

Curriculum Vitae

Karolos-Fivos Borbolis MSc, PhD

Nationality: Greek

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EDUCATION

PhD in Molecular Biology of Aging [2017]

Department of Biology, National and Kapodistrian University of Athens, Greece

Grade: Excellent (unanimously)

MSc in Molecular Medicine [2012]

Departments of Medicine, Biology and Nursery, National and Kapodistrian University of Athens, Greece

Grade: Excellent (9,51/10 - Honors)

BSc in Biology [2009]

Department of Biology, National and Kapodistrian University of Athens, Greece

Grade: Very good (6,52/10)

Certificate of Biosciences Teaching and Bioethics [06/2009]

Departments of Biology and Education, National and Kapodistrian University of Athens, Greece

Grade: Excellent

CURRENT POSITION

Assistant Professor [11/2025 - Present]

Section of Genetics, Cell & Developmental Biology, Department of Biology, University of Patras, Greece

RESEARCH EXPERIENCE

Post-doctoral Researcher [01/2024 - 08/2025]

Unit of Neurogenetics and Aging, Laboratory of Physiology, Medical School, National and Kapodistrian University of Athens, Greece

Description: Studying the mechanism of action of mitophagy inducers, mechanisms of neuronal mitophagy, the implication of DNA damage response pathways in neurodegenerative diseases and the role of lipid metabolism in the response to DNA damage using the nematode *C. elegans* as an experimental model.

Research Fellow [01/2022 - 12/2023]

Department of Biology, University of Padova, Italy

Description: Studying the action of chemical compounds with therapeutic potential in humanized models of the nematode *C. elegans* in collaboration with HealX Bioscience.

Post-doctoral Researcher [04/2017 - 31/12/2021]

Laboratory of Molecular Genetics of Aging, Biomedical Research Foundation of the Academy of Athens, Greece

Description: Using the nematode *C. elegans* to study the implication of mRNA decapping in the regulation of aging, innate immunity and neurodegeneration, the contribution of the Alternative Lengthening of Telomeres mechanism in aneuploidy-induced infertility and the role of Lon protease in aging and stress response.

PhD student [01/2013 - 03/2017]

Laboratory of Molecular Genetics of Aging, Biomedical Research Foundation of the Academy of Athens, Greece

Thesis title: The role of mRNA metabolism factors in the aging and physiology of the nematode *C. elegans* (ND code in National Archive of PhD theses: 40505).

Supervisors: Prof G. Diallinas/Dr P. Syntichaki

MSc student (thesis) [09/2011 – 10/2012]

Laboratory of Molecular Genetics of Aging, Biomedical Research Foundation of the Academy of Athens, Greece

Thesis title: Tissue specific analysis of the role of P-bodies in the aging of the nematode *C. elegans*.

Supervisors: Prof N. Anagnou/Dr P. Syntichaki

Undergraduate student (thesis) [10/2006 – 04/2009]

Laboratory of Fungal Molecular Genetics, Department of Biology, National and Kapodistrian University of Athens, Greece

Thesis title: Studying the role of uric and its intercellular redistribution in the physiology of *Aspergillus nidulans*.

Επιβλέπων: Prof G. Diallinas

PARTICIPATION IN RESEARCH GRANTS

Decoding mitochondrial selective autophagy in synaptic homeostasis during ageing [01/01/2024 – 31/08/2025]

Funding source: European Research Council (ERC)

Role: Post-doctoral researcher

Screening of drugs with therapeutic potential in *C. elegans* [01/01/2022 – 31/12/2023]

Funding source: HealX Bioscience

Role: Research Fellow

Lon protease in aging and cancer [03/2020 – 12/2021]

Funding source: Hellenic Foundation for Research and Innovation (HFRI)

Role: Post-doctoral researcher

Telomeric study of infertility in the nematode *C. elegans* [01/2020 - 12/2021]

Funding source: State Scholarships Foundation

Role: Post-doctoral researcher

A role for the decapping complex in the regulation of innate immunity response [03/2018 - 12/2021]

Funding source: Fondation Santé

Role: Post-doctoral researcher

The role of mRNA-processing bodies in ageing [06/2010 – 03/2017]

Funding source: European Research Council (ERC)

Role: MSc and PhD student

AWARDS AND DISTINCTIONS

Poster award [08/2025]

12th Aging Research and Drug Discovery Meeting (ARDD), Copenhagen, Denmark

Post-doctoral research scholarship [01/2020]

State Scholarships Foundation

Subject: Telomeric study of infertility in the nematode *C. elegans*

Founding of short-term scientific mission [12/2016]

COST

Subject: "Single molecule fluorescent in situ hybridization (smFISH) in decapping mutants"

Place: Imperial College of London, Ηνωμένο Βασίλειο

Participation in science lectures series of the Onasis Foundation [07/2012]

Onasis Foundation

Subject: "A world of RNAs"

Place: Foundation for Research and Technology, Heraklion, Crete, Greece

NETWORKS AND SUBSCRIPTIONS

Hellenic Society of Biochemistry and Molecular Biology (HSBMB) [2013 - Present]

Supporting member

SCIENTIFIC AND ACADEMIC ACTIVITIES

Editorial board member of Frontiers in Cell and Developmental Biology [2023 - Present]

Review editor (section Cell Death and Survival)

Ad hoc reviewer [2022 – Present]

Primary reviewer: STAR protocols, Cells, PloS One, Scientific Reports

Supporting reviewer: Methods in Cell Biology, Aging Cell, JoVE, Neuron, Frontiers in Cell and Developmental Biology, Nature Communications, Nature Aging, Expert Opinion on Drug Discovery, Advanced Science, Free Radical Biology and Medicine, Journal of Gerontology: Biological Sciences, Redox Biology

1^o ESN-ISN School "From Neurodegeneration to Neuronal Carcinogenesis: Mechanisms and Common Biologies" [2021]

Supporting supervisor of "Alternative animal models for diseases" section

7th Young Scientists Forum of HSBMB [2019]

Poster awards committee member

Highschool outreach activities "Biosciences: Open your mind – Change your world" [2015-2016]

Booth presenter for the subject "The nematode *C. elegans* in biological research"

European Network FP7-NEURINOX – Ίδρυμα Ιατροβιολογικών Ερευνών της Ακαδημίας Αθηνών

1st Young Scientists Forum of HSBMB [2013]

Organizing committee member

LANGUAGE SKILLS

Greek

Native speaker

English

Level: C2

Certificate: Certificate of Proficiency in English, Michigan Language Assessment (Honors)

French

Level: C2

Certificate: Diplôme De Langue Et Littérature Françaises (2e Degré), Université de Paris-Sorbonne (Paris IV)

COMPUTER SKILLS

Microsoft Office / Adobe Photoshop / Adobe Illustrator / ImageJ / GraphPad Prism / Internet, e-mail and Social Media

Certificate: UNICERT PRIMARY (modules Word Processing, Spreadsheets and Internet Services)

PUBLICATIONS OVERVIEW (Scopus)

Peer reviewed: 16

Book chapters: 2

Abstracts in conference proceedings: 32

Total citations number: 252

Non-self citations: 212

h index: 9

Total impact factor: 98,162

Average impact factor: 6,135

PUBLICATIONS LIST

PEER REVIEWED

***Urolithin A modulates inter-organellar communication via calcium-dependent mitophagy to promote healthy ageing* [2025]**

Roussos A*, Kitopoulou K*, Borbolis F, Ploumi C*, Giannou DD, Li Z, He H, Tsakiri E, Borland H, Kostakis IK, Samiotaki M, Trougakos IP., Bohr VA, Palikaras K

*Equal contribution

Original Research

https://www.tandfonline.com/doi/10.1080/15548627.2025.2561073?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%20pubmed

Autophagy. 2025 Dec;21(12):3097-3122 / DOI: 10.1080/15548627.2025.2561073. Epub 2025 Sep 29.

***Novel roles of DNA glycosylases in neurodegenerative diseases and aging* [2025]**

Tiwari V, Borbolis F, Croteau DL, Palikaras K, Bohr VA

Perspective article

https://journals.lww.com/nrronline/fulltext/2026/05000/novel_roles_of_dna_glycosylases_in.25.aspx

Neural Regen Res. 2026 May 1;21(5):1991-1992 / DOI: 10.4103/NRR.NRR-D-24-01588. Epub 2025 Apr 29.

***Calcium-mediated regulation of mitophagy: Implications in neurodegenerative diseases* [2024]**

Borbolis F, Ploumi C*, Palikaras K

* Equal contribution

Review article

<https://www.nature.com/articles/s44324-025-00049-2>

NPJ Metab Health Dis, 2025;3(1):4 / DOI: 10.1038/s44324-025-00049-2. Epub 2025 Feb 3.

***Loss of DNA glycosylases improves health and cognitive function in a *C. elegans* model of human tauopathy* [2024]**

Tiwari V, Buvarp E, Borbolis F, Puligilla C, Croteau DL, Palikaras K, Bohr VA

Original Research

<https://academic.oup.com/nar/article/52/18/10965/7734171?login=false>

Nucleic Acids Res., 2024 Aug 16:gkae705 / DOI: 10.1093/nar/gkae705

***MEC-12/alpha tubulin regulates mitochondrial distribution and mitophagy during oxidative stress in *C. elegans** [2024]**

Borbolis F, Kteniadaki M, Palikaras K

Original Research

<https://www.micropublication.org/journals/biology/micropub-biology-001232>

microPublication Biology / DOI: 10.17912/micropub.biology.001232

***Caenorhabditis elegans as a Model System to Study Human Neurodegenerative Disorders* [2023]**

Roussos A*, Kitopoulou K*, Borbolis F, Palikaras K

* Equal contribution

Review article

<https://www.mdpi.com/2218-273X/13/3/478>

Biomolecules. 2023 Mar 5;13(3):478 / DOI: 10.3390/biom13030478

Selective destabilization of transcripts by mRNA decapping regulates oocyte maturation and innate immunity gene expression during ageing in *C. elegans* [2023]

Borbolis F, Ranti D, Papadopoulou MD, Dimopoulou S, Malatras A, Michalopoulos I, Syntichaki P

Original Research

<https://www.mdpi.com/2079-7737/12/2/171>

Biology (Basel). 2023 Jan 21;12(2):171 / DOI: 10.3390/biology12020171

The Crosstalk between Microbiome and Mitochondrial Homeostasis in Neurodegeneration [2023]

Borbolis F*, Mytilinaiou E*, Palikaras K

* Equal contribution

Review article

<https://www.mdpi.com/2073-4409/12/3/429>

Cells. 2023 Jan 28;12(3):429 / DOI: 10.3390/cells12030429

The compartmentalized nature of neuronal mitophagy: molecular insights and implications [2022]

Borbolis F and Palikaras K

Review article

<https://www.cambridge.org/core/journals/expert-reviews-in-molecular-medicine/article/abs/compartmentalized-nature-of-neuronal-mitophagy-molecular-insights-and-implications/AC844759CDB5FC09F96432BE4C2C0F50>

Expert Reviews in Molecular Medicine, 2022 Sep 29:24:e38 / DOI: 10.1017/erm.2022.31

Organismal and Cellular Stress Responses upon Disruption of Mitochondrial Lonp1 Protease [2022]

Taouktsi E, Kyriakou E, Smyrniotis S, Borbolis F, Bondi L, Avgeris S, Trigazis S, Rigas S, Voutsinas GE, Syntichaki P

Original Research

<https://www.mdpi.com/2073-4409/11/8/1363>

Cells 2022; 11(8):1363 / DOI: 10.3390/cells11081363

Biological implications of decapping: beyond bulk mRNA decay [2021]

Borbolis F and Syntichaki P

Review article

<https://febs.onlinelibrary.wiley.com/doi/10.1111/febs.15798>

FEBS Journal 2021 / DOI: 10.1111/febs.15798

mRNA decapping is an evolutionarily conserved modulator of neuroendocrine signaling that controls development and ageing [2020]

Borbolis F, Rallis J, Kanatouris G, Kokla N, Karamalegkos A, Vasileiou C, Vakaloglou KM, Diallinas G, Stravopodis DJ, Zervas CG, Syntichaki P

Original Research

<https://elifesciences.org/articles/53757>

eLife 2020 Vol. 9 / DOI: 10.7554/eLife.53757

Neuronal function of the mRNA decapping complex determines survival of *Caenorhabditis elegans* at high temperature through temporal regulation of heterochronic gene expression [2017]

Borbolis F, Flessa C M, Roumelioti F, Diallinas G, Stravopodis D J, Syntichaki P

Original Research

<https://royalsocietypublishing.org/doi/10.1098/rsob.160313>

Open Biology 2017 Vol. 7(3) / DOI: 10.1098/rsob.160313

Cytoplasmic mRNA turnover and ageing [2015]

Borbolis F and Syntichaki P

Review article

<https://www.sciencedirect.com/science/article/pii/S0047637415300178?via%3Dihub>

Mechanisms of Ageing and Development 2015 Vol. 152 p. 32-42 / DOI: 10.1016/j.mad.2015.09.006

Diverse Functions of mRNA Metabolism Factors in Stress Defense and Aging of *Caenorhabditis elegans*

[2014]

Rousakis A, Vlanti A, Borbolis F, Roumelioti F, Kapetanou M, Syntichaki P

Original Research

<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0103365>

Plos One 2014 Vol. 9(7) p. e103365 / DOI: 10.1371/journal.pone.0103365

Purine utilization proteins in the Eurotiales: cellular compartmentalization, phylogenetic conservation and divergence [2014]

Galanopoulou K, Scazzocchio C, Galinou ME, Liu W, Borbolis F, Karachaliou M, Oestreicher N, Hatzinikolaou DG, Diallinas G, Amillis S

Original Research

<https://www.sciencedirect.com/science/article/abs/pii/S108718451400108X>

Fungal Genetics and Biology 2014 Vol. 69 p. 96-108 / DOI: 10.1016/j.fgb.2014.06.005

ΚΕΦΑΛΑΙΑ ΒΙΒΛΙΟΥ

Identifying therapeutic compounds for Autosomal Dominant Optic Atrophy (ADOA) through screening in the nematode *C. elegans* [2024]

Borbolis F and Palikaras K

Book chapter

<https://www.sciencedirect.com/science/article/pii/S0091679X24001419?via%3Dihub>

Methods Cell Biol. 2024:188:89-108 / DOI: 10.1016/bs.mcb.2024.04.004

mRNA granules and proteostasis in ageing and age-related diseases [2021]

Borbolis F and Syntichaki P

Book chapter

<https://www.routledge.com/Proteostasis-and-Proteolysis/Chondrogianni-Pick-Gioran/p/book/9780367499327>

Proteostasis and Proteolysis 2021 / ISBN 9780367499327

ABSTRACTS IN CONFERENCE PROCEEDINGS

Combined nicotinamide riboside and urolithin A treatment as a promising strategy to counteract ageing-related decline

12th Aging Research and Drug Discovery Meeting (ARDD), Copenhagen, Denmark [25/08/2025 – 29/08/2025]

Borbolis F, Tsakiri E, Kitopoulou K, Roussos A, Samiotaki M, Croteau DL, Bohr VA, Palikaras K

Poster

Urolithin A modulates inter-organellar communication via calcium-dependent mitophagy to promote healthy ageing

25th International Worm Meeting, Davis, CA, USA [28/06/2025 – 02/07/2025]

Kitopoulou A, Roussos A, Borbolis F, Ploumi C, He H, Samiotaki M, Palikaras K

Poster

Calcium signaling regulates mitophagy during ageing and stress conditions

European Worm Meeting, Utrecht, Netherlands [01/07/2024 – 03/07/2024]

Roussos A, Kitopoulou K, Borbolis F, Ploumi C, Palikaras K

Poster

A two-pronged approach to tackle ADOA using the nematode *C. elegans*

73rd National Congress of HSMBM, Athens, Greece [1/12/2023 - 3/12/2023]

Borbolis F, Palikaras K, Scorrano L

Oral presentation

The nematode *C. elegans* as a tool in the fight against neurodegeneration: the case of ADOA

7th National Congress “Molecular Medicine from laboratory to application – Challenges and questions”, Athens, Greece [22/06/2023 - 24/06/2023]

Borbolis F

Oral presentation

Inactivation of mitochondrial LONP1 protease elicits cytoprotective stress response mechanisms in *C. elegans*

FEBS 2022 Advanced Course/Redox Alterations and Cellular Responses: From Signalling to Interventions, Σπέτσες, Ελλάδα [15/09/2022 - 25/09/2022]

Taouktsi E, Kyriakou E, Borbolis F, Syntichaki P

Poster

Calcium homeostasis in the regulation of neuronal mitophagy

1st National Physiology Congress of the Hellenic Society of Physiology, Athens, Greece [15/04/2022 - 16/04/2022]

Borbolis F and Palikaras K

Poster

Homologous recombination competes with alternative DNA repair pathways to induce telomerase independent lengthening of telomeres in *C. elegans*

71st National Congress of HSBMB, Athens, Greece [26/11/2021 - 28/11/2021]

Borbolis F, Giatras K, Gagos S, Syntichaki P

Poster

A specialized role for mRNA decapping as a regulator of innate immunity gene expression during ageing in *C. elegans*

EMBO | EMBL Conference: Protein synthesis and translational control, Virtual [07/09/2021 - 10/09/2021]

Borbolis F, Ranti D, Papadopoulou M-D, Malatras A, Michalopoulos I, Syntichaki P

Poster

Disruption of LONP1 mitochondrial protease initiates a stress responsive cross talk between mitochondrial and cytoplasmic proteostatic mechanisms in *Caenorhabditis elegans* and human cancer cells

45th FEBS Congress, Virtual [03/07/2021 – 08/07/2021]

Taouktsi E, Kyriakou E, Borbolis F, Smyrniotis S, Bondi L, Avgeris S, Voutsinas GE, Syntichaki P

Poster

Activation of stress response mechanisms in a mitochondrial mutant of *C. elegans* ensures viability but fails to slow aging

Virtual Congress of HSBMB [08/04/2021]

Taouktsi E, Kyriakou E, Borbolis F, Syntichaki P

Oral presentation

Diverse effects of mitochondrial LON protease in the stress response of *Caenorhabditis elegans*

11th Targeting Mitochondria Conference, Virtual [28/10/2021 – 30/10/2021]

Taouktsi E, Kyriakou E, Borbolis F, Syntichaki P

Poster

mRNA decapping as a modulator of ageing and development

eLife Sciences Symposium: Aging, Geroscience and Longevity Special Issue, Virtual [04/12/2020]

Borbolis F, Rallis J, Zervas CG, Syntichaki P

Oral presentation

mRNA decapping is an evolutionarily conserved modulator of neuroendocrine signaling that controls lifespan

European Worm Meeting, Virtual [22/06/2020 – 23/06/2020]

Borbolis F, Zervas CG, Syntichaki P

Poster

Genetic crosstalk of mitochondrial LON protease and effectors of UPRmt in *Caenorhabditis elegans*

69th National Congress of HSBMB, Larissa, Greece [23/11/2018 – 25/11/2018]

Taouktsi E, Kyriakou E, Trigazis E, Borbolis F, Rigas S, Syntichaki P

Poster

Establishing a role of the mRNA decapping complex in the regulation of innate immune response in the nematode *Caenorhabditis elegans*

69th National Congress of HSBMB, Larissa, Greece [23/11/2018 – 25/11/2018]

Ranti D, Borbolis F, Papadopoulou MD, Malatras A, Michaelidis T, Michalopoulos I, Syntichaki P

Poster

Elucidating the functional relationship between neural activity of mRNA decapping complex and longevity in *Caenorhabditis elegans*

39th National Congress of HSBS, Lamia, Greece [25/05/2017 – 27/05/2017]

Karamalegos A, Borbolis F, Diallinas G, Syntichaki P

Poster

Tissue specific overexpression of mRNA degradation enzymes generates organismal responses to promote longevity

European Worm Meeting, Berlin, Germany [01/06/2016 – 03/06/2016]

Borbolis F, Kellaris G, Kokla L, Syntichaki P

Poster

Modulation of ageing by cytoplasmic mRNA turnover factors in *C. elegans*

66th National Congress of HSBMB, Athens, Greece [11/12/2015 – 13/12/2015]

Kellaris G, Borbolis F, Syntichaki P

Poster

Stress response and lifespan of transgenic worms that overexpress mRNA metabolism factors in specific tissues

37th National Congress of HSBS, Volos, Greece [21/05/2015 – 23/05/2015]

Kokla L, Borbolis F, Stravopodis D J, Syntichaki P

Poster

Tissue-specific alterations in decapping function have diverse effects on worm's physiology

Berlin C. elegans meeting, Berlin, Germany [01/06/2014 – 03/06/2014]

Borbolis F, Flessa M C, Syntichaki P

Poster

Distinct pattern and function of cytoplasmic RNA granule components in response to stress and aging in *Caenorhabditis elegans*

Berlin C. elegans meeting, Berlin, Germany [01/06/2014 – 03/06/2014]

Rousakis A, Vlanti A, Borbolis F, Syntichaki P

Poster

Study of P-Bodies in *C. elegans* reveals interplay between mRNA metabolism and multiple aspects of organismal physiology

1st Young Scientists Forum – HSBMB, Athens, Greece [05/12/2013]

Borbolis F, Roussakis R, Vlanti A, Roumelioti F, Flessa C M, Patera S, Syntichaki P

Poster

Analysis of P Bodies in *C. elegans* reveals their pivotal role in neuronal cells implicated in several aspects of organismal physiology

EEN – Neuroscience Days, Athens, Greece [02/11/2012 – 03/11/2012]

Borbolis F, Rousakis A, Vlanti A, Roumelioti F, Syntichaki P

Oral presentation

The role of mRNA metabolism factors in the lifespan and stress response of *Caenorhabditis elegans*

EMBO | EMBL Symposium: The complex life of mRNA, Heidelberg, Germany [07/10/2012 – 10/10/2012]

Vlanti A, Rousakis A, Borbolis F, Syntichaki P

Poster

Distinct roles of somatic RNA granule components in normal function and survival of *C. elegans*

EMBO Conference Series: C. elegans Neurobiology, Heidelberg, Germany [14/06/2012 – 17/06/2012]

Borbolis F, Rousakis A, Vlanti A, Roumelioti F, Syntichaki P

Poster

Distinct roles of somatic RNA granule components in normal function and survival of *C. elegans*

34th National Congress of HSBS, Trikala, Greece [17/05/2012 – 19/05/2012]

Rousakis A, Vlanti A, Borbolis F, Roumelioti F, Syntichaki P

Poster

mRNA metabolism and ageing in *C. elegans*

62nd National Congress of HSBMB, Athens, Greece [09/12/2011 - 11/12/2011]

Vlanti A, Rousakis A, Borbolis F, Syntichaki P

Poster

mRNA metabolism and ageing in *C. elegans*

33rd National Congress of HSBS, Edessa, Greece [19/05/2011 - 21/05/2011]

Rousakis A, Vlanti A, Borbolis F, Tsironi A, Syntichaki P

Poster

***In vivo* subcellular localization of purine catabolic enzymes in a model eukaryote**

31st National Congress of HSBS, Patras, Greece [14/05/2009 - 16/05/2009]

Galinou M E, Borbolis F, Gournas C, Diallinas G

Poster

A cryptic role of uric acid metabolism and intercellular redistribution in *Aspergillus nidulans* development

Eurofungbase Meeting, Sant Feliu de Guixols, Spain [22/10/2008 - 24/10/2008]

Borbolis F, Karachaliou M, Gournas C, Hatzinikolaou D, Pantazopoulou A, Diallinas G

Poster

A cryptic role of uric acid intercellular transport and catabolism in *Aspergillus nidulans* development

26th SMYTE, Braga, Portugal [06/09/2008 - 09/09/2008]

Borbolis F, Gournas C, Karachaliou M, Hatzinicolaou D, Pantazopoulou A, Diallinas G

Poster