NIKOS K. KARAMANOS, Ph. D., Professor

SHORT PRESENTATION / PROFILE

Nikos K. Karamanos is a Professor of Biochemistry in the University of Patras. He obtained his diploma (Chemistry) in 1984 and Ph.D. (Biochemistry) in 1988 from the University of Patras. He has carried out pre- and postdoctoral research work (annual periods, total three years) at Karolinska Institute (School of Medicine, Stockholm, Sweden). He is a member of the editorial boards of several peer-review journals *[The Journal of Biological Chemistry, Current Medicinal Chemistry, Biomedical Chromatography, Current Pharmaceutical Analysis, Current Chemical Biology and Chromatographia (2004-2009)]* and acts as a reviewer in a number (>25) of peer review scientific journals.

He is a member of the board of the Hellenic Society of Biochemistry and Molecular Biology (President 2006-2007, Vice-President 2008-2009 & 2010-2011, General Secretary 2004-2005), co-ordinator of connective tissue and matrix biology research society (2003-present) and an expert in FP7 "Health" (2007-2009). He is the chairman of the FEBS Advanced Lecture Courses in "Matrix Pathobiology, Signaling and Molecular Targets" held in Patras (May 2007 and July 2009). Dr. Nikos Karamanos is co-author of more than 180 original publications in peer review international journals. His work is cited more than 2000 times and his H index is 24.

RESEARCH INTERESTS

Extensive experience in the areas of matrix pathobiolchemistry, cell signaling, molecular targeting and preclinical evaluation of drugs at cell level. More focus is given to proteoglycans, glycosaminoglycans, metalloproteinases and acidic glycoproteins and especially to their implication in tissue organization and the pathogenesis and progression of various disorders, such as cancer and atherosclerosis. The signal transduction pathways mediating their production by various normal or cancer cells and the regulation of their expression by cytokines and growth factors are also studied. In addition, this group has long-lasting expertise in the development of very sensitive bioanalytical methods and their application to identify macromolecular structure-activity relationship in physiological and pathological conditions as well as in pharmacokinetic studies

DETAILED DATA

Present address: University of Patras, Department of Chemistry, Laboratory of Biochemistry, Section of Organic Chemistry, Biochemistry and Natural Products, 261 10 Patras, Greece, Phone +30-2610-997915 (office), 997181 (lab.), Fax: +30-2610-997153

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Education, degrees & scientific carrier

1984 & 1988	Diploma (Chemistry, grade A) and Ph.D. (Biochemistry, grade A), Department of Chemistry, University of Patras
1987-1999	Researcher and Post doc Research Fellow (annual periods, total 3-years) at Karolinska Institute, Dept. of Laboratory Medicine, School of Medicine, Stockholm, Sweden
1990-2002	Lecturer (1990), Assistant Professor (1993), Associate Professor (1999), Dept of Chemistry, University of Patras
2003-present	Professor of Biochemistry & Organic Biochemical Analysis, University of Patras

2003-present	President of the Hellenic Research Club for Connective Tissue and Matrix Biology and contact person in Federation of European Connective Tissue Societies (FECTS)
2004-2005	Secretary General of the Hellenic Society of Biochemistry and Molecular Biology
2006-2007	President of the Hellenic Society of Biochemistry and Molecular Biology
2008-present	Vice-President of the Hellenic Society of Biochemistry and Molecular Biology
2007-2009	European Union Expert, FP7, theme "Health"
2010-present	Collaborative Faculty Member of the Institute ICE-HT (FORTH), Patras, Greece
2007-present	Head of the Department of Chemistry, University of Patras

Awards & Editorial Scientific Boards

Participation in the editorial boards and action as reviewer in about 30 peer review scientific journal in the areas of Biochemistry, Biochemical & Pharmaceutical Analysis, Cell Biology, Molecular Biology, Anticancer Agents, Oncology, Cancer, Matrix Biology, Cell signaling, Targeted Molecular Therapeutic Approaches, Extracellular Matrix, Drug Pharmacological Evaluation and Cancer.

A number of awards has been conferred by various Scientific Societies, among them the Biochemical-Molecular Biology Society, Society for Microbiology and Biopathology, Pediatrics, Society for Anticancer Research, European associated Societies Comet and Leonardo Da Vinci, Neurological Society, Federation of European Connective Tissue Societies, etc

Research interests

Main topic**:** Matrix Biology, Cell Signaling in Cancer Development, Functional Invasiveness, Molecular Targets, Biological Testing, Structure Analysis of Carbohydrates

- Structure and functions of metalloproteinases (MMPs), cell bound and cell-secreted proteoglycans (PGs)/ glycosaminoglycans (GAGs) and acidic glyco-and sialoproteins in malignancy.
- Effects of growth factors and their receprors on gene expression and synthesis of MMPs and PGs
- Structure, function, immunological and biological properties of carbohydrates, proteoglycans and glycoproteins
- Carbohydrates and related compounds produced from pathogenic bacteria
- Development, validation and biological applications of high-performance liquid chromatographic & capillary electrophoretic methods for fine biochemical and structural analysis of carbohydrates, proteoglycans and glycoproteins in biological samples (Cell cultures, tissues, biological matrices)
- Structure, analysis and interactions of important biological molecules (growth factors/peptides, amino acid derivatives)

Organization of workshops, meetings/symposia

Chairman of two European conferences (Euro Advanced HPLC course, 1992 and on Microseparation techniques 1998).

S*cientific secretary* of FECTS-2000 International Conference and member of the Organizing/Scientific Committee in a number of Hellenic Conferences on matrix Biology/Connective tissue and Medicinal Chemistry as organizer or member of the committee.

Scientific Secretary and *International contact person* for the 33rd FEBS Congress and 11th IUBMB Conference, Athens, 2008.

Chairman of the 60th Conference of the Helllenic Society of Biochemistry and Molecular Biology, Athens, 2009.

Chairman of the FEBS advanced lecture courses on Matrix Pathobiology, Signaling and Molecular Targets (FEBS-MPST in 2007 website: www.chemistry.upatras.gr/febs-mpst2007 and in 2009 website: www.febs-mpst2009.upatras.gr).

Quest editor:

1. Special issue: CE of carbohydrates (Analysis of carbohydrate macromolecules by capillary electrophoresis: glycoproteins, proteogycans/glycosaminoglycans and glycolipids), *Biomedical Chromatography, Wiley Interscience*, Vol. 16 (2002).
2. Special issue: Solid phase assays for molecules with biopharmaceutical importance, *J. Pharm. Biomed. Analysis, Elsevier*, Vol. 34 (2004).
3. Special issue: Matrix Pathobiology, Signaling and Molecular Targets, Conn. Tissue Res. (2008) Vol. 49, issues 2 & 3.
4. MiniReview Series (R. Iozzo and N. Karamanos, coordinators): Proteoglycans in Health and Disease: emerging concepts and future directions, FEBS J, Vol. 277 (2010) http://onlinelibrary.wiley.com/doi/10.1111/j.1742-4658.2010.07796.x/pdf

Teaching experience-Trainees

Undergraduate teaching: Lectures in Biochemistry, Clinical Chemistry, Molecular Cell Biology and Chemistry of Organic Natural Products.

Graduate teaching: Courses Masters & Ph.D.: Lectures on Advanced Biochemistry I and II, Molecular Biology & Molecular Biotechnology, Clinical Biochemistry, Analytical Biochemistry (HPLC, HPCE, SFC), Immunochemical Assays (ELISA, RIA) and on Isolation and characterization of proteins, enzymes & glycoconjugates

Trainees: Supervisor for 10 Ph.D. and 24 M.Sc. awarded studies, 5 PhD and 5 MSc under progress. For further details press here.

Publications/books

- More than 180 publications (Research and Reviews) in international peer review journals.
- 23 Publications as chapters in book series and full proceeding
- 3 books on biomolecules structure-function and enzyme immunoassays
- More than 250 abstracts in proceedings of International and Hellenic scientific conferences
- More than 70 invited and plenary lectures in International (including FECTS-2004 Italy and FEBS-2010 Sweden), Hellenic scientific conferences and International Research Institutes and Universities

Collaborations and Research Networks

Collaboration at International level with Karolinska Institute, School of Medicine, Sweden and the University of Insubria, School of Medicine, Varese-Italy. At National level with School of Medicine and Pharmacy (Univ. of Patras), Institute of Biology "Demokritos" and Dept of Pharmacy (Univ. of Athens), School of Medicine (Univ. of Crete), Dept of Chemistry, Lab of Biochemistry (Thessaloniki), University Hospital (Patras, Larissa, Thessaloniki and Athens).

Coordinator of the University of Patras Research Network: *Biotargeting - Biomedical and Biotechnological Applications Research Network*. It covers a broad spectrum of continuously evolving research in biomedicine and biotechnology. This network focuses on two basic axes of overlapping activities and as a result of this collaboration of the research groups and researchers from 3 Schools (Natural Sciences, Health Sciences and Engineering) and 6 Departments (Chemistry, Chemical Engineering, Medicine, Pharmacy, Material Science and Mechanical Engineering & Aeronautics) of the University of Patras (www.biotargeting.upatras.gr).

Research Project

Coordination of a number of National (15) and International (2) research projects.

Recent Representative Publications

For a more detailed list of publication in peer review journals: www.publicationslist.org/n.k.karamanos

- Metalloproteinases in Cancer Progression and their Pharmacological Targeting
  C. Gialeli, A. D. Theocharis and N. K. Karamanos
  FEBS J. (2010) "in press"
- Proteoglycans in health and disease: novel roles for proteoglycans in malignancy and their pharmacological targeting.
  A.D. Theocharis, S.S .Skandalis, G.N. Tzanakakis and N.K. Karamanos.
  FEBS J. 277 (2010) 3904-23
- Strategies to target epidermal growth factor receptor in solid tumors: critical evaluation of the biological importance of therapeutic monoclonal antibodies.
  Ch. Gialeli, D. Kletsas, D. Mavroudis, H.P. Kalofonos, G.N. Tzanakakis, N.K. Karamanos.
  Current Med. Chem. 16 (9) (2009) 3797-3808.
- The impact of zoledronic acid therapy in survival of lung cancer patients with bone metastasis.
  K. Zarogoulidis, E. Boutsikou, P. Zaropoulidis, E. Eleftheriadou, T. Kontakiotis, G.N. Tzanakakis, J. Kanakis, N. K. Karamanos.
  *Int. J. Cancer*125 (1) (2009) 705-709.
- Fibroblast growth factor-2 modulates melanoma adhesion and migration through a syndecan-4-dependent mechanism
  G. Chalkiadaki, D. Nikitovic, A. Berdiaki, M. Sifaki, K. Krasagakis, P. Katonis, N. K Karamanos and G.N. Tzanakakis
  Int. J. Biochem. Cell Biol . 41: 6 (2009) 1323-1331
- Estradiol-estrogen receptor: a key interplay of the expression of syndecan-2 and metalloproteinase-9 in breast cancer cells.
  O.Ch. Kousidou, A. Berdiaki, D. Kletsas, A. Zafiropoulos, A. D. Theocharis, G.N. Tzanakakis and N. K. Karamanos
  Mol. Oncology 2 (3) (2008) 223-232.
- Imatinib mesulate inhibits proliferation and exerts an antifibrotic effect in human breast stroma fibroblast.
  V. Gioni, T. Karampinas, G. Voutsinas, A.E. Roussidis, S. Papadopoulos, N.K. Karamanos and D. Kletsas.
  Mol. Cancer Res, 6 (5) (2008) 706-714.
- Chondroitin sulfate and heparan sulfate-containing proteoglycans are both partners and targets of basic fibroblast growth factor-mediated proliferation in human metastatic melanoma cell lines.
  D. Nikitovic, M. Assouti, M. Sifaki, P. Katonis, K. Krasagakis, N.K. Karamanos and G.N. Tzanakakis.
  Int. J. Biochem. Cell Biol., 40 (1) (2008) 72-83.
- Chondroitin sulfate prevents platelet derived growth factor-mediated phosphorylation of PDGF-Rbeta in normal human fibroblasts severely impairing mitogenic responses.
  E Fthenou, A Zafiropoulos, P Katonis, A Tsatsakis, N.K. Karamanos and G.N. Tzanakakis.
  J. Cell Biochem. 103: 6 (2008) 1866-1876.
- Imatinib inhibits colorectal cancer cell growth and suppresses stromal-induced growth stimulation, MT1-MMP expression and pro-M-MP2 activation.
  X. N. Stahtea, A. E. Roussidis, I. Kanakis, G. N. Tzanakakis, G. Chalkiadakis, D. Mavroudis, D. Kletsas and N. K. Karamanos.
  Int. J. Cancer 121 (12) (2007) 2808-2814.
- Decorin-induced growth inhibition is overcome through protracted expression and activation of epidermal growth factor receptors in osteosarcoma cells.
  A. Zafiropoulos, D. Nikitovic, P. Katonis, A. Tsatsakis, N.K. Karamanos and G.N. Tzanakakis.

Mol. Cancer Res. 6: 5 (2008) 785-794.

- Capillary electrophoresis for the quality control of chondroitin sulfates in raw materials and formulations.
  C. Malavaki, A. Asimakopoulou, F. Lamari, A.D. Theocharis, G.N. Tzanakakis and N.K. Karamanos.
  Anal. Biochem. 374 (2007) 213-220.
- Design, synthesis and evaluation of the antiproliferative activity of a series of novel fused xanthenone aminoderivatives in human breast cancer cells.
  V. Giannouli, I. Kostakis, N. Pouli, P. Marakos, O. Kousidou, G.N. Tzanakakis and N.K. Karamanos.
  J. Med. Chem. 50 (7) (2007) 1716-1719.
- The importance of c-Kit and PDGF receptors as potential targets for molecular therapy in breast cancer.
  A. Roussidis, A. D. Theocharis, G. N. Tzanakakis and N. K. Karamanos.
  Current Med. Chem. 14 (7) (2007) 735-743.
- Serglycin constitutively secreted by myeloma plasma cells is a potent inhibitor of bone mineralization in vitro.
  A.D. Theocharis, C. Seidel, M. Borset, K. Dobra, V. Baykov, V. Labropoulou, I. Kanakis, E. Dalas, N. K. Karamanos, A. Sundan, A. Hjerpe.
  J. Biol. Chem. 281 (2006) 35116-35128.
- Effects of the natural isoflavonoid genistein on growth, signaling pathways and gene expression of matrix macromolecules by breast cancer cells.
  O. Ch. Kousidou, G. N. Tzanakakis and N. K. Karamanos
  Mini Rev. Med. Chem. 6: 3(2006) 331-337.

Representative Chapters in International Book Series

- High-performance capillary electrophoretic analysis of hyaluronan in effusions from human malignant mesothelioma.
  N.K. Karamanos, A. Hjerpe.
  In Capillary Electrophoresis in the Life Sciences (Krstulovic, A.M. editor), Elsevier, 1997.
- Proteoglycans: biological roles and strategies for isolation and determination of their glycan constituents.
  N.K. Karamanos.
  In Proteome and Protein Analysis (R. M. Kamp, D. Kyriakides, D. Choli-Papadopoulou, eds) Springer-Verlag, Heidelberg, 1999, pp. 314-329.
- Disaccharide composition in glycosaminoglycans/proteoglycans analyzed by capillary zone electrophoresis.
  N.K. Karamanos and A. Hjerpe.
  In Methods in Molecular Biology (Book Series)*: Proteoglycan Protocols,* (R. Iozzo, ed.) Humana Press, USA, Vol. 171, 2001, pp. 181-192.
- Intact and oligomeric glycosaminoglycans analyzed by capillary electrophoresis.
  N.K. Karamanos and A. Hjerpe.
  In Methods in Molecular Biology (Book Series)*: Proteoglycan Protocols,* (R. Iozzo, ed.) Humana Press, USA, Vol. 171, 2001, pp. 193-198.
- *Domain mapping in glycosaminoglycans using specific enzymes, high–performance liquid chromatography and capillary electrophoresis*
  F. Lamari and N.K. Karamanos.
  In Analytical Techniques to Evaluate the Structure and Functions of Natural Polysaccharides, Glycosaminoglycans (N. Volpi, ed) Signpost and Transworld Research Network, USA, 37/661, (2002), pp. 31-51.

- Capillary electrophoresis of intact and depolymerized glycosaminoglycans and proteoglycans. N.K. Karamanos and A. Hjerpe.
  In Carbohydrate Analysis by Modern Chromatography and Capillary Electrophoresis (Z. El Rassi, ed) Elsevier, USA, 2002, pp. 799-826.
- Chondroitin sulfate as a key molecule in the development of atherosclerosis and cancer progression. A. Theocharis and N. K. Karamanos
  In Advances in Pharmacology: Chondroitin Sulfate: Structure, Role and Pharmacological Activity 53 (2006) 281-295.

Useful links

Departmental & Personal website: www.chem.upatras.gr/faculty/karamanos
List of Publications: www.publicationslist.org/n.k.karamanos
Publications in Medline: www.ncbi.nlm.nih.gov/sites/entrez?db=pubmed&cmd=historysearch&querykey=1
Research Network: www.biotargeting.upatras.gr
Advanced Lecture Courses:
www.febs-mpst2009.upatras.gr, www.chemistry.upatras.gr/febs-mpst2007
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www.jbc.org
www.bentham.org/cmc
http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1099-0801
www.bentham.org/cpa
www.bentham.org/ccb
Scientific Societies/Board Member: www.eebmb.gr