

CV - BIOSKETCH FOR PAPADOPOULOU LEFKOTHEA



PERSONAL INFORMATION	
SURNAME	PAPADOPOULOU
NAME	LEFKOTHEA
e-mail	LEFKOTEA@PHARM.AUTH.GR
TEL.	6948594935
CURRENT POSITION(S)	
2022-today	Professor School of Pharmacy, Aristotle University of Thessaloniki, Thessaloniki, Greece
PREVIOUS POSITION(S)	
2012-2022	Associate Professor School of Pharmacy, Aristotle University of Thessaloniki, Thessaloniki, Greece
2004-2012	Assistant Professor School of Pharmacy, Aristotle University of Thessaloniki, Thessaloniki, Greece
1993-2004	Lecturer School of Pharmacy, Aristotle University of Thessaloniki, Thessaloniki, Greece
1982-1993	Research Fellow School of Pharmacy, Aristotle University of Thessaloniki, Thessaloniki, Greece
EDUCATION	
1996-1998	Post Doc Research Fellow Department of Neurology, College of Physicians and Surgeons, Columbia University in the City of New York, U.S.A.
1986-1991	Ph.D Thesis "Analysis of Anthracyclines-Hemoproteins Interactions in the Hemopoietic System" Lab. of Pharmacology, School of Pharmacy, Aristotle University of Thessaloniki, Thessaloniki, Greece
1976-1980	Degree in Pharmacy School of Pharmacy, Aristotle University of Thessaloniki, Thessaloniki, Greece
PUBLICATIONS	
<ul style="list-style-type: none">• Targeting mitochondrial bioenergetics by combination treatment with Imatinib and Dichloroacetate in human erythroleukemic K-562 and colorectal HCT-116 cancer cells. Kakafika MG*, Lyta AA*, Gavriilidis	

GI, Tsiftoglou SA, Miliotou AN, Pappas IS, Vizirianakis IS, **Papadopoulou LC****, Tsiftoglou AS**. **Accepted for publication** in *International Journal of Oncology*.

- [Synthesis and biological evaluation of ^{99m}Tc-tricarbonyl complexes of C-3 carboxy derivatives of fluoroquinolones in infection and tumor animal models.](#) Tzovas G, Papadimitriou N, Angelakou E, Bompola G, Miliotou AN, Kakafika MG, **Papadopoulou LC**, Iakovou I, Gabriel C, Dimosthenis Sarigiannis D, Papagiannopoulou D. *Inorganica Chimica Acta*, *IN PRESS*.
- [Conventional and Innovative Molecular Approaches Developed for Treating Hemoglobinopathies.](#) Miliotou AN, Georgiou-Siafis SK, Vlachaki E, Pappas IS, Vizirianakis IS, Tsiftoglou AS, **Papadopoulou LC** Reference Module in Biomedical Sciences, Elsevier, 2024, ISBN 9780128012383, <https://doi.org/10.1016/B978-0-443-15717-2.00025-1>.
(<https://www.sciencedirect.com/science/article/pii/B9780443157172000251>) INVITED CHAPTER REVIEW
- [Recruiting In Vitro Transcribed mRNA against Cancer Immunotherapy: A Contemporary Appraisal of the Current Landscape.](#) Miliotou AN, Georgiou-Siafis SK, Ntenti C, Pappas IS, **Papadopoulou LC**. *Curr Issues Mol Biol*. 2023 Nov 16;45(11):9181-9214. doi: 10.3390/cimb45110576. INVITED REVIEW
- [Protein Transduction Domain-Mediated Delivery of Recombinant Proteins and In Vitro Transcribed mRNAs for Protein Replacement Therapy of Human Severe Genetic Mitochondrial Disorders: The Case of Sco2 Deficiency.](#) Miliotou AN, Foltopoulou PF, Ingendoh-Tsakmakidis A, Tsiftoglou AS, Vizirianakis IS, Pappas IS, **Papadopoulou LC**. *Pharmaceutics*. 2023 Jan 14;15(1):286. doi: 10.3390/pharmaceutics15010286. INVITED REVIEW
- [An Innovative PTD-IVT-mRNA Delivery Platform for CAR Immunotherapy of ErbB\(+\) Solid Tumor Neoplastic Cells.](#) Georgiou-Siafis SK, Miliotou AN, Ntenti C, Pappas IS, **Papadopoulou LC**. *Biomedicines*. 2022 Nov 10;10(11):2885. doi: 10.3390/biomedicines10112885
- [In Vitro-Transcribed mRNAs as a new generation of therapeutics in the dawn of 21st century: Exploitation of peptides as carriers for their intracellular delivery.](#) Miliotou A.N. Pappas I.S., Vizirianakis I.S. and **Papadopoulou L.C.** *In*: Stefan Jurga and Jan Barciszewski (eds) *Messenger RNA Therapeutics, RNA TECHNOLOGIES*, Springer Series, vol 13, 209-235, **2022**. DOI: 10.1007/978-3-031-08415-7_10. INVITED CHAPTER REVIEW
- [Development of a novel PTD-mediated IVT-mRNA delivery platform for potential protein replacement therapy of metabolic/genetic disorders.](#) Miliotou AN, Pappas IS, Spyroulias G, Vlachaki E, Tsiftoglou AS, Vizirianakis IS, **Papadopoulou LC**. *Mol Ther Nucleic Acids*. Sep 20; 26:694-710, **2021**. doi: 10.1016/j.omtn.2021.09.008.
- [PTD-mediated delivery of \$\alpha\$ -globin chain into K-562 erythroleukemia cells and \$\alpha\$ -thalassemic \(HBH\) patients' RBCs ex vivo in the frame of Protein Replacement Therapy.](#) Miliotou AN, Papagiannopoulou D, Vlachaki E, Samiotaki M, Laspa D, Theodoridou S, Tsiftoglou AS, **Papadopoulou LC**. *J Biol Res (Thessalon)*. Jul 20; 28(1):16, **2021**. doi: 10.1186/s40709-021-00148-3.
- [In vivo biodistribution study of TAT-L-Sco2 fusion protein, developed as protein therapeutic for mitochondrial disorders attributed to SCO2 mutations.](#) Kaiafas GC, Papagiannopoulou D, Miliotou AN, Tsingotjidou AS, Chalkidou PC, Tsika AC, Spyroulias GA, Tsiftoglou AS, **Papadopoulou LC**. *Mol Genet Metab Rep*. Dec 8; 25:100683, **2020**. doi: 10.1016/j.ymgmr.2020.100683.
- [In Vitro-Transcribed \(IVT\)-mRNA CAR Therapy Development.](#) Miliotou AN, **Papadopoulou LC**. *Methods Mol Biol.*; 2086:87-117, **2020**. doi: 10.1007/978-1-0716-0146-4_20. INVITED CHAPTER REVIEW

- Tackling pharmacological response heterogeneity by PBPK modeling to advance precision medicine productivity of nanotechnology and genomics therapeutics. Vizirianakis IS, Miliotou, A.N., Mystridis GA, Andriotis, EG, Andreadis I, **Papadopoulou LC**, Fatouros DG. Expert Review of Precision Medicine and Drug Development 4(3), 139-151, **2019**. (INVITED review to Assoc. Prof. I.S. Vizirianakis).
- [Organometallic rhenium tricarbonyl-enrofloxacin and -levofloxacin complexes: synthesis, albumin-binding, DNA-interaction and cell viability studies.](#) Pagoni CC, Xylouri VS, Kaiafas GC, Lazou M, Bompola G, Tsoukas E, **Papadopoulou LC**, Psomas G, Papagiannopoulou D. J Biol Inorg Chem. Aug; 24(5):609-619, **2019**. doi: 10.1007/s00775-019-01666-1.
- [Production and Transduction of a Human Recombinant \$\beta\$ -Globin Chain into Proerythroid K-562 Cells To Replace Missing Endogenous \$\beta\$ -Globin.](#) **Papadopoulou LC**, Ingendoh-Tsakmakidis A, Mpoutourelis CN, Tzikalou LD, Spyridou ED, Gavriilidis GI, Kaiafas GC, Ntaska AT, Vlachaki E, Panayotou G, Samiotaki M, Tsiftoglou AS. Mol Pharm. Dec 3; 15(12):5665-5677, **2018**. doi: 10.1021/acs.molpharmaceut.8b00857.
- [CAR T-cell Therapy: A New Era in Cancer Immunotherapy.](#) Miliotou AN, **Papadopoulou LC**. Curr Pharm Biotechnol.;19(1):5-18, **2018**. doi: 10.2174/1389201019666180418095526.
INVITED REVIEW
- [Synthesis, characterization and biological evaluation of \(99m\)Tc/Re-tricarbonyl quinolone complexes.](#) Kydonaki TE, Tsoukas E, Mendes F, Hatzidimitriou AG, Paulo A, **Papadopoulou LC**, Papagiannopoulou D, Psomas G. J Inorg Biochem. Jul; 160:94-105, **2016**. doi: 10.1016/j.jinorgbio.2015.12.010.
- [Imatinib inhibits the expression of SCO2 and FRAXIN genes that encode mitochondrial proteins in human Bcr-Abl⁺ leukemia cells.](#) **Papadopoulou LC**, Kyriazou AV, Bonovolias ID, Tsiftoglou AS. Blood Cells Mol Dis. Jun-Aug; 53(1-2):84-90, **2014**. doi: 10.1016/j.bcmd.2014.03.001
- [The potential role of cell penetrating peptides in the intracellular delivery of proteins for therapy of erythroid related disorders.](#) **Papadopoulou LC**, Tsiftoglou AS. Pharmaceuticals (Basel). Jan 7; 6(1):32-53, **2013**. doi: 10.3390/ph6010032. INVITED REVIEW / Concept Paper
- [Transduction of human recombinant proteins into mitochondria as a protein therapeutic approach for mitochondrial disorders.](#) **Papadopoulou LC**, Tsiftoglou AS. Pharm Res. Nov; 28 (11):2639-56, **2011**. doi: 10.1007/s11095-011-0546-y. INVITED / EXPERT REVIEW
- [Intracellular delivery of full-length recombinant human mitochondrial L-Sco2 protein into the mitochondria of permanent cell lines and SCO2 deficient patient's primary cells.](#) Foltopoulou PF, Tsiftoglou AS, Bonovolias ID, Ingendoh AT, **Papadopoulou LC**. Biochim Biophys Acta. Jun; 1802(6):497-508, **2010**. doi: 10.1016/j.bbadis.2010.02.009.
- [Heme as key regulator of major mammalian cellular functions: molecular, cellular, and pharmacological aspects.](#) Tsiftoglou AS, Tsamadou AI, **Papadopoulou LC**. Pharmacol Ther. Aug;111(2):327-45, **2006**. doi: 10.1016/j.pharmthera.2005.10.017. INVITED REVIEW to Prof. A.S. Tsiftoglou.
- [Human recombinant mutated forms of the mitochondrial COX assembly Sco2 protein differ from wild-type in physical state and copper binding capacity.](#) Foltopoulou PF, Zachariadis GA, Politou AS, Tsiftoglou AS, **Papadopoulou LC**. Mol Genet Metab. Mar; 81(3):225-36, **2004**. doi: 10.1016/j.ymgme.2003.11.006.

- [Differences in nuclear gene expression between cells containing monomer and dimer mitochondrial genomes.](#) Clark KM, Brown TA, Davidson MM, **Papadopoulou LC**, Clayton DA. *Gene*. Mar 6; 286(1):91-104, **2002**. doi: 10.1016/s0378-1119(01)00805-8.
- [Differential features of patients with mutations in two COX assembly genes, SURF-1 and SCO2.](#) Sue CM, Karadimas C, Checcarelli N, Tanji K, **Papadopoulou LC**, Pallotti F, Guo FL, Shanske S, Hirano M, De Vivo DC, Van Coster R, Kaplan P, Bonilla E, DiMauro S. *Ann Neurol*. May; 47(5):589-95, **2000**. PMID: 10805329
- [Fatal infantile cardioencephalomyopathy with COX deficiency and mutations in SCO2, a COX assembly gene.](#) **Papadopoulou LC**, Sue CM, Davidson MM, Tanji K, Nishino I, Sadlock JE, Krishna S, Walker W, Selby J, Glerum DM, Coster RV, Lyon G, Scalais E, Lebel R, Kaplan P, Shanske S, De Vivo DC, Bonilla E, Hirano M, DiMauro S, Schon EA. *Nat Genet*. Nov; 23(3):333-7, **1999**. doi: 10.1038/15513.
- [Structural and functional impairment of mitochondria in adriamycin-induced cardiomyopathy in mice: suppression of cytochrome c oxidase II gene expression.](#) **Papadopoulou LC**, Theophilidis G, Thomopoulos GN, Tsiftoglou AS. *Biochem Pharmacol*. Mar 1; 57(5):481-9, **1999**. doi: 10.1016/s0006-2952(98)00305-0.
- [The fate of human sperm-derived mtDNA in somatic cells.](#) Manfredi G, Thyagarajan D, **Papadopoulou LC**, Pallotti F, Schon EA. *Am J Hum Genet*. Oct; 61(4):953-60, **1997**. doi: 10.1086/514887.
- [Effects of hemin on apoptosis, suppression of cytochrome c oxidase gene expression, and bone-marrow toxicity induced by doxorubicin \(adriamycin\).](#) **Papadopoulou LC**, Tsiftoglou AS. *Biochem Pharmacol*. Sep 13; 52(5):713-22, **1996**. doi: 10.1016/0006-2952(96)00349-8.
- [Mitochondrial cytochrome c oxidase as a target site for daunomycin in K-562 cells and heart tissue.](#) **Papadopoulou LC**, Tsiftoglou AS. *Cancer Res*. Mar 1; 53(5):1072-8, **1993**. PMID: 8382552

Citations: > 2200 (google scholar), index: **h: 16, i10: 19**

Google scholar: [link](#)

Pubmed search results: [link](#)

Orcid: [0000-0002-5738-969x](#)

Website: [link](#)

MAIN SCIENTIFIC INTERESTS

- Molecular mechanisms of action of anthracyclines on bone marrow and myocardium
- Mitochondrial genetics and neurodegenerative disorders.
- Cloning and expression of cox assembly genes as well as purification and characterization of their protein products being involved in mitochondrial copper pathway.
- Tat-mediated protein transduction into mammalian cells, as an alternative therapeutic approach for monogenetic disorders.
- Cellular bioenergetics
- Radiolabeling of recombinant proteins – biodistribution in mice
- Biological evaluation of fluoroquinolones' derivatives
- IVT-mRNA therapeutics
- Cancer car-NK cell immunotherapy
- PTD-IVT-mRNA therapeutics (patented methodology)

MEMBERSHIPS & REVIEWING ACTIVITIES

MEMBER of:

- Hellenic Society of Biochemistry and Molecular Biology

- Mitochondria Research Society
- Greek Society of Pharmacology
- Hellenic Society of Gene Therapy and Regenerative Medicine

REVIEWER for:

MDPI Pharmaceutics / Cancers / Biomolecules; Cellular Immunotherapy; Biomolecules; Cellular Immunology; Advanced Science; Molecular Pharmaceutics; Journal of Drug Research and Development, Sci Forschen Inc., USA; Journal of Biological Research-Thessaloniki

TEACHING ACTIVITIES

UNDERGRADUATE STUDIES

School of Pharmacy, A.U.Th, Greece

- 1999-2020 Toxicology
- 1999-2020 Clinical Pharmacology & Therapeutics
- 2015-2018 Pharmacology II
- 2015-2018 Pharmaceutical Biotechnology
- 2018-2020 Pharmacology I

GRADUATE STUDIES

School of Pharmacy, A.U.Th, Greece

PHARMACOLOGY & THERAPEUTICS / BIOTECHNOLOGY - MOLECULAR DIAGNOSTICS

- 2004-2018 Bioinformatics
- 2004-2018 Pharmaceutical Biotechnology II
- 2016-2017 Pharmaceutical Biotechnology I
- 2015-2020 DIRECTOR**

INDUSTRIAL PHARMACY

2019-today involvement in Teaching

School of Medicine - School of Pharmacy, A.U.Th, Greece

PRECISION MEDICINE – TRANSLATIONAL RESEARCH AND THERAPEUTICS

2020-today Innovative Treatments - Regulatory Framework (**course coordinator**)

Participation in GRADUATE STUDIES-TEACHING, in Greece

2016-today "BIOMEDICAL AND MOLECULAR SCIENCES IN DIAGNOSIS AND TREATMENT OF DISEASES", which is coordinated of the School of Medicine at the Democritus University of Thrace in collaboration with the Department of Biomedical Sciences of the International University of Greece.

P.I.: Prof. T. Lialiaris

2018-today "TOXICOLOGY", Department of Biochemistry and Biotechnology, University of Thessaly. P.I.: Prof. D. Kouretas

SUPERVISION OF GRADUATE STUDENTS & POSTDOCTORAL FELLOWS

2017 -2020: 1 PhD [Miliotou Androulla, School of Pharmacy, A.U.Th, Greece

"Development of *in vitro* transcribed mRNAs as Therapeutics for Metabolic/Monogenic Disorders, using the PTD Technology for their Intracellular Delivery".

2001 -2007: 1 PhD, Foltopoulou Parthena, School of Pharmacy, A.U.Th, Greece

"Role of mitochondrial proteins in the pathophysiology and therapeutics of degenerative diseases"

Participation in 7-Member Examining PhD Committees for PhD			
Ten (10)			
Supervision of graduate students (master thesis)			
2004-today Twenty (20) , plus four (4) in progress			
Supervision of undergraduate students			
2012 - today > 25			
FELLOWSHIPS AND AWARDS			
2014-2015	EXCELLENCE in TEACHING , Faculty of Health Sciences, AUTH		
2022	EXCELLENCE in INNOVATION , Faculty of Health Sciences, AUTH, for: REMARKABLE CLINICAL-LABORATORY WORK AND APPLICATION OF INNOVATIVE METHODS AND TECHNIQUES FOR THE FIRST TIME IN GREECE		
RESEARCH GRANTS OF RELATED PROJECTS			
Project Title	Funding source	Submission date	Role of the PI
Development of a novel approach of CAR technology towards immunotherapy of oral cancer	<i>Operational Programme «Human Resources Development, Education and Lifelong Learning 2014- 2020» (MIS 5070970)</i>	2020-2022	Papadopoulou Lefkothea: Academic Advisor
Development of <i>in vitro</i> transcribed mRNAs as therapeutics for metabolic/monogenic disorders, using the PTD technology for their intracellular delivery	ELIDEK (Code 1533)	2017-2020	Papadopoulou Lefkothea: Inventor of the methodology - Supervisor of Androulla N. Miliotou

GRANT APPLICATIONS OF RELATED PROJECTS			
Project Title	Funding source	Submission date	Role of Papadopoulou Lefkothea
CAR-NK genetically modified cells as immunotherapy for Erbb (+) solid tumors, via an innovative platform delivering in vitro transcribed mRNAs.	3 rd Call - H.F.R.I. 's Research Projects to support faculty members & researchers	15-1-2024	Principal Investigator
PTD-IVT-mRNA mediated Protein Replacement Therapy for two human genetic disorders, β -Thalassemia and Friedreich Ataxia	Sub-action 2. Funding Projects in Leading-Edge Sectors – RRFQ: Basic Research Financing(Horizontal support for all Sciences)	2022	Principal Investigator
Development of a SARS-CoV-2 mRNA-vaccine via a novel PTD-IVT-mRNA technology	4 th Call - H.F.R.I. Science & Society "Interventions to address the economic and	2021	Principal Investigator

	social consequences of the COVID-19 pandemic"		
Development of a CAR immunotherapy approach against melanoma via the production of innovative <i>in vitro</i> transcribed mRNAs, deliverable through Protein Transduction Technology.	2 nd Call for H.F.R.I. Research Projects to support Faculty Members and Researchers	2020	Principal Investigator

PAPADOPOULOU LEFKOTHEA' SCIENTIFIC ACHIEVEMENTS

1. Granted patent

a) **Greek patent (No: 1010063)**: «***Method for the development of a delivery platform to produce deliverable PTD-IVT-mRNA therapeutics***» granted to our group till 2039 by the Industrial Property Organization (OBI)

Principal Inventor: **L. C. Papadopoulou**
 Co-inventors: **I. S. Pappas, A. N. Miliotou, I. S. Vizirianakis**
AUTH Research Committee - **UTH** Research Committee

b) An application to **the European Patent Office** (EP20823912.9) is pending authorization (11-6-2022).

c) The **procedure** describing the **unique chemical process** for producing PTD-IVT-mRNAs is the subject of an **international patent application** with publication number **WO2021/094792A1** (20-5-2021).

2. Identification of a gene

IDENTIFICATION OF SCO2 GENE,

a nuclear gene encoding the mitochondrial Sco2, a COX assembly protein

Papadopoulou LC, Sue CM, Davidson MM, Tanji K, Nishino I, Sadlock JE, Krishna S, Walker W, Selby J, Glerum DM, Coster RV, Lyon G, Scalais E, Lebel R, Kaplan P, Shanske S, De Vivo DC, Bonilla E, Hirano M, DiMauro S, **Schon EA. (1999)** Fatal infantile cardioencephalomyopathy with COX deficiency and mutations in *SCO2*, a COX assembly gene. ***Nature Genetics***, Nov;23(3):333-7.

Nucleotide: GenBank Accession number: [AF177385.1](https://www.ncbi.nlm.nih.gov/nuccore/AF177385.1)
Protein: GenBank Accession number: [AAF05313.1](https://www.ncbi.nlm.nih.gov/protein/AAF05313.1)
OMIM: [#604377](https://www.ncbi.nlm.nih.gov/omim/604377)

3. Invited presentations to international conferences and/or advanced schools

- On behalf of the Organizing and Scientific Committees of **the 6^t Congress of the Hellenic Society of Gene Therapy and Regenerative Medicine**, Evangelia Yannaki, President of the Organizing Committee and the Society and **Achilleas Anagnostopoulos**, President of the Scientific Committee invited me on **Athens, Greece (Cotsen Hall, American School of Classic Studies)**, on **May 26-28, 2023**: [mRNA Therapeutics: Development of a Novel PTD-mediated IVT-mRNA Delivery Platform](#)

- On behalf of the **Scientific Committee of the World Mitochondria Society (WMS)**, Prof. **V. Weissig, President of WMS** and Prof. **M. Edeas, Chairman and Founder of WMS**, to the **13th Targeting Mitochondria World Congress**, which will be organized in **Berlin** on **October 26-28, 2022** : [A Novel PTD-mediated IVT-mRNA delivery platform developed for Protein Replacement Therapy \(PRT\) for genetic/metabolic disorders: the case of human fatal infantile cardioencephalomyopathy attributed to SCO2 mutations](#)
- Invitation by Robert Miller, PhD, VP Scientific Affairs, **Medicine Innovates series** (Ottawa, ON K2E 8A5, CANADA) (<https://medicineinnovates.com/>) by identifying our paper: "*Development of a novel PTD-mediated IVT-mRNA delivery platform for potential protein replacement therapy of metabolic/genetic disorders*" as a **key scientific article** contributing to **research excellence**: <https://medicineinnovates.com/ptd-mediated-ivt-mrna-delivery-platform-potential-protein-replacement-therapy-metabolic-genetic-disorders/>