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GSOTIROPOULOU SHORT CV0716-RESEARCH PROJECTS-PUBLICATIONS

GROUP MEMBERS □ □ **GROUP LEADER**

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□ **ONGOING RESEARCH PROJECTS** □

1. [KLK5 drug target in skin](#)

Book Chapter

[Pharmacological targeting of the human tissue kallikrein-related peptidases.](#)

Pampalakis G, Sotiropoulou G. (2012) In **"Proteinases as Drug Targets"**, pp 199-228. Edited by Ben M. Dunn, Royal Society of Chemistry (RSC), RSC Drug Discovery, UK, RSC Publishing.

RESEARCH HIGHLIGHTS

1. [KLK cascades in normal physiology and disease states](#) (& link: http://www.jbc.org/site/tables/contents/proteolytic_enzymes/)
2. [Tumor protective role for KLK6 in breast cancer](#)
3. [Epigenetic silencing of KLK6 in breast cancer-Modes of pharmacological modulation](#)
4. [The "expanded" integrated circuit of the cancer-cell](#)
5. [The human kallikrein gene cluster](#)
6. [Crystal structure of pro-KLK6 at 1,8 Å](#)
7. [New technologies - Proteomic profiling](#) □

RESEARCH INTERESTS

- Molecular mechanisms underlying cancer development, invasion/metastasis: tumor suppressors; identification of cancer-associated genes/proteins for the development of targeted pharmaceutical compounds & molecular diagnostics.
- Proteases and protease inhibitors. Kallikrein-related proteases (KLKs).
- Protease inhibitors (proteins/peptides, LMW/synthetic, aptamers)
- Cancer epigenetics: Pharmacological modulation/unmasking of epigenetically silenced tumor suppressors; epigenetic markers.
- Tumor micrometastasis: Minimal residual cancer. Tumor biomarkers.

- Animal models for human diseases.
- Production and engineering of recombinant proteins

TEACHING

UNDERGRADUATE COURSES:

Cellular Biology

Recommended Textbooks:

Βασικές Αρχές Κυτταρικής Βιολογίας , ΠΑΣΧΑΛΙΔΗΣ (2006)

Greek Edition of "**Essential Cell Biology**", 2nd Edition (2003)

Alberts B, Bray D, Hopkin K, Johnson A, Lewis J, Raff M, Roberts K, Walter P.

Το Κύτταρο: Μια Μοριακή Προσέγγιση Ι. ΜΠΑΣΔΡΑ (2011)

Greek Edition of "**The Cell: A Molecular Approach**", 5th Edition (2009) Geoffrey M. Cooper and Robert Hausman

Suggested Publications or further study

1. Hanahan D, Weinberg RA. Hallmarks of cancer: the next generation . Cell 144: 646-674, 2011; Hanahan D, Weinberg RA.

The hallmarks of cancer

. Cell 100: 57-70, 2000

2. Lord CJ, Ashworth A. Biology-driven cancer drug development: back to the future . BMC Biol 8: 38, 2010

Pharmaceutical Biotechnology

Recommended Textbooks:

Φαρμακευτική Βιοτεχνολογία. Βασικές Αρχές και Πρακτικές Εφαρμογές . 1st Greek Edition of "

Pharmaceutical Biotechnology. Fundamentals and Applications

" by Daan J.A. Crommelin, Robert D. Sindelar, Bernd Meibohm, 3rd Edition, Informa Healthcare (2008). Published by Parisianou Scientific Editions (2011). Επιμέλεια Ελληνικής Έκδοσης: Αστέριος Σ. Τσιφτσόγλου και Γεωργία Σωτηροπούλου

Ανασυνδυασμένο DNA. Γονίδια και Γονιδιώματα-Μια Συνοπτική Παρουσίαση . 1st Greek Edition of "Recombinant DNA. Genes and Genomes-A Short Course" by James Watson, Amy Caudy, Richard Myers, Jan Witkowski, W. H. Freeman and Company, Cold Spring Harbour Laboratory Press, 3rd Edition (2007). Published by Basdra Academic Editions (2007)

Pharmaceutical Biotechnology-Laboratory Exercises

Available in eclass

POSTGRADUATE COURSES:

Pharmaceutical Biotechnology
Specific topics in Clinical Chemistry

COLLABORATING LABORATORIES

1. Department of Pathology and Laboratory Medicine, Mount Sinai Hospital and Department of Laboratory Medicine and Pathobiology, University of Toronto, Toronto, Ontario, CANADA (Prof. Eleftherios P. Diamandis)

ACDC Lab University of Toronto: www.acdcLab.org

2. Department of Molecular Genetics, University of Toronto and Mount Sinai Hospital and Samuel Lunenfeld Research Institute, Toronto, Ontario, CANADA (Prof. Andras Nagy και Dr. Iacovos Michael)

<http://www.mshri.on.ca/nagy/> ; <http://www.lunenfeld.ca/researchers/nagy>

3. Université Paris 5 René Descartes, Hôpital Necker enfants maladies, Services de Génétique et de Dermatologie, Inserm U781 , France (Prof. Alain Hovnanian)

<http://www.fondationimagine.org/uk/Research/ScientificGroups/Formoftheteams/AlainHovnanian.aspx>

4. Neurodegenerative Diseases Group, Basic Neurosciences, Centre of Preventive Medicine, Neurosciences, & Social Psychiatry, Biomedical Research Foundation (BRF) of the Academy of Athens (Dr. Kostas Vekrellis)

http://www.bioacademy.gr/Faculty/investigators_details_new.php?id=31&inv=0&:ovr=0

5. Laboratory of Analytical Chemistry, Analysis of Circulating Tumor Cells (ACTC) Lab, Department of Chemistry, University of Athens, Greece (Prof Evi Lianidou)

<http://en.actc-lab.chem.uoa.gr/>

6. Laboratory of Tumor Cell Biology, School of Medicine, University of Crete; Departments of Pathology and Medical Oncology, University General Hospital of Heraklion, Crete, Greece.(Profs Vassilis Georgoulis and Dimitrios Mavroudis

<http://oncology.med.uoc.gr/>; <http://oncology.med.uoc.gr/mavroudis.htm>

7. Biomedical Applications Unit, Institute of Biological Research and Biotechnology. National Hellenic Research Foundation (Research Assoc Prof Vassilis Zoumpourlis)

<http://www.eie.gr/nhrf/institutes/ibrb/serviceunits/bau-en.html>

8. Metabolic Engineering - Bioinformatics Programme Institute of Biological Research and Biotechnology. National Hellenic Research Foundation (Research Associate Aristotelis Chatziioannou)

<http://www.eie.gr/nhrf/institutes/ibrb/programmes/metabolicengineering-en.html>

Organization Of Meetings - Conferences - Workshops
Upcoming

"Advanced in Circulating Tumour Cells (ACTC): From Basic Research to Clinical Practice"

Astir Palace Vouliagmeni - Westin Resort, Attiki, Greece, 26-29 September 2012;

<http://www.actc2012.org/>

SELECTED PUBLICATIONS

1. Pampalakis G, Obasuyi O, Papadodima O, Chatziioannou A, Zoumpourlis V, **Sotiropoulou G.** (2013) [The KLK5 protease suppresses breast cancer by repressing the mevalonate pathway](#) . Oncotarget, Advance Publications 2013
2. **Sotiropoulou G**, Pampalakis G. (2012) [Targeting the kallikrein-related peptidases for drug development](#) . Trends Pharmacol Sci 33: 623-634.
3. **Sotiropoulou G**, Pampalakis G, Prosnikli E, Evangelatos GP, Livaniou E. (2012) [Development and immunochemical evaluation of a novel chicken IgY antibody specific for KLK6](#) . Chem Cent J 6: 148.
4. Chimonidou M, Tzitzira A, Strati A, **Sotiropoulou G**, Sfikas C, Malamos N, Georgoulas V, Lianidou E. (2012) [CST6 promoter methylation in circulating cell-free DNA of breast cancer patients](#) . Clin Biochem 46: 235-240
5. Kapasa M, Vlachakis D, Kostadima M, **Sotiropoulou G**, Kossida S. (2012) [Towards the elucidation of the regulatory network guiding the insulin producing cells' differentiation](#) . Genomics 100: 212-221.
6. Chimonidou M, Strati A, Tzitzira A, **Sotiropoulou G**, Malamos N, Georgoulas V, Lianidou ES. (2011) [DNA methylation of tumor suppressor and metastasis suppressor genes in circulating tumor cells](#) . Clin Chem 57: 1169-1177.
7. Arnold S, Pampalakis G, Kantiotou K, Silva D, Cortez C, Missailidis S, **Sotiropoulou G.** (2011) [One round of SELEX for the generation of DNA aptamers directed against KLK6.](#) Biol Chem 393: 343-353.
8. Papanastasiou AD, Pampalakis G, Katsaros D, **Sotiropoulou G.** . (2011) [Netrin-1 overexpression is predictive of ovarian malignancies.](#) Oncotarget 2011 May 2 [Epub ahead of print]
9. Pavlopoulou A, Pampalakis G, Michalopoulos I, **Sotiropoulou G.** (2010) [Reconstruction of the evolutionary history of tissue kallikreins](#) . PLoS ONE 5: e13781-13781.

10. Lianidou ES, Mavroudis D, **Sotiropoulou G**, Aggelaki S, Pantel K. (2010) [What's new on Circulating Tumor Cells? A meeting report.](#)
Breast Cancer Res 12: 307-311.
11. **Sotiropoulou G**, Pampalakis G. (2010) [Evolving concepts of tissue kallikrein-related peptidases as bridges of immune function and proteolytic destruction of extracellular matrix](#)
. Biol Chem 391: 321-331.
12. **Sotiropoulou G**, Pampalakis G, Diamandis EP. (2009) [Functional roles of human kallikrein-related peptidases](#) . J Biol Chem 284: 32989-32994.
http://www.jbc.org/site/thematics/proteolytic_enzymes/
13. Pampalakis G, Diamandis EP, Katsaros D, **Sotiropoulou G**.(2010) [Down-regulation of Dicer mRNA in ovarian cancer tissues provides a new potential biomarker.](#)
Clin Biochem 43: 324-327
14. Pampalakis G, Diamandis EP, Katsaros D, **Sotiropoulou G**. (2009) [Down-regulation of Dicer expression in ovarian cancer tissues.](#)
Clin. Biochem. 2009 Sep 24. [Epub ahead of print]
15. Pampalakis G, Prosnikli E, Agalioti T, Vlahou A, Zoumpourlis V, **Sotiropoulou G**. (2009) [A tumor protective role for human kallikrein-related peptidase 6 in breast cancer mediated by inhibition of epithelial-to-mesenchymal transition.](#)
Cancer Res. 69: 3779-3787.
16. **Sotiropoulou G**, Pampalakis G, Lianidou ES, Mourelatos Z. (2009) [Emerging roles of microRNAs as molecular switches in the integrated circuit of the cancer cell.](#)
RNA 15: 1443-1461.
17. Kioulafa M, Balkouranidou I, **Sotiropoulou G**, Kaklamanis L, Mavroudis D, Georgoulas V, Lianidou ES. (2009) [Methylation of cystatin M promoter in breast cancer is associated with unfavorable prognosis.](#)
Int. J. Cancer, in press
18. **Sotiropoulou G** , Sommerhoff CP. (2008) [Highlight on advances in proteolysis research.](#) Biol. Chem. 389: 967-969.
19. Pampalakis G, Scorilas A, **Sotiropoulou G**. (2008) [Novel splice variants of prostate-specific antigen and applications in diagnosis of prostate cancer](#)
. Clin. Biochem. 41: 591-597
20. Pampalakis G, Arampatzidou M, Amoutzias G, Kossida S, **Sotiropoulou G**. (2007) [Identification and analysis of mammalian KLK6 orthologue genes for prediction of physiological substrates](#)
. Comput. Biol. Chem. 1776: 22-31

21. Borgoño CA, Gavigan JA, Alves J, Bowles B, Harris JL, **Sotiropoulou G**, Diamandis EP (2007) [Definin g the extended substrate specificity of kallikrein 1-related peptidases](#) . Biol. Chem. 388: 1215-1225.
22. Pampalakis G, **Sotiropoulou G**. (2007) [Tissue kallikrein proteolytic cascade pathways in normal physiology and cancer](#) . BBA Reviews on Cancer 1776: 22-31.
23. Borgoño C, Michael IP, Komatsu N, Jayakumar A, Kapadia R, Clayman GL, **Sotiropoulou G**, Blaber M, Diamandis EP. (2007) [A potential role for multiple tissue kallikrein serine proteases in epidermal desquamation : Regulation by lympho-epithelial Kazal-type inhibitor and digestion of desmoglein 1](#). J. Biol. Chem. 282: 3640-3652.
24. Shaw JLV, Grass L, **Sotiropoulou G**, Diamandis EP. (2006) [Development of an immunofluorometric assay for human kallikrein 15 \(KLK15\) and identification of KLK15 in tissues and biological fluids](#) . Clin. Biochem. 40: 104-110.
25. Borgoño C, Michael IP, Komatsu N, Jayakumar A, Kapadia R, Clayman GL, **Sotiropoulou G**, Blaber M, Diamandis EP. (2006) [A potential role for multiple tissue kallikrein serine proteases in epidermal desquamation: Regulation by lympho-epithelial Kazal-type inhibitor and digestion of desmoglein 1](#). Journal of Biological Chemistry Dec 11 [Epub ahead of print]
26. Shaw JLV, Grass L, **Sotiropoulou G**, Diamandis EP. (2006) Development of an immunofluorometric assay for human kallikrein 15 (KLK15) and identification of KLK15 in tissues and biological fluids. Clinical Biochemistry 40: 104-110. Epub 2006 Aug 25
27. Pampalakis G, Diamandis EP and Sotiropoulou G. (2006) [The epigenetic basis for the aberrant expression of kallikreins in human cancers](#). Biological Chemistry, 387: 795-799.
28. Michael IP, Pampalakis G, Mikolajczyk SD, Malm J, Sotiropoulou G, Diamandis EP. (2006) [Involvement of human kallikrein 5 \(hK5\) in proteolytic cascade pathway culminating in seminal plasma liquefaction and prostate cancer progression](#). Journal of Biological Chemistry 281: 12743-12750.
29. Lundwall Å, Band V, Blaber M, Clements J, Courty Y, Diamandis EP, Fritz H, Lilja H, Malm J, Maltais LJ, Olsson AY, Petraki C, Scorilas A, Sotiropoulou G, Stenman U-H, Stephan C, Talieri M, Yousef GM. (2006) [A comprehensive nomenclature for serine proteases with homology to the tissue kallikrein](#). Biological Chemistry, 387: 637-641.

30. Pampalakis G, Sotiropoulou G. (2006) [Multiple mechanisms underlie the aberrant expression of the human kallikrein 6 gene in breast cancer.](#) Biological Chemistry, 387: 773-782.
31. Sidiropoulos M, Pampalakis G, Sotiropoulou G, Katsaros D, Diamandis EP (2005) [Down-Regulation of human kallikrein 10 \(KLK10/NES1\) by CpG island hypermethylation in breast, ovarian and prostate cancers.](#) Tumor Biology 26: 324-336.
32. Obiezu CV, Shan SJ, Soosaipillai A, Luo LY, Grass L, Sotiropoulou G, Petraki CD, Papanastasiou PA, Levesque MA, Diamandis EP. (2005) Human kallikrein 4: quantitative study in tissues and evidence for its secretion into biological fluids. Clinical Chemistry 51: 1432-1442.
33. Michael IP, Sotiropoulou G, Pampalakis G, Magklara A, Ghosh M, Wasney G, Diamandis EP. (2005) [Biochemical and enzymatic characterization of human kallikrein 5 \(hK5\), a novel serine protease potentially involved in cancer progression.](#) Journal of Biological Chemistry 280: 14628-14635.
34. Ghosh MC, Grass L, Soosaipillai A, Sotiropoulou G, Diamandis EP. (2004) Human kallikrein 6 degrades extracellular matrix proteins and may enhance the metastatic potential of tumour cells. Tumour Biology 25: 193-199.
35. Pampalakis G, Kurlender L, Diamandis EP, Sotiropoulou G. (2004) [Cloning and characterization of novel isoforms of the human kallikrein 6 gene.](#) Biochemical and Biophysical Research Communications 320: 54-61.
36. Bayés A, Tsetsenis T, Ventura S, Avilés FX, Vendrell J, Sotiropoulou G. (2004) [Human kallikrein 6 activity is regulated via an autoproteolytic mechanism of activation/inactivation.](#) Biological Chemistry 385: 517-524.
37. Ghosh MC, Grass L, Soosaipillai A, Sotiropoulou G, Diamandis EP. (2004) Human kallikrein 6 degrades extracellular matrix proteins and may enhance the metastatic potential of tumour cells. Tumour Biology 25: 193-199.
38. Shridhar R, Zhang J, Song J, Booth BA, Kevil CG, Sotiropoulou G, Sloane BF, Keppler D. (2004) [Cystatin M suppresses the malignant phenotype of human MDA-MB-435S cells.](#) Oncogene 23: 2206-2215.
39. Magklara A, Mellati AA, Wasney GA, Little SP, Sotiropoulou G, Becker GW, Diamandis EP. (2003) Characterization of the enzymatic activity of human kallikrein 6: Autoactivation, substrate specificity, and regulation by inhibitors. Biochem Biophys Res Commun 307: 948-955.
40. Sotiropoulou G, Rogakos V, Tsetsenis T, Pampalakis G, Zafeiropoulos N, Simillides G, Yiotakis A, Diamandis EP. (2003) [Emerging interest in the kallikrein gene family for understanding and diagnosing cancer.](#) Oncology Research 13: 381-391.
41. Kapadia C, Chang A, Sotiropoulou G, Yousef GM, Grass L, Soosaipillai A, Xing X,

Howarth DHC, Diamandis EP. (2003) [Human kallikrein 13: Production and purification of recombinant protein, monoclonal and polyclonal antibodies and development of a sensitive and specific immunofluorometric assay.](#) Clinical Chemistry 49:77-86.

42. Gomis-Rüth FX, Bayés A, Sotiropoulou G, Pampalakis G, Tsetsenis T, Vigellas V, Avilés FX, and Coll M. (2002) [The structure of prozyme unveils a novel activation mechanism for the human kallikrein family.](#) The Journal of Biological Chemistry 277: 27273-27281.

43. Lin R, Nagai Y, Sladek R, Bastien Y, Ho J, Petrecca K, Sotiropoulou G, Diamandis EP, Hudson TJ, White JH. (2002) [Expression profiling in squamous carcinoma cells reveals pleiotropic effects of vitamin D3 analog EB1089 signalling on cell proliferation, differentiation, and immune system regulation.](#) Molecular Endocrinology 16: 1243-1256.

44. Sotiropoulou G, Kono M, Anisowicz A, Stenman G, Tsuji S, Sager R. (2002) [Identification and functional characterization of a human GalNAc a2,6-sialyltransferase with altered expression in breast cancer.](#) Molecular Medicine 8: 42-55.

45. Zeeuwen PL, Van Vlijmen-Willems IM, Jansen BJ, Sotiropoulou G, Curfs JH, Meis JF, Janssen JJ, Van Ruissen F, Schalkwijk J. (2001) [Cystatin M/E expression is restricted to differentiated epidermal keratinocytes and sweat glands: a new skin-specific proteinase inhibitor that is a target for cross-linking by transglutaminase.](#) Journal of Investigative Dermatology 116: 693-701.

46. Diamandis EP, Yousef GM, Soosaipillai AR, Grass L, Porter A, Little S, Sotiropoulou G. (2000) [Immunofluorometric assay of human kallikrein 6 \(zyme/protease M/neurosin\) and preliminary clinical applications.](#) Clinical Biochemistry 33: 369-375.

47. Dionyssopoulou H, Mouzaki A, Sloodstra J, Puijk W, Meloen R, Cordopatis P, Sotiropoulou G. (2000) [Synthetic peptides as putative therapeutic agents in transplantation medicine: application of PEPSCAN to the identification of functional sequences in the extracellular domain of the interleukin-2 receptor beta chain \(IL-2Rbeta\).](#) Journal of Immunological Methods 241: 83-95.

48. Yousef GM, Luo LY, Scherer SW, Sotiropoulou G, Diamandis EP. (1999) [Molecular characterization of zyme/protease M/neurosin, a hormonally-regulated kallikrein-like serine protease.](#) Ge nomics 62: 251-259.

49. Anisowicz A, Sotiropoulou G, Sager R. (1999) Re-expression of the SPR1 gene in breast carcinomas by phorbol 12-myristate 13-acetate or UV irradiation is mediated by the AP-1 binding site in the SPR1 promoter. Molecular Medicine 5: 526-541.

50. Sotiropoulou G, Anisowicz A, Sager R. (1997) [Identification, cloning and characterization of cystatin M, a novel cysteine proteinase inhibitor, down-regulated in breast cancer.](#) Journal of Biological Chemistry 272: 903-910.

51. Stenman G, Astrom AK, Roijer E, Sotiropoulou G, Zhang M, Sager R. (1997) Assignment of a novel cysteine proteinase inhibitor (CST6) to 11q13 by fluorescence in situ hybridization. *Cytogenetics and Cell Genetics* 76: 45-46.
52. Anisowicz A, Sotiropoulou G, Stenman G, Mok SC, Sager R. (1996) A novel protease homolog differentially expressed in breast and ovarian cancer. *Molecular Medicine* 2: 624-636.
53. Sotiropoulou G, Anisowicz A, Ryan K, Sager R. (1995) Isolation of a novel protease inhibitor involved in breast cancer and senescence». *International Journal of Oncology Suppl.* 7: 969.
54. Sager R, Sheng S, Anisowicz A, Sotiropoulou G, Zou Z, Swisshelm K, Hendrix M, Thor A, Ryan K, Rafidi K, Seftor E. (1994) RNA genetics of breast cancer: maspin as a paradigm. *Cold Spring Harbor Symposia of Quantitative Biology* 59: 537-546.
55. Sager R, Anisowicz A, Neveu M, Liang P, Sotiropoulou G. (1993) [Identification by differential display of alpha 6 integrin as a candidate tumor suppressor gene.](#) *FASEB Journal* 7: 964-970.

PATENTS

1. Anisowicz A, Sager R, Sotiropoulou G. (1998) "Human protease M, a novel serine protease, and its cDNA sequence and diagnostic and therapeutic uses". PCT Int. Patent, WO 98/11238, 1-92.
2. Sotiropoulou G, Anisowicz A, Sager R. (1997) "Human cystatin M cDNA sequence, recombinant vector, gene regulation in tumor, and cancer diagnosis and therapy". PCT Int. Patent, WO 97/14797, 1-67.

[SUBMISSIONS TO INTERNATIONAL DATABASE](#)

ΥΠΟΔΟΧΗ ΦΟΙΤΗΤΩΝ/ΤΡΙΩΝ

Ώρες γραφείου: Τρίτη 9:30-11:00 π.μ
Τετάρτη 10:30-13:30 π.μ

LINKS

- International Proteolysis Society www.protease.org
- The Kallikrein Society www.kallikrein-society.org

- American Association for Cancer Research www.aacr.org
- Women in Cancer Research www.wicr.org
- Hellenic Proteomics Society www.hellenicproteomicssociety.gr

PHOTO GALLERY

- [Research](#)
- [Meetings and other](#)

OFFICE HOURS FOR STUDENTS

Monday 11:30-13:30

Thursday 11:00-12:00