Dimitrios - Georgios **Kontopoulos**

Walter Benjamin Postdoctoral Fellow (he/him)
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I am an integrative biologist. My research focuses on understanding **how diverse biological systems (from molecules to ecosystems) respond to environmental changes over various timescales**. I approach this goal using approaches from a wide range of fields, including ecoinformatics, phylogenetic comparative methods, comparative genomics, and molecular dynamics simulations.

Research appointments and internships

- **Walter Benjamin Postdoctoral Fellow at Prof. Noa Pinter-Wollman's group**, University of California, Los Angeles, USA. — **June 2025 - Present**
- **Postdoctoral researcher at Prof. Michael Hiller's group**, LOEWE Centre for Translational Biodiversity Genomics & Senckenberg Research Institute, Frankfurt am Main, Germany. — **May 2021 - Dec. 2024**
- **Visiting researcher**, Imperial College London, Silwood Park, Ascot, United Kingdom. — **Dec. 2019 - Apr. 2021**
- **Research assistant at Prof. Samraat Pawar's group**, Imperial College London, Silwood Park, Ascot, United Kingdom. — **Oct. 2015 - Sep. 2016**, **Nov. 2014 - May 2015**
- **Postgraduate intern at Dr. Sofia Kossida's group**, Bioinformatics and Medical Informatics Lab of the Biomedical Research Foundation of the Academy of Athens, Athens, Greece. — **Nov. 2012 - Sep. 2013**
- **Summer intern at Prof. Marie-Paule Lefranc's group**, Laboratoire d'ImmunoGénétique Moléculaire of the Institut de Génétique Humaine, Montpellier, France. — **May - June 2013**
- **Summer intern at Prof. Zissis Mamuris' group**, Laboratory of Genetics, Comparative and Evolutionary Biology of the Department of Biochemistry and Biotechnology of the University of Thessaly, Larissa, Greece. — **July 2011**
- **Intern at Dr. George Skavdis' group**, Laboratory of Molecular Regulation of the Department of Molecular Biology and Genetics of the Democritus University of Thrace, Alexandroupolis, Greece. — **Mar. - May 2010**

Education

- **Imperial College London**, Silwood Park, Ascot, United Kingdom — **Oct. 2015 - Dec. 2019**
  PhD: "Limits to thermal adaptation in ectotherms"
- **Imperial College London**, Silwood Park, Ascot, United Kingdom — **Sep. 2013 - Sep. 2014**
  MRes Biodiversity Informatics and Genomics, graduated with Distinction.
  Thesis: "Phylogenetic constraints and environmental drivers of thermal adaptation among the phytoplankton"
- **Democritus University of Thrace**, Alexandroupolis, Greece — **Sep. 2008 - Oct. 2012**
  BSc Molecular Biology and Genetics, graduated with 7.46/10 ("Very Well").
  Thesis: "Pinda: a gene duplication detection program"

Publications

Peer-reviewed papers († equal contribution; ✉ corresponding author)

19 Yi, X. ✉, **Kontopoulos, D.-G.**, & Hiller, M. ✉ (2025) Comprehensive phylogenetic reconstructions support ancestral omnivory in the ecologically diverse bat family Phyllostomidae. *Evolution*. *In press*. Preprint available from bioRxiv: doi:10.1101/2025.02.04.636560.

18 **Kontopoulos, D.-G.** ✉, Patmanidis, I., Barraclough, T.G., & Pawar, S. (2025) Changes in flexibility but not in compactness underlie the thermal adaptation of prokaryotic adenylate kinases. *Evolution Letters*. *In press*. Preprint available from bioRxiv: doi:10.1101/2024.09.04.611173.

17 Morales, A.E.[†], Dong, Y.[†], Brown, T., Baid, K., **Kontopoulos, D.-G.**, Gonzalez, V., Huang, Z., Ahmed, A.-W., Bhuinya, A., Hilgers, L., Winkler, S., Hughes, G., Li, X., Lu, P., Yang, Y., Kirilenko, B.M., Devanna, P., Lama, T.M., Nissan, Y., Pippel, M., Dávalos, L.M., Vernes, S.C., Puechmaille, S.J., Rossiter, S.J., Yovel, Y., Prescott, J.B., Kurth, A., Ray, D.A., Lim, B.K., Myers, E., Teeling, E.C., Banerjee, A., Irving, A.T. ✉, & Hiller, M. ✉ (2025) Bat genomes illuminate adaptations to viral tolerance and disease resistance. *Nature*. 638:449-458.

16 **Kontopoulos, D.-G.** ✉, Levesque, D.L., & Hiller, M. ✉ (2025) Numerous independent gains of daily torpor and hibernation across endotherms, linked with adaptation to diverse environments. *Functional Ecology*. 39(3):824-839.

15 **Kontopoulos, D.-G.** ✉, Sentis, A., Daufresne, M., Glazman, N., Dell, A.I., & Pawar, S. (2024) No universal mathematical model for thermal performance curves across traits and taxonomic groups. *Nature Communications*. 15:8855. **[Co-second place winner of the 2025 Outstanding Paper Award from the Early Career Ecologists Section of the Ecological Society of America]**

14 Pawar, S. ✉, Huxley, P.J. ✉, Smallwood, T.R.C., Nesbit, M.L., Chan, A.H.H., Shocket, M.S., Johnson, L.R., **Kontopoulos, D.-G.**, & Cator, L.J. ✉ (2024) Variation in temperature of peak trait performance constrains adaptation of arthropod populations to climatic warming. *Nature Ecology & Evolution*. 8:500-510.

13 Kirilenko, B.M., Munegowda, C., Osipova, E., Jebb, D., Sharma, V., Blumer, M., Morales, A.E., Ahmed, A.-W., **Kontopoulos, D.-G.**, Hilgers, L., Lindblad-Toh, K., Karlsson, E.K., Zoonomia Consortium, & Hiller, M. ✉ (2023) Integrating gene annotation with orthology inference at scale. *Science*. 380(6643):eabn3107.

12 Smith, T.P. ✉, Mombrikotb, S., Ransome, E., **Kontopoulos, D.-G.**, Pawar, S., & Bell, T. (2022) Latent functional diversity may accelerate microbial community responses to temperature fluctuations. *eLife*. 11:e80867.

11 Kordas, R.L., Pawar, S., **Kontopoulos, D.-G.**, Woodward, G., & O'Gorman, E.J. ✉ (2022) Metabolic plasticity can amplify ecosystem responses to global warming. *Nature Communications*. 13:2161.

10 **Kontopoulos, D.-G.** ✉, Smith, T.P., Barraclough, T.G., & Pawar, S. (2020) Adaptive evolution shapes the present-day distribution of the thermal sensitivity of population growth rate. *PLOS Biology*. 18(10):e3000894.

9 **Kontopoulos, D.-G.** ✉, van Sebille, E., Lange, M., Yvon-Durocher, G., Barraclough, T.G., & Pawar, S. (2020) Phytoplankton thermal responses adapt in the absence of hard thermodynamic constraints. *Evolution*. 74(4):775-790. **[Top cited article 2020-2021 in *Evolution*]**

8 García-Carreras, B. ✉, Sal, S., Padfield, D., **Kontopoulos, D.-G.**, Bestion, E., Schaum, C.-E., Yvon-Durocher, G., & Pawar, S. ✉ (2018) Role of carbon allocation efficiency in the temperature dependence of autotroph growth rates. *Proceedings of the National Academy of Sciences*. 115(31):E7361-E7368.

7 Kumbhar, R., Vidal-Eychenié, S., **Kontopoulos, D.-G.**, Larroque, M., Larroque, C., Basbous, J., Kossida, S., Ribeyre, C., & Constantinou, A. ✉ (2018) Recruitment of ubiquitin-activating enzyme UBA1 to DNA by poly(ADP-ribose) promotes ATR signalling. *Life Science Alliance*. 1(3):e201800096.

6 **Kontopoulos, D.-G.** ✉, García-Carreras, B., Sal, S., Smith, T.P., & Pawar, S. (2018) Use and misuse of temperature normalisation in meta-analyses of thermal responses of biological traits. *PeerJ*. 6:e4363.

5 **Kontopoulos, D.-G.** ✉, Kontopoulou, T., Ho, H.-C., & García-Carreras, B. (2017) Towards a theoretically informed policy against a rakghoul plague outbreak. *The Medical Journal of Australia*. 207(11):490-494. **[Third place in the 2017 Christmas Competition of the *Medical Journal of Australia*]**

4 **Kontopoulos, D.-G.** ✉, Vlachakis, D. ✉, Tsiliki, G., & Kossida, S. (2016) Structuprint: a scalable and extensible tool for two-dimensional representation of protein surfaces. *BMC Structural Biology*. 16:4.

3 Kontopoulou, T.[†] ✉, **Kontopoulos, D.-G.**[†], Vaidakis, E., & Mousoulis, G.P. (2015) Adult Kawasaki disease in a European patient: a case report and review of the literature. *Journal of Medical Case Reports*. 9(1):75.

2 Vlachakis, D., **Kontopoulos, D.-G.**, & Kossida, S. ✉ (2013) Space Constrained Homology Modelling: the paradigm of the RNA-dependent RNA polymerase of dengue (type II) virus. *Computational and Mathematical Methods in Medicine*. 2013:108910.

1 **Kontopoulos, D.-G.** & Glykos, N.M. ✉ (2013) Pinda: a web service for detection and analysis of intraspecies gene duplication events. *Computer Methods and Programs in Biomedicine*. 111(3):711-714.

Invited book chapters

1 **Kontopoulos, D.-G.** ✉ Phylogenetic comparative approaches for the study of biological scaling. In: Synthesizing biological scaling: towards a universal theory. Santa Fe Institute Press. *In press*.

Fellowships, scholarships, and awards

8	Outstanding Paper Award (co-second place winner) from the **Early Career Ecologists Section of the Ecological Society of America** for peer-reviewed paper #15 above.	**Aug. 2025**
7	Walter Benjamin Postdoctoral Fellowship from the **German Research Foundation (DFG)**. €126,937	**June 2025 - May 2027**
6	**EMBO** Postdoctoral Fellowship. €168,000	**Mar. 2022 - Apr. 2024**
5	Top cited article award from ***Evolution*** for peer-reviewed paper #9 above.	**Mar. 2022**
4	Third place in the Christmas Competition of the ***Medical Journal of Australia*** for peer-reviewed paper #5 above.	**Dec. 2017**
3	Travel award from the **Department of Life Sciences, Imperial College London** for attending the 2017 Congress of the European Society for Evolutionary Biology in Groningen, the Netherlands. £500	**May 2017**
2	Science and Solutions for a Changing Planet Doctoral Training Partnership scholarship from the **Natural Environment Research Council**. £57,300	**Oct. 2015 - Apr. 2019**
1	Scholarship for 2013-2014 postgraduate education abroad (1st cycle) from the **Greek State Scholarships Foundation (IKY)**. €16,290	**Dec. 2013**

Presentations

Invited talks

4 **Evolution of ecophysiological responses to temperature changes.** Université Clermont Auvergne, France, 10th November 2023.

3 **Deep-time evolution of biological responses to temperature changes.** Ecology & Evolution Seminar Series, Imperial College London, Silwood Park Campus, United Kingdom, 10th October 2019.

2 **Deep-time evolution of physiological responses to temperature changes.** Stanford University, CA, United States of America, 13th September 2019.

1 **Trait correlations vs environmental drivers in the evolution of phytoplankton thermal responses.** National Taiwan University, Taiwan, 26th March 2018.

Contributed talks

8 **Kontopoulos, D.-G.**, Ahmed, A.-W., Bein, B., & Hiller, M. (2024) The impact of phylogenetic diversity on the strength of gene-trait associations. *18th Conference of the Hellenic Society for Computational Biology and Bioinformatics, Lamia, Greece, 17-19th October*.

7 **Kontopoulos, D.-G.**, Levesque, D.L., & Hiller, M. (2023) Physiological, ecological, and genomic underpinnings of daily torpor and hibernation across mammals and birds. *2023 Annual Meeting of the Ecological Society of America, Portland, OR, United States of America, 6th-11th August*.

6 **Kontopoulos, D.-G.**, van Sebille, E., Lange, M., Yvon-Durocher, G., Barraclough, T.G., & Pawar, S. (2018) Non-random adaptive evolution of the thermal sensitivity of growth rate among phytoplankton. *Gordon Research Seminar on Unifying Ecology Across Scales, Biddeford, ME, United States of America, 21st-22nd July*.

5 **Kontopoulos, D.-G.**, van Sebille, E., Lange, M., Yvon-Durocher, G., & Pawar, S. (2018) Trait correlations vs environmental drivers in the evolution of phytoplankton thermal responses. *65th Annual Meeting of the Ecological Society of Japan, Sapporo, Japan, 14th-18th March*.

4 **Kontopoulos, D.-G.**, Yvon-Durocher G., & Pawar, S. (2017) Niche convergence in the macroevolution of the thermal sensitivity of phytoplankton growth rate. *2017 Congress of the European Society for Evolutionary Biology, Groningen, the Netherlands, 20th-25th August*.

3 **Kontopoulos, D.-G.**, Yvon-Durocher, G., & Pawar, S. (2016) Deep-time macroevolution of thermal sensitivity of growth rate among phytoplankton. *Annual Meeting of the British Ecological Society, Liverpool, United Kingdom, 11th-14th December*.

2 **Kontopoulos, D.-G.**, Yvon-Durocher, G., Chen, B., Thomas, M. K. & Pawar S. (2014) Γενικά μοτίβα θερμικής προσαρμογής μεταξύ των ειδών του φυτοπλαγκτού [General patterns of thermal adaptation among phytoplankton]. *7th National Congress of the Hellenic Ecological Society, Mytilene, Greece, 9th-12th October*.

1 **Kontopoulos, D.-G.** & Glykos, N.M. (2012) Pinda: a web service for detection and analysis of intraspecies gene duplications. *7th Conference of the Hellenic Society for Computational Biology and Bioinformatics, Heraklion, Greece, 4th-6th October.*

Contributed posters

3 **Kontopoulos, D.-G.**, Patmanidis, I., Barraclough, T.G., & Pawar, S. (2018) Nonsynonymous mutations are more detrimental at high temperatures; a prokaryote-wide study of adenylate kinases. *Gordon Research Conference on Unifying Ecology Across Scales, Biddeford, ME, United States of America, 22nd-27th July*.

2 **Kontopoulos, D.-G.**, Yvon-Durocher, G., & Pawar, S. (2016) Deep-time macroevolution of thermal sensitivity of growth rate among phytoplankton. *Gordon Research Conference on Unifying Ecology Across Scales, Biddeford, ME, United States of America, 24th-29th July*.

1 **Kontopoulos, D.-G.**, Yvon-Durocher, G., Allen, A.P., Chen, B., Thomas, M.K., & Pawar, S. (2014) Phylogenetic constraints and environmental drivers of thermal adaptation among the phytoplankton. *Annual London Evolutionary Research Network Conference, London, United Kingdom, 5th November*.

Research skills

Thermal biology

- quantifying the shape of thermal performance curves for physiological, ecological, or other biological traits through diverse (80+) nonlinear mathematical models.
- identifying trait-trait and trait-environment associations through phylogenetic generalised linear mixed models with numerous (up to 22 so far) covarying response variables.
- sampling of *Linepithema humile* and *Tapinoma sessile* ants from natural colonies, conducting and analysing behavioral experiments at multiple temperatures.

Phylogenetics

- likelihood-based reconstruction of gene and species trees.
- timetree inference.

Ecological modelling

- modelling predator-prey population dynamics using ordinary differential equations.
- agent-based modelling with NetLogo.

Bioinformatics

- genome alignment and annotation.
- Gene Ontology term enrichment.
- genome-wide screening for signatures of selection, gene losses, or evolutionary rate shifts, associated with a trait of interest.
- analysis of sequence or physicochemical conservation.
- protein structure modelling and comparison.
- molecular dynamics simulations.

Statistics and data science

- Bayesian statistics.
- phylogenetic comparative methods.
- likelihood-based model selection.
- dimensionality reduction and clustering.
- machine learning.

Scientific programming

- extensive experience in Perl and R.
- good experience in Python and SQL.
- basic experience in Common Lisp, C, and Shell.
- version control using Git.
- some experience in web development.

Teaching experience

As a course demonstrator

- **Further Topics in Statistics** **2015-18**
  MSc/MRes "Ecology, Evolution and Conservation", Imperial College London
- **Intro to UNIX and Linux** **2017**
  MSc/MRes "Computational Methods in Ecology and Evolution" and "Quantitative and Modelling Skills in Ecology and Evolution" Centre for Doctoral Training, Imperial College London
- **Statistics** **2014-15**
  BSc "Biological Sciences", year 1, Imperial College London
- **Biological Computing in Python II** **2014**
  MSc/MRes "Computational Methods in Ecology and Evolution", Imperial College London
- **Computational Biostatistics** **2014**
  BSc "Biological Sciences", year 2, Imperial College London

As a course tutor

- **MSc/MRes "Computational Methods in Ecology and Evolution"**, Imperial College London **2014-15**

As a workshop presenter

- **"How to generate topological constraints using the Open Tree of Life"** **30th March 2017**
  Silwood Computer Skillz Workshop, Imperial College London

Student project supervision

- **Georgios Kalogiannis** - MRes "Computational Methods in Ecology and Evolution", Imperial College London. **2024**
  Thesis: "Gene loss is an important signature of insect size evolution"
  Primary supervisor: Samraat Pawar
- **Aditi Madkaikar** - MRes "Computational Methods in Ecology and Evolution", Imperial College London. **2023**
  Thesis: "Predicting the thermal niche of a ubiquitous bacterium using whole genome sequence"
  Primary supervisor: Samraat Pawar
  Other supervisors: Arianna Basile
- **Kate Griffin** - MSc "Computational Methods in Ecology and Evolution", Imperial College London. **2022**
  Thesis: "Can't stand the heat? An analysis of the thermal sensitivity of arthropods, how it has evolved & factors influencing it"
  Primary supervisor: Samraat Pawar
  Other supervisors: Paul Huxley, Lauren Cator

Outreach / public engagement

- Exhibitor at the **Great Exhibition Road Festival**, London, UK **7th-8th May 2016**
- Co-organiser of the **"Drawing Climate Change" activity at the Science Museum Lates**, London, UK **30th March 2016**

Service

Manuscript reviewer for 11 Journals: ***Communications Biology***, ***Communications Earth & Environment***, ***Ecology Letters***, ***Frontiers in Microbiology***, ***Functional Ecology***, ***Journal of Plankton Research***, ***Journal of Thermal Biology***, ***Limnology and Oceanography***, ***Physiological and Biochemical Zoology***, ***Scientific Reports***, and ***Systematic Biology***.

Scientific workshops and courses attended

4 **An Introduction to Mechanistic Niche Modelling with NicheMapR and TrenchR**, 2023 Annual Meeting of the Ecological Society of America, Portland, OR, United States of America. **6th August 2023**

3 **EMBO Laboratory Leadership course**, EMBO Solutions, Heidelberg, Germany. **5th-7th July 2023**

2 **"Introduction to Agent-Based Modelling" Massive Open Online Course**, Santa Fe Institute, held online. **June 2022 - August 2022**

1 **Evolutionary Quantitative Genetics workshop**, Friday Harbor Laboratories, University of Washington, held online. **11th-15th July 2022**

Language skills

Native proficiency in **Greek**, full proficiency in **English**, sufficient proficiency in **French**, basic proficiency in **German**.

References

Prof. Samraat Pawar
Title: Professor of Theoretical Ecology
Affiliation: Department of Life Sciences, Imperial College London, Silwood Park
Email address: s.pawar@imperial.ac.uk

Prof. Michael Hiller
Title: Professor of Comparative Genomics
Affiliation: LOEWE Centre for Translational Biodiversity Genomics, Senckenberg Research Institute, & Goethe University
Email address: michael.hiller@senckenberg.de

Prof. Noa Pinter-Wollman
Title: Professor
Affiliation: Department of Ecology and Evolutionary Biology, University of California, Los Angeles
Email address: nmpinter@ucla.edu

Prof. Timothy G. Barraclough
Title: Professor of Evolutionary Biology
Affiliation: Department of Biology, University of Oxford
Email address: tim.barraclough@biology.ox.ac.uk

Additional information

Member of Scientific Societies: Society for the Study of Evolution, Ecological Society of America, Panhellenic Association of Bioscientists.

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