

# Aikaterini Berdiaki MSc PhD

## Personal details

Telephone: 00302810-394745; e-mail: [berdiaki@uoc.gr](mailto:berdiaki@uoc.gr)

## Education

1996-1999: **BSc in Molecular and Cellular Biology, University of Kent at Canterbury: Graduated with Upper Second Class 2(i) Honours.**

1999-2000: **MSc Course in Clinical Biochemistry with Molecular Biology, University of Surrey**

2001- 2006: **PhD Institute of reproductive and developmental biology, Imperial College.** PhD studentship founded by Wellbeing. Title: 'Peroxisome Proliferator-activated receptor  $\gamma$  action in the human ovary'.

## Current Position

2023-present: Assistant Professor of Histology Embryology, Medical School, University of Crete

**Research:** Investigation of the role of hyaluronan and hyaluronan receptor RHAMM in fibrosarcoma cell functions. In addition, the role of proteoglycans, other glycosaminoglycans and growth factors are studied in several cancer cell lines: fibrosarcoma, osteosarcoma, melanoma, breast and colon; importance in tumor.

In addition, age-related changes in endometrial cell function and differential gene expression that affect receptivity of human endometrium.

## Previous Positions

2006- 2023: Postdoc University of Crete, School of Medicine, Laboratory of Anatomy-Histology-Embryology.

2005-2007: Postdoc University of Crete, School of Medicine, Laboratory of Histology-Embryology funded by the European Union and the Greek government (IIYΘAΓOPAΣ II) 'Investigation of molecules important in HDL/LDL homeostasis and in the differentiation of macrophages to foam cells, as prognostic markers in atherosclerosis'

2013- 2014: Postdoc University of Crete, School of Medicine, Laboratory of Histology-Embryology in collaboration with the University of Patras, Department of Biochemistry.

Research: funded by the European Union and the Greek government (ΘAΛHΣ) titled 'The role of intracellular interaction of ER $\alpha/\beta$  with EGF-R and IGF-R in the growth and progression of breast cancer '.

2014-2015: Postdoc University of Crete, School of Medicine, Laboratory of Pharmacology

Research: funded by the European Union and the Greek government (APIΣTEIA) titled 'Targeting RGS9-2 in the brain in order to fight for addiction and chronic pain'.

2018- 2023: Postdoc University of Crete, School of Medicine, Laboratory of Human Reproduction

## Teaching experience

**2007-present:** teaching position at the University of Crete, School of Medicine, Laboratory of Histology-Embryology. Teaching medical students the subjects of Embryology and Histology. Assisted in the supervision of 13 PhD students in the field of extracellular matrix and cancer.

**2021-present:** Gynecology: a) Research in Human infertility b) Male fertility testing.

**2017 February-2017 September:** teaching position at the University of Crete, School of Medicine, Department of Morphology. Teaching to 3<sup>rd</sup> year medical students the subject of Cytology. Funded by the Greek government.

**2022- International Society for In Vitro fertilization (ISIVF) Webinar, SIG Endometrium and RIF, The role of platelet-rich plasma in IVF/RIF FEB 5 SATURDAY.** Title: Technical aspect of PRP preparation

**2007-2013:** Teaching seminars for graduate students, founded by the European Union and the Greek government at the University of Crete, School of Medicine. The program was titled 'Diagnostics and therapeutics aspects of the 21<sup>st</sup> century'.

**2005-2006:** Institute of reproductive and developmental biology, Imperial College. Supervision of two MSc students in the subject of Developmental Biology.

## Presentations in International Conferences

I have presented my scientific work in 41 International Conferences and 16 National Conferences.

Selected poster presentations:

- **Berdiaki A.**, Zafiroopoulos A., Fthenou E., Chalkiadakis G., Tzanakakis G.N. FGF regulates HA biosynthesis in fibrosarcoma cells through modulation of HAS isoform balance in favour of HAS1. FEBS Advanced Lecture Course, Matrix Pathobiology, Signaling and Molecular Targets, Patras, Greece, May 21-26 2007. (P72)
- **Berdiaki A.**, Nikitovic D., Kouvidi A., Syrogianni H., Tzanakakis GN. bFGF induces changes in hyaluronan synthase and hyaluronidase isoform expression and modulates the migration capacity of fibrosarcoma cells. 34<sup>th</sup> FEBS Congress, Prague, Czech, 4-9 July 2009. (Ph-95)
- Kouvidi K., **Berdiaki A.**, Mytilineou M., Nikitovic D., Tzanakakis GN. Role of RHAMM in low molecular weight hyaluronan (LMWHA) mediated fibrosarcoma cell adhesion. P11.722011: 36<sup>th</sup> FEBS Congress, Torino, Italy, June 25-30
- Kouvidi K., **Berdiaki A.**, Nikitovic D., Tzanakakis GN. Hyaluronan/RHAMM receptor signaling in fibrosarcoma cell proliferation 4th FEBS Advanced Lecture Course, FEBS – MPST 2013, Matrix Pathobiology, Signaling and Molecular Targets, Kos, Greece, September 26 – October 1, 2013
- Kouvidi K., **Berdiaki A.**, Tzardi M., Karousou E., Passi A., Nikitovic D., Tzanakakis GN. Receptor for hyaluronic acid-mediated motility (RHAMM) regulates HT1080 fibrosarcoma cell proliferation via a b-catenin/c-myc signalling axis. 2<sup>nd</sup> MBE (Matrix Biology Europe) Conference, Athens, Greece, June 11-14, 2016 ST44/P113

## Publications

1. Tsatsakis, A.; Oikonomopoulou, T.; Nikolouzakis, T. K.; Vakonaki, E.; Tzatzarakis, M.; Flamourakis, M.; Renieri, E.; Fragkiadaki, P.; Iliaki, E.; Bachlitzanaki, M.; Karzi, V.; Katsikantami, I.; Kakridonis, F.; Hatzidaki, E.; Tolia, M.; Svistunov, A. A.; Spandidos, D. A.; Nikitovic, D.; Tsiaoussis, J.; Berdiaki, A., Role of telomere length in human carcinogenesis (Review). *Int J Oncol* **2023**, *63* (1).
2. Berdiaki, A.; Neagu, M.; Spyridaki, I.; Kuskov, A.; Perez, S.; Nikitovic, D., Hyaluronan and Reactive Oxygen Species Signaling- Novel Cues from the Matrix? *Antioxidants (Basel)* **2023**, *12* (4).
3. Berdiaki, A.; Giatagana, E. M.; Tzanakakis, G.; Nikitovic, D., The Landscape of Small Leucine-Rich Proteoglycan Impact on Cancer Pathogenesis with a Focus on Biglycan and Lumican. *Cancers (Basel)* **2023**, *15* (14).
4. Kuskov, A.; Nikitovic, D.; Berdiaki, A.; Shtilman, M.; Tsatsakis, A., Amphiphilic Poly-N-vinylpyrrolidone Nanoparticles as Carriers for Nonsteroidal, Anti-Inflammatory Drugs: Pharmacokinetic, Anti-Inflammatory, and Ulcerogenic Activity Study. *Pharmaceutics* **2022**, *14* (5).
5. Giatagana, E. M.; Berdiaki, A.; Gaardlos, M.; Tsatsakis, A. M.; Samsonov, S. A.; Nikitovic, D., Rapamycin-induced autophagy in osteosarcoma cells is mediated via the biglycan/Wnt/beta-catenin signaling axis. *Am J Physiol Cell Physiol* **2022**, *323* (6), C1740-C1756.
6. Giatagana, E. M.; Berdiaki, A.; Gaardlos, M.; Samsonov, S. A.; Tzanakakis, G. N.; Nikitovic, D., Biglycan Interacts with Type I Insulin-like Receptor (IGF-IR) Signaling Pathway to Regulate Osteosarcoma Cell Growth and Response to Chemotherapy. *Cancers (Basel)* **2022**, *14* (5).
7. Berdiaki, A.; Zafeiropoulou, S.; Makrygiannakis, F.; Drakopoulos, P.; Gurgan, T.; Makrigiannakis, A., Ageing, a modulator of human endometrial stromal cell proliferation and decidualization: a role for implantation? *Reprod Biomed Online* **2022**, *45* (2), 202-210.
8. Berdiaki, A.; Kuskov, A. N.; Kulikov, P. P.; Thrapsanioti, L. N.; Giatagana, E. M.; Stivaktakis, P.; Shtilman, M. I.; Tsatsakis, A.; Nikitovic, D., In Vitro Assessment of Poly-N-Vinylpyrrolidone/Acrylic Acid Nanoparticles Biocompatibility in a Microvascular Endothelium Model. *Int J Mol Sci* **2022**, *23* (20).
9. Tzanakakis, G. N.; Giatagana, E. M.; Berdiaki, A.; Spyridaki, I.; Hida, K.; Neagu, M.; Tsatsakis, A. M.; Nikitovic, D., The Role of IGF/IGF-IR-Signaling and Extracellular Matrix Effectors in Bone Sarcoma Pathogenesis. *Cancers (Basel)* **2021**, *13* (10).
10. Nikolouzakis, T. K.; Vakonaki, E.; Stivaktakis, P. D.; Alegakis, A.; Berdiaki, A.; Razos, N.; Souglakos, J.; Tsatsakis, A.; Tsiaoussis, J., Novel Prognostic Biomarkers in Metastatic and Locally Advanced Colorectal Cancer: Micronuclei Frequency and Telomerase Activity in Peripheral Blood Lymphocytes. *Front Oncol* **2021**, *11*, 683605.
11. Giatagana, E. M.; Berdiaki, A.; Tsatsakis, A.; Tzanakakis, G. N.; Nikitovic, D., Lumican in Carcinogenesis- Revisited. *Biomolecules* **2021**, *11* (9).
12. Berdiaki, A.; Neagu, M.; Giatagana, E. M.; Kuskov, A.; Tsatsakis, A. M.; Tzanakakis, G. N.; Nikitovic, D., Glycosaminoglycans: Carriers and Targets for Tailored Anti-Cancer Therapy. *Biomolecules* **2021**, *11* (3).
13. Tzanakakis, G.; Giatagana, E. M.; Kuskov, A.; Berdiaki, A.; Tsatsakis, A. M.; Neagu, M.; Nikitovic, D., Proteoglycans in the Pathogenesis of Hormone-Dependent Cancers: Mediators and Effectors. *Cancers (Basel)* **2020**, *12* (9).
14. Papoutsidakis, A.; Giatagana, E. M.; Berdiaki, A.; Spyridaki, I.; Spandidos, D. A.; Tsatsakis, A.; Tzanakakis, G. N.; Nikitovic, D., Lumican mediates HTB94 chondrosarcoma cell growth via an IGF-IR/Erk1/2 axis. *Int J Oncol* **2020**, *57* (3), 791-803.

15. Berdiaki, A.; Perisynaki, E.; Stratidakis, A.; Kulikov, P. P.; Kuskov, A. N.; Stivaktakis, P.; Henrich-Noack, P.; Luss, A. L.; Shtilman, M. M.; Tzanakakis, G. N.; Tsatsakis, A.; Nikitovic, D., Assessment of Amphiphilic Poly-N-vinylpyrrolidone Nanoparticles' Biocompatibility with Endothelial Cells in Vitro and Delivery of an Anti-Inflammatory Drug. *Mol Pharm* **2020**, *17* (11), 4212-4225.
16. Tsatsakis, A.; Stratidakis, A. K.; Goryachaya, A. V.; Tzatzarakis, M. N.; Stivaktakis, P. D.; Docea, A. O.; Berdiaki, A.; Nikitovic, D.; Velonia, K.; Shtilman, M. I.; Rizos, A. K.; Kuskov, A. N., In vitro blood compatibility and in vitro cytotoxicity of amphiphilic poly-N-vinylpyrrolidone nanoparticles. *Food Chem Toxicol* **2019**, *127*, 42-52.
17. Kavasi, R. M.; Berdiaki, A.; Spyridaki, I.; Papoutsidakis, A.; Corsini, E.; Tsatsakis, A.; Tzanakakis, G. N.; Nikitovic, D., Contact allergen (PPD and DNCB)-induced keratinocyte sensitization is partly mediated through a low molecular weight hyaluronan (LMWHA)/TLR4/NF-kappaB signaling axis. *Toxicol Appl Pharmacol* **2019**, *377*, 114632.
18. Tzanakakis, G.; Kavasi, R. M.; Voudouri, K.; Berdiaki, A.; Spyridaki, I.; Tsatsakis, A.; Nikitovic, D., Role of the extracellular matrix in cancer-associated epithelial to mesenchymal transition phenomenon. *Dev Dyn* **2018**, *247* (3), 368-381.
19. Nikitovic, D.; Berdiaki, A.; Spyridaki, I.; Krasanakis, T.; Tsatsakis, A.; Tzanakakis, G. N., Proteoglycans-Biomarkers and Targets in Cancer Therapy. *Front Endocrinol (Lausanne)* **2018**, *9*, 69.
20. Aggelidakis, J.; Berdiaki, A.; Nikitovic, D.; Papoutsidakis, A.; Papachristou, D. J.; Tsatsakis, A. M.; Tzanakakis, G. N., Biglycan Regulates MG63 Osteosarcoma Cell Growth Through a LPR6/beta-Catenin/IGFR-IR Signaling Axis. *Front Oncol* **2018**, *8*, 470.
21. Mytilinaiou, M.; Nikitovic, D.; Berdiaki, A.; Papoutsidakis, A.; Papachristou, D. J.; Tsatsakis, A.; Tzanakakis, G. N., IGF-I regulates HT1080 fibrosarcoma cell migration through a syndecan-2/Erk/ezrin signaling axis. *Exp Cell Res* **2017**, *361* (1), 9-18.
22. Mytilinaiou, M.; Nikitovic, D.; Berdiaki, A.; Kostouras, A.; Papoutsidakis, A.; Tsatsakis, A. M.; Tzanakakis, G. N., Emerging roles of syndecan 2 in epithelial and mesenchymal cancer progression. *IUBMB Life* **2017**, *69* (11), 824-833.
23. Kavasi, R. M.; Berdiaki, A.; Spyridaki, I.; Corsini, E.; Tsatsakis, A.; Tzanakakis, G.; Nikitovic, D., HA metabolism in skin homeostasis and inflammatory disease. *Food Chem Toxicol* **2017**, *101*, 128-138.
24. Voudouri, K.; Nikitovic, D.; Berdiaki, A.; Tsiaoussis, J.; Kletsas, D.; Karamanos, N. K.; Tzanakakis, G. N., Data on the putative role of p53 in breast cancer cell adhesion: Technical information for adhesion assay. *Data Brief* **2016**, *9*, 568-572.
25. Voudouri, K.; Nikitovic, D.; Berdiaki, A.; Papachristou, D. J.; Tsiaoussis, J.; Spandidos, D. A.; Tsatsakis, A. M.; Tzanakakis, G. N., Heparin regulates B6FS cell motility through a FAK/actin cytoskeleton axis. *Oncol Rep* **2016**, *36* (5), 2471-2480.
26. Voudouri, K.; Nikitovic, D.; Berdiaki, A.; Kletsas, D.; Karamanos, N. K.; Tzanakakis, G. N., IGF-I/EGF and E2 signaling crosstalk through IGF-IR conduit point affects breast cancer cell adhesion. *Matrix Biol* **2016**, *56*, 95-113.
27. Nikitovic, D.; Kouvidi, K.; Kavasi, R. M.; Berdiaki, A.; Tzanakakis, G. N., Hyaluronan/Hyaladherins - a Promising Axis for Targeted Drug Delivery in Cancer. *Curr Drug Deliv* **2016**, *13* (4), 500-11.
28. Nikitovic, D.; Kavasi, R. M.; Berdiaki, A.; Papachristou, D. J.; Tsiaoussis, J.; Spandidos, D. A.; Tsatsakis, A. M.; Tzanakakis, G. N., Parathyroid hormone/parathyroid hormone-related peptide regulate osteosarcoma cell functions: Focus on the extracellular matrix (Review). *Oncol Rep* **2016**, *36* (4), 1787-92.
29. Kouvidi, K.; Berdiaki, A.; Tzardi, M.; Karousou, E.; Passi, A.; Nikitovic, D.; Tzanakakis, G. N., Receptor for hyaluronic acid-mediated motility (RHAMM) regulates HT1080 fibrosarcoma cell proliferation via a beta-catenin/c-myc signaling axis. *Biochim Biophys Acta* **2016**, *1860* (4), 814-24.
30. Voudouri, K.; Berdiaki, A.; Tzardi, M.; Tzanakakis, G. N.; Nikitovic, D., Insulin-like growth factor and epidermal growth factor signaling in breast cancer cell growth: focus on endocrine resistant disease. *Anal Cell Pathol (Amst)* **2015**, *2015*, 975495.
31. Nikitovic, D.; Tzardi, M.; Berdiaki, A.; Tsatsakis, A.; Tzanakakis, G. N., Cancer microenvironment and inflammation: role of hyaluronan. *Front Immunol* **2015**, *6*, 169.
32. Nikitovic, D.; Berdiaki, A.; Galbiati, V.; Kavasi, R. M.; Papale, A.; Tsatsakis, A.; Tzanakakis, G. N.; Corsini, E., Hyaluronan regulates chemical allergen-induced IL-18 production in human keratinocytes. *Toxicol Lett* **2015**, *232* (1), 89-97.
33. Nikitovic, D.; Mytilinaiou, M.; Berdiaki, A.; Karamanos, N. K.; Tzanakakis, G. N., Heparan sulfate proteoglycans and heparin regulate melanoma cell functions. *Biochim Biophys Acta* **2014**, *1840* (8), 2471-81.
34. Nikitovic, D.; Kouvidi, K.; Voudouri, K.; Berdiaki, A.; Karousou, E.; Passi, A.; Tzanakakis, G. N., The motile breast cancer phenotype roles of proteoglycans/glycosaminoglycans. *Biomed Res Int* **2014**, *2014*, 124321.
35. Kouvidi, K.; Nikitovic, D.; Berdiaki, A.; Tzanakakis, G. N., Hyaluronan/RHAMM interactions in mesenchymal tumor pathogenesis: role of growth factors. *Adv Cancer Res* **2014**, *123*, 319-49.
36. Nikitovic, D.; Berdiaki, A.; Banos, A.; Tsatsakis, A.; Karamanos, N. K.; Tzanakakis, G. N., Could growth factor-mediated extracellular matrix deposition and degradation offer the ground for directed pharmacological targeting in fibrosarcoma? *Curr Med Chem* **2013**, *20* (23), 2868-80.
37. Mytilinaiou, M.; Bano, A.; Nikitovic, D.; Berdiaki, A.; Voudouri, K.; Kalogeraki, A.; Karamanos, N. K.; Tzanakakis, G. N., Syndecan-2 is a key regulator of transforming growth factor beta 2/Smad2-mediated adhesion in fibrosarcoma cells. *IUBMB Life* **2013**, *65* (2), 134-43.
38. Nikitovic, D.; Chalkiadaki, G.; Berdiaki, A.; Aggelidakis, J.; Katonis, P.; Karamanos, N. K.; Tzanakakis, G. N., Lumican regulates osteosarcoma cell adhesion by modulating TGFbeta2 activity. *Int J Biochem Cell Biol* **2011**, *43* (6), 928-35.

39. Kouvidi, K.; Berdiaki, A.; Nikitovic, D.; Katonis, P.; Afratis, N.; Hascall, V. C.; Karamanos, N. K.; Tzanakakis, G. N., Role of receptor for hyaluronic acid-mediated motility (RHAMM) in low molecular weight hyaluronan (LMWHA)-mediated fibrosarcoma cell adhesion. *J Biol Chem* **2011**, *286* (44), 38509-38520.
40. Datsis, G. A.; Berdiaki, A.; Nikitovic, D.; Mytilineou, M.; Katonis, P.; Karamanos, N. K.; Tzanakakis, G. N., Parathyroid hormone affects the fibroblast growth factor-proteoglycan signaling axis to regulate osteosarcoma cell migration. *FEBS J* **2011**, *278* (19), 3782-92.
41. Chalkiadaki, G.; Nikitovic, D.; Katonis, P.; Berdiaki, A.; Tsatsakis, A.; Kotsikogianni, I.; Karamanos, N. K.; Tzanakakis, G. N., Low molecular weight heparin inhibits melanoma cell adhesion and migration through a PKCa/JNK signaling pathway inducing actin cytoskeleton changes. *Cancer Lett* **2011**, *312* (2), 235-44.
42. Chalkiadaki, G.; Nikitovic, D.; Berdiaki, A.; Katonis, P.; Karamanos, N. K.; Tzanakakis, G. N., Heparin plays a key regulatory role via a p53/FAK-dependent signaling in melanoma cell adhesion and migration. *IUBMB Life* **2011**, *63* (2), 109-19.
43. Chatzinikolaou, G.; Nikitovic, D.; Berdiaki, A.; Zafiropoulos, A.; Katonis, P.; Karamanos, N. K.; Tzanakakis, G. N., Heparin regulates colon cancer cell growth through p38 mitogen-activated protein kinase signalling. *Cell Prolif* **2010**, *43* (1), 9-18.
44. Berdiaki, A.; Datsis, G. A.; Nikitovic, D.; Tsatsakis, A.; Katonis, P.; Karamanos, N. K.; Tzanakakis, G. N., Parathyroid hormone (PTH) peptides through the regulation of hyaluronan metabolism affect osteosarcoma cell migration. *IUBMB Life* **2010**, *62* (5), 377-86.
45. Chalkiadaki, G.; Nikitovic, D.; Berdiaki, A.; Sifaki, M.; Krasagakis, K.; Katonis, P.; Karamanos, N. K.; Tzanakakis, G. N., Fibroblast growth factor-2 modulates melanoma adhesion and migration through a syndecan-4-dependent mechanism. *Int J Biochem Cell Biol* **2009**, *41* (6), 1323-31.
46. Berdiaki, A.; Nikitovic, D.; Tsatsakis, A.; Katonis, P.; Karamanos, N. K.; Tzanakakis, G. N., bFGF induces changes in hyaluronan synthase and hyaluronidase isoform expression and modulates the migration capacity of fibrosarcoma cells. *Biochim Biophys Acta* **2009**, *1790* (10), 1258-65.
47. Nikitovic, D.; Berdiaki, K.; Chalkiadaki, G.; Karamanos, N.; Tzanakakis, G., The role of SLRP-proteoglycans in osteosarcoma pathogenesis. *Connect Tissue Res* **2008**, *49* (3), 235-8.
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49. Kousidou, O.; Berdiaki, A.; Kletsas, D.; Zafiropoulos, A.; Theocharis, A. D.; Tzanakakis, G. N.; Karamanos, N. K., Estradiol-estrogen receptor: a key interplay of the expression of syndecan-2 and metalloproteinase-9 in breast cancer cells. *Mol Oncol* **2008**, *2* (3), 223-32.
50. Berdiaki, A.; Zafiropoulos, A.; Fthenou, E.; Katonis, P.; Tsatsakis, A.; Karamanos, N. K.; Tzanakakis, G. N., Regulation of hyaluronan and versican deposition by growth factors in fibrosarcoma cell lines. *Biochim Biophys Acta* **2008**, *1780* (2), 194-202.

### Books

- I. Nikitovic D., Pratsinis H, Berdiaki A., Gialeli C., Kletsas D., and Tzanakakis G.N.; *Extracellular Matrix: Pathobiology & signaling* (DeGruyter, Berlin, 2012) Chapter 8.3: Growth factor signaling and extracellular matrix.
- II. Nikitovic D., Kavasi R.M., Moraiti R, Berdiaki A., Aggelidakis J., Tzanakakis GN. Chapter 3: OSTEOSARCOMA CELL FUNCTIONS- FOCUS ON EXTRACELLULARMATRIX SIGNALING. *Horizons in Cancer Research*. Volume 62. NovaSciencePublishers, Inc. NY, 2015
- III. Nikitovic D., Berdiaki A. *Encyclopedia of Toxicology*. Chapter "Developmental Toxicology. Title: Male reproductive system. In print

### Author Links:

- 1) [https://scholar.google.com/citations?view\\_op=list\\_works&hl=en&hl=en&user=SfV9WqoAAAJ&pagesize=80](https://scholar.google.com/citations?view_op=list_works&hl=en&hl=en&user=SfV9WqoAAAJ&pagesize=80)
- 2) <https://www.scopus.com/authid/detail.uri?authorId=23134593900>