



# CHRYSI TZOUGKRAKI

Professor Emeritus

LABORATORY OF ORGANIC CHEMISTRY, DEPARTMENT OF CHEMISTRY,  
NATIONAL AND KAPODISTRIAN UNIVERSITY OF ATHENS

Email: [tzougkaki@chem.uoa.gr](mailto:tzougkaki@chem.uoa.gr)

ORCID: 000-0002-5660-6592

Google scholar:

[https://scholar.google.com/scholar?hl=en&as\\_sdt=0%2C5&q=Tzougkaki%40chem.uoa.gr&oq=tzougkaki](https://scholar.google.com/scholar?hl=en&as_sdt=0%2C5&q=Tzougkaki%40chem.uoa.gr&oq=tzougkaki)

(Citations: 2007, h-index: 17)

SCOPUS: 6602138165

Tel.: 6972856557

Website:

[https://www.chem.uoa.gr/dioikisi\\_prosopiko/prosopiko\\_tmimatos/omotimoi\\_kathigites/tzougkaki\\_chrysa/](https://www.chem.uoa.gr/dioikisi_prosopiko/prosopiko_tmimatos/omotimoi_kathigites/tzougkaki_chrysa/)

## EDUCATION

- Bachelor: Chemistry Department, National and Kapodistrian University of Athens, 1968
- PhD: Chemistry Department, National and Kapodistrian University of Athens, 1976. [Glu(OMe)<sup>4</sup>] – Oxytocin. Synthesis of an Analog of the Natural Hormone.
- Postdoctoral: Hoffmann La Roche Research Laboratories (director Professor Meienhofer, (1976-1978)
- Attending courses (as postdoc) at Stanford University in California, for the Autumn Quarter of the academic year 1978-1979
- Visiting Research Fellow at the Max-Planck Institut für Biochemie (August 1983-February 1984).

## RESEARCH FIELDS

Bioorganic Chemistry and Teaching of Chemistry.

Research in Chemistry Teaching is focused on the development, implementation and evaluation of:

- new teaching approaches
- the chemistry problem-solving strategies used by students
- tools for investigating students' learning and conceptual change
- tools for investigating students' knowledge, skills, interests, and attitudes
- tools for studying the effects of chemical representations on the students' understanding of chemical concepts and their ability to solve problems
- development of new technology educational material (software, videos, etc.) for teaching Chemistry.

## UNDERGRADUATE COURSES

Compulsory courses, Chemistry Department, National and Kapodistrian University of Athens

- **Organic Chemistry I** (1981-1985). **Organic Chemistry II** (1985-1986). **Organic Chemistry III** (1986-1987) και (1991-1992). **Organic Chemistry IV** (1992-1995)
- **Bioorganic Chemistry**, selective course, Department of Chemistry, National and Kapodistrian University of Athens (1996-2012).

## GRADUATE COURSES

Graduate course	Graduate Program	Department	University
<i>Special Topics and Experiments in Organic Chemistry and Biochemistry</i> (1998-σήμερα)	Chemistry Education and New Educational Technologies - Education for Sustainable Development	Chemistry	NKUA
<i>Synthesis of Compounds with Biological Activity</i> (1994-2005)	Organic Chemistry	Chemistry	NKUA
<i>Chemistry of natural products I</i> (1998-2001)	Isolation and Synthesis of Natural Products with Biological activity	Chemistry	University of Crete
<i>Research methodology</i> (1998-20011)	Isolation and Synthesis of Natural Products with Biological activity	Chemistry	University of Crete
<i>Synthesis of Biomolecules and Agrochemicals</i> (2003-2006)	Organic Synthesis and Applications in Chemical Industry	Chemistry	NKUA
<i>Laboratory Experiment in Chemistry Teaching</i> (2005-σήμερα)	Chemistry Education and New Educational Technologies - Education for Sustainable Development	Chemistry	NKUA

## SCHOLARSHIPS

- Two-year fellowship from the "Roche Institute of Molecular Biology", (1976-1978) for post-doctoral research in United States of America
- Six months fellowship from the "Max-Planck-Gesellschaft" for research work at Max-Plank-Institute, Germany, (August 1983-February 1984).

## RESEARCH GRANTS

### Participation in 16 funded programs, in 11 of which was the principal investigator (P.I.) and coordinator in 2

- Organization and Running the Interinstitutional Graduate Program "Chemistry Education and New Educational Technologies (ChEd-ICT), Ministry of education, (1998-2004)
- "Training in Chemistry of Secondary Education professors", Ministry of education, (2000-2001)
- "Training in Physics of Secondary Education professors", Ministry of education, (1999-2000)
- "Synthesis and Study of New Fluorescent Substrates for the Determination of Various Proteases
- GSRT, (1991-1992)
- "Publication of the Chemistry Department's Educational and Research Activity Guide in Greek and English, National Mortgage Bank of Greece, 1996
- Research program of Sector II of the Department of Chemistry, ELKE, NKUA, (1992-1993)
- Radiolabelled bioactive molecules in diagnosis and therapy, GSRT, (2003-2006)
- Science Teachers Training Across Europe: Establishing a pathway for a common science teacher training framework (Program Socrates), (2002-2004)
- Creation and Pilot Operation of the Constantly Upgrading Station for Technological Studies, (in Chemistry Department NKUA), Ministry of Education, (1997-2000)
- "Development of supportive e-material for the lesson of Chemistry in high school", Pedagogical

Institute, (2003-2005)

- "Pleiades: Development of Educational Software and Integrated Educational Packages for Greek Schools of Primary and Secondary Education & Educational Software Products in Schools - Nereides: Development of Integrated Educational Packages. Carbon B", Research Academic Institute of Computer Technology, (2006-2007)
- "Pleiades: Development of Educational Software and Integrated Educational Packages for Greek Schools of Primary and Secondary Education & Educational Software Products in Schools - Nereides: Development of Integrated Educational Packages. Chemical calculations B", Research Academic Institute of Computer Technology, (2006-2007)
- «Visuospatial abilities of students and understanding - learning of concepts related to the molecular structure. Design, development and evaluation of molecular visualization and augmented reality software for secondary and higher education», Ministry of education, (2011-2015)
- Eight research programs were funded by ELKE, NKUA, yearly, from 1997-2003, 2005-2007, and 2008-2009.

## REVIEWER OF SCIENTIFIC JOURNALS

Journals relative to Education of Chemistry: *Journal of Chemical Education*, *Chemistry Education Research and Practice (CERP)*, *Chemical Educator*, κ.α.

## EDITOR OF BOOKS AND SPECIAL VOLUMES

1. "Topics in Bioorganic Chemistry" (in Greek), C. Tzougraki, G. Kokotos, Athens 1993, 5<sup>th</sup> edition 2003.
2. "Development of new methods for fluorometric assays of enzymes", C. Tzougraki, in the book Matsoukas J., Mavromoustakos, T. (Eds.), Biomedical and Health Research, Vol. 55, Drug Discovery and Design: Medical Aspects, IOS Press, Amsterdam (2002).
3. "The Magic World of Chemistry", Chemistry Educational Software, developed for the Pedagogical Institute of Greece (2004, in Greek, with co-authors).
4. Educational Chemistry Packages for High School Students a) "Carbon", b) "Chemical Calculations", developed for the Research Academic Computer Technology Institute (2007, in Greek, with co-authors).
5. Six Teaching Lecture Notes for graduate students

## PATENTS

## ADDITIONAL INFORMATION

- Presentations at conferences: **84**
- Supervision of doctoral theses: **9**
- Supervision of graduate students: **24**
- Supervision of undergraduate students: **15**
- PI in Research Programs: **11**
- Collaboration/Participation in Research Programs: **17**
- Reviewer in Research Programs: Evaluator in **YPEPTH, IKY, HFRI**
- Member of thematic program evaluation committees, **EPEAEK**.

## SELECTED PUBLICATIONS (link OF PUBLICATIONS)

50 peer-reviewed publications in international journals and periodical publications

Selected recent publications

1. "Attitudes toward Chemistry among Eleventh Grade Students in High Schools in Greece", K. Salta, **C. Tzougraki**, *Science Education*, **88**(4), 535 (2004). <https://doi.org/10.1002/sce.10134>
2. "Design and Development of a Bilingual Multimedia Educational Tool for Teaching Chemistry Concepts to Deaf Students in Greek Sign Language", M. Panselina, M. Sigalas, **C. Tzougraki**, *Education and Information Technologies*, **7**, 225 (2002). DOI:org/10.1023/A:1020807530212
3. "Conceptual versus Algorithmic Problem-solving: Focusing on Problems dealing with Conservation of Matter in Chemistry", K. Salta, **C. Tzougraki**, *Research in Science Education*, **41** (4), 587-609, 2011. <https://doi.org/10.1007/s11165-010-9181-6>
4. "Exploring Novel Tools for Assessing High School Students' Meaningful Understanding of Organic Reactions", T. Vachliotis, K. Salta, P. Vasiliou, **C. Tzougraki**, *Journal of Chemical Education*, **88** (3), 337-345, 2011. DOI: [10.1021/ed9000415](https://doi.org/10.1021/ed9000415)
5. "Development and Application of Suitable Criteria for the Evaluation of Chemical Representations in School Textbooks", V. Gkitzia, K. Salta, **C. Tzougraki**, *Chemical Education Research and Practice*, **12** (1), 5-14, 2011. DOI: [10.1039/C1RP90003J](https://doi.org/10.1039/C1RP90003J)
6. "Meaningful Understanding and Systems Thinking in Organic K Chemistry: Validating Measurement and Exploring Relationships", T. Vachliotis, K. Salta, & **C. Tzougraki**, *Research in Science Education*, **44** (2), 239-266, 2014. DOI: [10.1007/s11165-013-9382-x](https://doi.org/10.1007/s11165-013-9382-x)
7. "Development and Evaluation of a Systemic Assessment Framework in Organic Chemistry" **Tzougraki, C.**, Salta, K., & Vachliotis, T. *African Journal of Chemical Education*, **4** (2), Special Issue (Part I), 101-121, 2014.
8. "Changes in Visual/Spatial and Analytic Strategy Use in Organic Chemistry with the Development of Expertise" M. Vlacholia, S. Vosniadou, P. Roussos, K.Salta, S. Kazi, M. Sigalas and **C. Tzougraki**. *Chem. Educ. Res. Pract.*, **18**, 763-773, 2017. DOI: <https://doi.org/10.1039/C7RP00036G>
9. "Students' competence in translating between different types of chemical representations", V. Gkitzia, K. Salta and **C. Tzougraki**, *Chem. Educ. Res. Pract.*, **21**, 307-330, 2020. DOI: [10.1039/C8RP00301G](https://doi.org/10.1039/C8RP00301G)
10. "Developing Basic Systems Thinking Skills for Deeper Understanding of Chemistry Concepts in High School Students", T. Vachliotis, K. Salta, & **C. Tzougraki**, *Thinking Skills and Creativity* **41**(3):100881, DOI: [10.1016/j.tsc.2021.100881](https://doi.org/10.1016/j.tsc.2021.100881)