

## PROUSIS C. KYRIAKOS

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Research: [Synthetic Medicinal Chemistry and Chemical Biology](#)



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### Education

**2009:** PhD in Organic Chemistry – National Technical University of Athens (NTUA), School of Chemical Engineering. Supervisor: Prof. Olga Igglessi-Markopoulou

Thesis: 'Design and Synthesis of Bioactive Heterocyclic Compounds in Solid and Solution Phase: Application in Natural Products Synthesis.'

**2002:** B. Sc. Chemistry, Department of Chemistry, National and Kapodistrian University of Athens, Athens, Greece.

### Appointments

**2022 – Today:** Senior Researcher at the Institute of Chemical Biology of the National Hellenic Research Foundation, Athens (ICB-NHRF)

**2018 – 2022:** Associate Researcher at the Institute of Chemical Biology of the National Hellenic Research Foundation, Athens (ICB-NHRF)

**7/2013 – 04/2018:** Postdoctoral researcher, Institute of Biology, Medicinal Chemistry and Biotechnology, National Hellenic Research Foundation (IBMCB-NHRF).

**9/2011 – 5/2013:** Postdoctoral researcher, Institute of Biology, Medicinal Chemistry and Biotechnology, National Hellenic Research Foundation (IBMCB-NHRF).

**3/2011 – 7/2011:** Postdoctoral researcher, Mediterranean Agronomic Institute of Chania, Crete.

**2/2009 – 12/2010 and 2/2010 – 1/2011:** Postdoctoral researcher, Institute of Organic and Pharmaceutical Chemistry, National Hellenic Research Foundation (IOPC-NHRF).

**1/2009 – 8/2009:** Postdoctoral researcher, Laboratory of Organic Chemistry, School of Chemical Engineering, National Technical University of Athens – NTUA.

### Fellowships / Awards

**2010 – 2011:** Post-doctoral Scholarship by the State Scholarships Foundation.

**2003 – 2006:** Doctoral Scholarship-Prize by the A. G. Leventis Foundation, France, Laboratory of Organic Chemistry, School of Chemical Engineering, national Technical University of Athens – NTUA

**2006 – 2008:** Doctoral Scholarship-Prize by the Research Committee, Laboratory of Organic Chemistry, School of Chemical Engineering, national Technical University of Athens – NTUA.

### Current Research Interests

- Design and synthesis of NIR-fluorescent dyes and probes for bio-imaging applications including cancer theranostics.
- Design and synthesis of novel neuroprotective and neuroregenerative neurosteroid analogues mimicking neurotrophin activity.
- Design and synthesis of ether phospholipids with antiprotozoal activity (anti-Leishmanial activity, against *T. Brucei* and *T. Cruzi*).
- Design and synthesis of heterocyclic compounds with potential pharmacological profile (Inflammatory and Antibacterial activity)

### Teaching Experience

**2003 – 2008:** Teaching of the Laboratory Course 'Nuclear Magnetic Resonance-NMR', 2<sup>nd</sup> year undergraduate students, School of Chemical Engineering, national Technical University of Athens – NTUA.

**2003 – 2008:** Teaching and training of 2<sup>nd</sup> year undergraduate students, Course of "Organic Chemistry I". School of Chemical Engineering, national Technical University of Athens – NTUA.

**2003 – 2004:** Teaching and training of 2<sup>nd</sup> year undergraduate students, Course of "Organic Chemistry II". School of Chemical Engineering, national Technical University of Athens – NTUA.

**2006:** Teaching and of Postgraduate Students, MSc Programme 'Materials, Science and Technology', Course of Nuclear Magnetic Resonance –NMR, School of Chemical Engineering, national Technical University of Athens – NTUA.

**2013:** Invited lecturer for teaching the course of Organic Chemistry, Mediterranean Agronomic Institute of Chania, Grete.

### Member of Advisory Committee of PhD Theses

**2018:** Olga Kirkilessi – **ongoing** (supervisor: Dr T. Calogeropoulou)

**2018:** Alessia Ladorrata – **ongoing** (in the context of EuroNeurotrophin, supervisor: Dr T. Calogeropoulou)

**2018:** Daniele Narducci – **ongoing** (in the context of EuroNeurotrophin, supervisor: Dr T. Calogeropoulou)

### **Organizing Committee membership**

**2012:** Member of the organizing committee, COST CM0801 4<sup>th</sup> Annual Meeting, Kolymvari Greece.

### **Participation in National Funded Research Projects**

- GSRT Infrastructures program, **Bioimaging–GR:** ‘A Greek Research Infrastructure for Visualizing and Monitoring Fundamental Biological Processes’ (Participating Researcher)

### **Participation in EU Funded Research Projects**

- **H2020-MSCA-ITN-2017, EuroNeurotrophin:** ‘A European training network for the discovery of neurotrophins small molecule mimetics as potential therapeutic agents for neurodegeneration and neuroinflammation’ GA: N<sup>o</sup> 765704 (Participating Researcher)

### **Current Collaborations**

#### **National**

**Res. Director T. Calogeropoulou**, IBMCB-NHRF

**Res. Director D. Papahatjis**, IBMCB-NHRF

**Res. Director M. Koufaki**, IBMCB-NHRF

**Prof. A. Gravanis**, Medical School, University of Crete - UOC

**Prof. A. Detsi**, Department of Chemical Engineering, National Technical University of Athens - NTUA

**Ass. Prof. Ioannis Charalampopoulos**, Foundation for Research and Technology Hellas - FORTH

**Ass. Res. A. Kaltzoglou**, TPCI-NHRF

#### **International**

**Prof. J. Z. Torres**, Department of Chemistry and Biochemistry, University of California Los Angeles - UCLA

**Prof. M.-P. Costi**, Pharmacy Department, University of Modena and Reggio Emilia, Italy

**Dr A. Cordeiro-da-Silva**, Instituto de Biologia Molecular e Celular, Porto, Portugal

**Prof. Dame Pamela Shaw**, University of Sheffield, Sheffield Institute for Translational Neuroscience, United Kingdom

**Prof. S. Mangani**, University of Siena, Italy

**Prof. Rebecca Wade**, HITS gGmbH, Molecular and Cellular Modeling Group, Germany

**Prof. Christophe Rochais**, Université de Caen Normandie, France

**Dr. Vasileia-Ismini Alexaki**, Technische Universität Dresden, Faculty of Medicine, Germany

**Dr. Marie-Ann Ewart**, AvantiCell Science Ltd., United Kingdom

**Ass. Prof. Ka Wan Li**, Stichting VU, Department of Molecular and Cellular Neurobiology, The Netherlands

### Collaborations with Companies

Novartis (Hellas) S.A.C.I., Greece

Accelopment AG, Switzerland

### Publications in Peer Reviewed Scientific Journals

1. "A Novel Access to 2-Amino Furanones via Cyclization of Functionalized  $\gamma$ -Hydroxy- $\alpha,\beta$ -butenoates Derived from *N*-Hydroxybenzotriazole Esters of  $\alpha$ -Hydroxy Acids" G. Athanasellis, A. Detsi, **K. Prousis**, O. Igglessi-Markopoulou, J. Markopoulos. *Synthesis* **2003**, 1, 2015-2022.
2. "Solid phase synthesis of substituted 2-aminopyrrolin-4-ones via the spontaneous postcleavage cyclization" A. Detsi, P. Emirtzoglou, **K. Prousis**, V. Skouridou, O. Igglessi-Markopoulou; *Synlett* **2004**, 2, 353-355.
3. "A Novel Traceless Solid Phase Approach to Functionalized Tetramic Acids and 2-Amino-4-pyrrolinones" **K. C. Prousis**, A. Detsi, O. Igglessi-Markopoulou; *Synlett* **2005**, 18, 2763.
4. "A novel synthetic approach to the thiotetronic ring system, the key intermediate for thiolactomycin analogues" S. Kikionis, **K. C. Prousis**, A. Detsi, O. Igglessi-Markopoulou; *ARKIVOC* **2006** (xii) 1-10.
5. "Design and Synthesis of Novel Quinolinone-3-aminocarboxamides and their  $\alpha$ -Lipoic Acid Adducts as Antioxidant and Antiinflammatory Agents." A. Detsi, D. Bouloumbasi, **K. C. Prousis**, M. koufaki, G. Athanasellis, G. Melagraki, A.

- Afantitis, O. Igglessi-Markopoulou, C. Kontogiorgis, D. Hadjipavlou-Litina; *J. Med. Chem.* 2007, 50, 2450-2458.
6. "Solid-Phase Synthesis of Optically Active Substituted 2-Aminofuranones Using an Activated Carbonate Linker" D. Matiadis, **K. C. Prousis**, O. Igglessi-Markopoulou; *Molecules* **2009**, 14(10), 3914-3921.
  7. "Efficient Efficient construction of functionalized 5-Carboxymethyl Tetramic Acids using N-Ac-L-aspartic Anhydride as Chiral Building Block" **K. C. Prousis**, J. Markopoulos, V. Mckee, O. Igglessi-Markopoulou; *Tetrahedron*, **2010**, 66, 3944-3950.
  8. "Design and synthesis of new adamantyl-substituted antileishmanial ether phospholipids." I. Papanastasiou, **K. C. Prousis**, K. Georgikopoulou, T. Pavlidis, E. Scoulica, N. Kolocouris, T. Calogeropoulou; *Bioorg. Med. Chem. Letters*, **2010**, 20(18), 5484 – 5487.
  9. "Synthesis and crystal structure characterization of zinc (II) tetronic acid complexes" **K. C. Prousis**, G. Athanasellis, V. Stefanou, D. Matiadis, E. Kokalari, O. Igglessi-Markopoulou, V. Mc Kee, J. Markopoulos; *Bioinorganic Chemistry and Applications*, **2010**, Art. ID 651652, 7 pages doi:10.1155/2010/651652.
  10. "Three step solid-phase synthesis of functionalized tetronic acids using an activated carbonate linker" D. Matiadis, **K. C. Prousis**, O. Igglessi-Markopoulou; *Synthetic Communications* **2013**, 43(3), 392-397.
  11. "Effect of alkylphospholipids on Candida albicans biofilm formation and maturation" T. V. M. Vila, K. Ishida, W. de Souza, **K. C. Prousis**, T. Calogeropoulou, S. Rozental; *J. Antimicrobial Chemotherapy* **2013**, 68(1) 113-125.
  12. "Reactivity of 2-methyl-4*H*-3,1-benzoxazin-4-ones and 2-methyl-4*H*-pyrido[2,3-d][1,3]oxazin-4-one under Microwave Irradiation Conditions" **K. C. Prousis**, A. Tzani, N. Avlonitis, T. Calogeropoulou, A. Detsi; *J. Het. Chem* **2013**, 50, 6, 1313-1321.
  13. "Steroidal Cardiac Na<sup>+</sup>/K<sup>+</sup> ATPase Inhibitors Exhibit Strong Anti-Cancer Potential in Vitro and in Prostate and Lung Cancer Xenografts in Vivo" K. Dimas, N. Papadopoulou, C. Baskakis, **K. C. Prousis**, M. Tsakos, S. Alkahtani, S. Honisch, F. Lang, T. Calogeropoulou, K. Alevizopoulos, C. Stournaras; *Anticancer Agents Med Chem* **2014**, 14(5), 762 – 770.

14. "FeCl<sub>3</sub>-catalysed ultrasonic-assisted, solvent-free synthesis of 4-substituted coumarins. A useful complement to the Pechmann reaction" **K. C. Prousis**, N. Avlonitis, G. A. Heropoulos, T. Calogeropoulou; *Ultrasonics Sonochemistry* **2014**, *21*, 3, 937 – 942.
15. "A steroidal Na<sup>+</sup>/K<sup>+</sup> ATPase inhibitor triggers pro-apoptotic signaling and induces apoptosis in prostate and lung tumor cells" S. Honisch, S. Alkahtani, K. Michalis, L. Guilai, A. Saud A., Al-V. Hamad, K. Dimas, A. Abdullah A., **K. C. Prousis**, Al-D. Bader, T. Calogeropoulou, K. Alevizopoulos, F. Lang, C. Stournaras; *Anticancer Agents Med. Chem.* **2014**, *14*(8), 1161 – 1168.
16. "Design and synthesis of 21-alkynylaryl pregnenolone derivatives and evaluation of their anticancer activity" G. Szalóki, A. Pantzou, **K. C. Prousis**, O. Mavrofydi, P. Papazafiri, T. Calogeropoulou; *Bioorg. & Med. Chem.* **2014**, *22*, 6980–6988.
17. "An efficient synthetic approach towards fully functionalized tetronic acids: the use of 1,3-dioxolane-2,4-diones as novel protected-activated synthons of  $\alpha$ -hydroxy acids" **K. C. Prousis**, John Markopoulos, Vickie Mckee, Olga Igglessi-Markopoulou; *Tetrahedron* **2015**, *66*, 8637-48.
18. "Identification of Novel Chemical Scaffolds Inhibiting Trypanothione Synthetase from Pathogenic Trypanosomatids" D. Benítez, A. Medeiros, L. Fiestas, E. A. P. Zenere, F. Maiwald, **K. C. Prousis**, M. Roussaki, T. Calogeropoulou, A. Detsi, T. Jaeger, J. Šarlauskas, L. P. Mašič, C. Kunick, G. R. Labadie, L. Flohé, M. A. Comini; *PLOS Neglected Tropical Diseases* **2016**, *10*(4): e0004617.
19. "Selective and differential interactions of BNN27, a novel C17-spiroepoxy steroid derivative, with TrkA receptors, regulating neuronal survival and differentiation" I. Pediaditakis, P. Efstathopoulos, **K. C. Prousis**, M. Zervou, J. C. Arévalo, V. I. Alexaki, V. Nikoletopoulou, E. Karagianni, C. Potamitis, N. Tavernarakis, T. Chavakis, A. N. Margioris, M. Venihaki, T. Calogeropoulou, I. Charalampopoulos, A. Gravanis; *Neuropharmacology* **2016**, *111*, 266–282.
20. "Functional characterization and anti-cancer action of the clinical phase II cardiac Na<sup>+</sup>/K<sup>+</sup> ATPase inhibitor istaroxime: in vitro and in vivo properties and cross talk with the membrane androgen receptor" K. Alevizopoulos, K. Dimas, N. Papadopoulou, E.-M. Schmidt, A. Tsapara, S. Alkahtani, S. Honisch, **K. C. Prousis**, S. Alarifi, T. Calogeropoulou, F. Lang, C. Stournaras; *Ongotarget* **2016**, *7*, 17, 24415 – 28.

21. "BNN27, a 17-Spiroepoxy steroid derivative, interacts with and activates p75 neurotrophin receptor, rescuing cerebellar granule neurons from apoptosis" I. Padiaditakis, A. Kourgiantaki, **K. C. Prousis**, C. Potamitis, K. P. Xanthopoulos, M. Zervou, T. Calogeropoulou, I. Charalampopoulos, A. Gravanis; *Front. Pharmacol.* **2016**, *7*, article 512, 1-14.
22. "Accelerating Drug Discovery Efforts for Trypanosomatidic Infections Using an Integrated Transnational Academic Drug Discovery Platform" C. B. Moraes, G. Witt, M. Kuzikov, B. Ellinger, T. Calogeropoulou, **K. C. Prousis**, S. Mangani, F. Di Pisa, G. Landi, L. D. Iacono, C. Pozzi, L. H. Freitas-Junior, B. S. Pascoalino, C. P. Bertolacini, B. Behrens, O. Keminer, J. Leu, M. Wolf, J. Reinshagen, A. Cordeiro-da-Silva, N. Santarem, A. Venturelli, S. Wrigley, D. Karunakaran, B. Kebede, I. Pöhner, W. Müller, J. Panecka-Hofman, R. C. Wade, M. Fenske, J. Clos, J. M. Alunda, M. Jesús Corral, E. Uliassi, M. L. Bolognesi, P. Linciano, A. Quotadamo, S. Ferrari, M. Santucci, C. Borsari, M.P. Costi, and S. Gul; *SLAS Discov.* **2019** *24(3)*, 346-361.
23. "New cationic heptamethinecyanine-graphene hybrid materials", **K.C. Prousis**, Ruben Canton-Vitoria, Georgia Pagona, Maria Goulielmaki, Vassilis Zoumpourlis, Nikos Tagmatarchis, Theodora Calogeropoulou, *Dyes and Pigments* **2020**, *175*, 108047, DOI: 10.1016/j.dyepig.2019.108047.
24. "Synthesis, biological evaluation and QSAR studies of new thieno[2,3-d]pyrimidin-4(3H)-one derivatives as antimicrobial and antifungal agents", G.E. Magoulas, L. Kalopetridou, A. Ćirić, E. Kritsi, P. Kouka, P. Zoumpoulakis, N. Chondrogianni, M. Sokovic, **K.C. Prousis**, T. Calogeropoulou, *Bioorg. Chem.* **2021**, *106*, 104509, DOI: 10.2174/1381612826666201210115340.
25. "Phospholipid analogues as chemotherapeutic agents against trypanosomatids", E. Chazapi, G.E. Magoulas, **K.C. Prousis**, T. Calogeropoulou, *Curr. Pharm. Des.* **2021**, *27*, *15*, 1790–1806, DOI: 10.2174/1381612826666201210115340
26. "Design, Synthesis and Antiparasitic Evaluation of Click Phospholipids", G.E. Magoulas, P. Afroudakis, K. Georgikopoulou, M. Roussaki, C. Borsari, T. Fotopoulou, N. Santarem, E. Barrias, P. T. Nevado, J. Hachenberg, E. Bifeld, B. Ellinger, M. Kuzikov, I. Fragiadaki, E. Scoulica, J. Clos, S. Gul, M.P. Costi, W. de Souza, **K.C. Prousis**, A. Cordeiro da Silva, T. Calogeropoulou, *Molecules* **2021**, *26(14)*, 4204, DOI: 10.3390/molecules26144204,

27. "A novel synthetic protocol for the synthesis of pulvinones, and naturally occurring Aspulvinone E, molecules of medicinal interest", **Prousis, K.C.\***, Katsamakas, S., Markopoulos, J., Igglessi-Markopoulou, O. *Synthetic Communications*, 2022, *52(1)*, 117 – 128, DOI: 10.1080/00397911.2021.2001662
28. "Development and biological characterization of a novel selective Trka agonist with neuroprotective properties against amyloid toxicity", Rogdakis T., Charou D., Latorrata A., Papadimitriou E., Tsengenesis A., Athanasiou C., Papadopoulou M., Chalikiopoulou C., Katsila T., Ramos I., Prousis K. C., Wade, R. C., Sidiropoulou, K., Calogeropoulou, T., Gravanis, A., Charalampopoulos, I., *Biomedicines*, **2022**, *10(3)*, 614, DOI: 10.3390/biomedicines10030614

### Patents

1. BIOINSPIRED PROTEASOME ACTIVATORS WITH ANTIAGING ACTIVITY", GR20180100094A, WO2019171088A1, Inventors: Koufaki M., Calogeropoulou T., Chondrogianni N., Papahatjis D., Gonos E., Fotopoulou T., **Prousis K. C.**, Chazapi E.
2. "COMPOUND FOR USE IN THE TREATMENT OF PROTOZOAL DISEASES AND PROCESS FOR PRODUCTION OF SAID COMPOUND". Greek Patent Application No. 20200100577, Inventors: Theodora Calogeropoulou, **Kyriakos C. Prousis**, Marina Roussaki, George Magoulas, Theano Fotopoulou.

### Oral Presentations

1. **Kyriakos C. Prousis**, Olga Igglessi-Markopoulou\*. "A Short Synthetic Approach on Substituted Tetramic Acids via N-Substituted aspartic acid anhydrides" 12<sup>th</sup> Hellenic Symposium on Pharmaceutical Chemistry, 27 – 28 January 2006, Patras, Greece.
2. **Kyriakos C. Prousis**, Ioannis Charalampopoulos, Achilleas Gravanis, Theodora Calogeropoulou. "New 17-Spiro-substituted Neurosteroid Derivatives with Antiapoptotic and Neurotrophic effects". Final Meeting of the 'Arcade' European project Athens, 21<sup>st</sup> of May 2013.
3. **Kyriakos C. Prousis**, Pantelis Afroudakis, P. Zoumpoulakis, M. Zervou, Theodora Calogeropoulou. "Synthesis of ether phospholipids and labeled derivatives". Consortium Meeting 2 in the context of European project NMTRypI (*New Medicines for Trypanosomatidic Infections*) 18<sup>th</sup> of September 2014.