marrow cells to fibronectin. Integrin  $\beta$ 1-mediated adhesion. *J Mater Sci: Mater Med* **12 (10-12)**, 2001, 965-970.
- B27. **D. DELIGIANNI**, N. KATSALA, S. LADAS, D. SOTIROPOULOU, J. AMEDEE, Y. MISSIRLIS, Effect of surface roughness of the titanium alloy Ti-6Al-4V on human bone marrow cell response and on protein adsorption. *Biomaterials* **22(11)**, 2001, 1241-1251.
- B28. **D. DELIGIANNI**, N. KATSALA, P. KOUTSOUKOS, Y. MISSIRLIS, Effect of surface roughness of hydroxyapatite on human bone marrow cells adhesion, proliferation, differentiation and detachment strength. *Biomaterials* **22(1)**, 2001, 87-96.
- B29. P. KOROVISSIS, A. BAIKOYSIS, **D. DELIGIANNI**, Y. MISSIRLIS and P. SOUKAKOS, Effectiveness of Transfixation and Length of Instrumentation on Titanium and Stainless Steel Transpedicular Spine Implants. *J Spinal Disorders* **14(2)**, 2001, 109-117.
- B30. **D. DELIGIANNI**, P. KOROVISSIS, A. BAIKOYSIS, Y. MISSIRLIS, Factor analysis of the effectiveness of transfixation and rod characteristics on the TSRH screw-rod instrumentation. *J Spinal Disord.* **13(1)**, 2000, 50-7.
- B31. P. KOROVISSIS, **D. DELIGIANNI**, M. STAMATAKIS, Y. MISSIRLIS, Augmentation of anterior transvertebral screws using threaded teflon anchoring. *J Spinal Disorders* **11(4)**, 1998, 300-306.
- B32. Y. MISSIRLIS, D. MAVRILAS, **D. DELIGIANNI**, M. DAUNER, H. PLANK, L. CARAMARO, P. MEGAS, Resorbable fiber reinforced polylactide polymers for osteosynthesis. In "Advanced Composites in Emerging Technologies" edited by S.A.Paipetis and A.G. Youtsos, University of Patras, Appl. Mechanics Lab., ISBN 969-85676-0-2, 1995.
- B33. Y.F. MISSIRLIS, D. MAVRILAS, **D. DELIGIANNI**, Test methodology for characterizing in-vitro biodegradation. *Journal of Biomaterials Science-Polymer Edition* **6(9)**, 1995, 775-856.
- B34. **D. DELIGIANNI**, A. MARIS AND Y. MISSIRLIS, Stress relaxation behaviour of trabecular bone specimens. *Journal of Biomechanics* **27**, 1994, 1469-1476.
- B35. **D.D. DELIGIANNI**, Y.F. MISSIRLIS, V. KAFKA, Determination of material constants and hydraulic strengthening of trabecular bone through an orthotropic structural model. *Biorheology* **31(3)**, 1994, 245-257.

- B36. **D.D. DELIGIANNI**, K.E. TANNER, Y.F. MISSIRLIS, and W. BONFIELD Mechanical behaviour of trabecular bone of the human femoral head in females. *J. Mat. Science: Materials in Medicine* **2**, 1991, 168-175
- B37. **D. DELIGIANNI**, A.S. PANTAZOPOULOS, A mathematical model for automatic pattern recognition on the structure of cancellous bone. *Proceedings of the International AMSE Conference "Modelling & Simulation", Cairo, March 2-4, 1987, p. 85-98.*

**Citations:** More than 860 (Scopus).

### **Current EU Funded Research Projects**

“E-Iliza- Development of an e-health system in orthopaedics”, LEADERA 2011, SEVEN FRAMEWORK PROGRAMME