DIMITRIOS G. ANASTASAKIS

Curriculum Vitae

Work address	Department of Basic Medical Sciences
	School of Medicine
	University of Crete
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My research focuses on uncovering the dynamic and multifaceted roles of RNA in health and disease, with a particular emphasis on RNA-protein interaction networks and RNA G-quadruplexes (rG4s). We aim to elucidate how these intricate molecular structures are regulated and how their dysregulation contributes to disease. By combining computational, molecular, cellular, and structural biology approaches, we address fundamental questions about RNA function in both physiological and pathological contexts. Our lab is dedicated to developing cutting-edge methodologies, such as high-resolution mapping of RNA-protein interactions and innovative techniques for studying RNA and RNA-protein interaction dynamics *in cellulo*, to provide transformative insights into the molecular mechanisms governing RNA biology

EDUCATION

12/2011 – 03/2016 PhD, Department of Biochemistry, School of Medicine, University of Patras. Greece.

09/2009 – 11/2011 M.Sc. in Basic Medical Sciences, Pathobiochemistry, School of Medicine, University of Patras, Greece

09/2003 – 03/2008 B.Sc. in Biochemistry and Biotechnology, University of Thessaly, Larissa, Greece

CURRENT POSITION

1/2025 – current Assistant Professor, Department of Basic Sciences, School of Medicine, University of Crete, Greece

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POSTDOC EXPERIENCE

12/2016 – 12/2022 Postdoctoral fellow. RNA Molecular Biology Laboratory, National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). National Institutes of Health (NIH)

WORK EXPERIENCE

12/2022 – 12/2024 Research fellow. RNA Molecular Biology Laboratory. National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). National Institutes of Health (NIH).

12/2016 – 12/2022 Postdoctoral fellow. RNA Molecular Biology Laboratory, National Institute of Arthritis and Musculoskeletal and Skin Diseases (NIAMS). National Institutes of Health (NIH). Studying Posttranscriptional Gene Regulation by abundant nuclear RNA binding proteins,

12/2011 – 02/2016 PhD Thesis. Department of Biochemistry, School of Medicine, University of Patras, Greece. *Thesis Title: Functional and genomic studies on deadenylation: the role of PNLDC gene.*

10/2011 – 10/2013 Laboratory staff. Department of Biochemistry, School of Medicine, University of Patras, Greece. Diagnosis services at the *Unit for Special Biochemical Analyses*. Performance of specialized biochemical analyses on clinical samples.

09/2010 – 10/2011 M.Sc. thesis. Department of Biochemistry, School of Medicine, University of Patras, Greece. Functional and Genomic studies upon Human Deadenylases.

04/2008 – 05/2009 Postgraduate associate. Department of Obstetrics, Gynaecology and Reproductive Science, School of Medicine, Yale University, USA. Study of FSHR interacting proteins as well as FSHR splice variants and mutants.

9/2006 – 07/2007 B.Sc. thesis. Department of Biochemistry and Biotechnology, University of Thessaly, Greece. Heterologous expression, purification and evaluation of the enzymatic activity of Human poly (A) specific ribonuclease (PARN.

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PUBLICATIONS

1. **Anastasakis D.G.,** Apostolidi M., Garman., K, Polash A.H, Umar M.I., Meng Q., Scuténaire J., Jarvis J., Wang X., Haase A.D., Brownell I., Rinehart J. and Hafner M. (2024). Nuclear PKM2 binds pre-mRNA at folded G-quadruplexes and reveals their gene regulatory role. ***Mol Cell***, 10.1016/j.molcel.2024.07.025.

2. Skeparnias I., Bou-Nader C., **Anastasakis D.G.**, Fan L., Wang Y.X., Hafner M. and Zhang J. (2024). Structural basis of MALAT1 RNA maturation and mascRNA biogenesis. ***Nat Struct & Mol Biol***. 10.1038/s41594-024-01340-4

3. Lobo V., Shcherbinina E., Westholm J.O., Nowak I., Huang H.C., Angeletti D, **Anastasakis D.G.** and Sarshad AA. (2024). Integrative transcriptomic and proteomic profiling of the effects of cell confluency on gene expression. ***Sci Data*** *11*, 617. 10.1038/s41597-024-03465-z.

4. **Anastasakis D.G#.**, Benhalevy. D., Çuburu N., Altan-Bonnet N., and Hafner M. (2024). Epigenetic repression of antiviral genes by SARS-CoV-2 NSP1. ***PLoS One*** *19*, e0297262. 10.1371/journal.pone.0297262. **# co-corresponding author**

5. Fallatah A., **Anastasakis D.G.**, Manzourolajdad A., Sharma P., Wang X., Jacob A. et al. (2023) Keratin 19 binds and regulates cytoplasmic HNRNPK mRNA targets in triple-negative breast cancer. ***BMC Mol Cell Biol***. 24(1):26

6. Muys B.R., Shrestha R.L., **Anastasakis D.G.**, Pongor L., Li X.L., Grammatikakis I., et al. (2023) Matrin3 regulates mitotic spindle dynamics by controlling alternative splicing of CDC14B. ***Cell Rep***. 42(3):112260.

7. Enomoto, Y., Li, P., Jenkins, L.M., **Anastasakis, D**., Lyons, G.C., Hafner, M. and Leonard, W.J. (2021) Cytokine-enhanced cytolytic activity of exosomes from NK Cells. ***Cancer Gene Ther****.* 29, 734–749

8. Grafanaki, K., Skeparnias, I., Kontos, C.K., **Anastasakis, D**., Korfiati, A., Kyriakopoulos, G., Theofilatos, K., Mavroudi, S., Magoulas, G., Papaioannou, D. et al. (2021) Pharmacoepigenomics circuits induced by a novel retinoid-polyamine conjugate in human immortalized keratinocytes. ***Pharmacogenomics J****.* 21, 638–648

9. Wan, Y*., **Anastasakis, D.G***., Rodriguez, J., Palangat, M., Gudla, P., Zaki, G., Tandon, M., Pegoraro, G., Chow, C.C., Hafner, M. et al. (2021) Dynamic imaging of nascent RNA reveals general principles of transcription dynamics and stochastic splice site selection. ***Cell****,* 184, 2878-2895.e2820. ***equal contribution**

10. **Anastasakis, D.G**., Jacob, A., Konstantinidou, P., Meguro, K., Claypool, D., Cekan, P., Haase, A.D. and Hafner, M. (2021) A non-radioactive, improved PAR-CLIP and small RNA cDNA library preparation protocol. ***Nucleic Acids Res***, 27:gkab011

11. Muys, B.R., **Anastasakis, D.G**., Claypool, D., Pongor, L., Li, X.L., Grammatikakis, I., Liu, M., Wang, X., Prasanth, K.V., Aladjem, M.I. et al. (2021) The p53-induced RNA-binding protein ZMAT3 is a splicing regulator that inhibits the splicing of oncogenic CD44 variants in colorectal carcinoma. ***Genes Dev***, 35, 102-116.

12. Brown, R.S., **Anastasakis, D.G**., Hafner, M. and Kielian, M. (2020) Multiple capsid protein binding sites mediate selective packaging of the alphavirus genomic RNA. ***Nat Commun****,* 11, 4693.

13. **Anastasakis, D**., Benhalevy, D. and M. Hafner. 2020. 'Proximity-CLIP and Expedited Non-Radioactive Library Preparation of Small RNA Footprints for Next-Generation Sequencing', ***Curr Protoc Mol Biol****,* 131: e120.

14. Skeparnias, I*., **Anastasakis, D***., Grafanaki, K., Kyriakopoulos, G., Alexopoulos, P., Dougenis, D., Scorilas, A., Kontos, C.K. and Stathopoulos, C. (2020) Contribution of miRNAs, tRNAs and tRFs to Aberrant Signaling and Translation Deregulation in Lung Cancer. ***Cancers*** (Basel), 12. ***equal contribution**

15. Muys, B.R., Sousa, J.F., Plaça, J.R., de Araújo, L.F., Sarshad, A.A., **Anastasakis, D.G**., Wang, X., Li, X.L., de Molfetta, G.A., Ramão, A. et al. (2019) miR-450a Acts as a Tumor Suppressor in Ovarian Cancer by Regulating Energy Metabolism. ***Cancer Research***, 79, 3294-3305.

16. Grafanaki, K., **Anastasakis, D.,** Kyriakopoulos, G., Skeparnias, I., Georgiou, S. and Stathopoulos, C. (2019) Translation regulation in skin cancer from a tRNA point of view. ***Epigenomics***, 11, 215-245.

17. Sharma, P., Alsharif, S., Bursch, K., Parvathaneni, S., **Anastasakis, D.G**., Chahine, J., Fallatah, A., Nicolas, K., Sharma, S., Hafner, M. et al. (2019) Keratin 19 regulates cell cycle pathway and sensitivity of breast cancer cells to CDK inhibitors. ***Sci Rep****,* 9, 14650.

18. Rosshart, S.P., Herz, J., Vassallo, B.G., Hunter, A., Wall, M.K., Badger, J.H., McCulloch, J.A., **Anastasakis, D.G**., Sarshad, A.A., Leonardi, I., et al. (2019). Laboratory mice born to wild mice have natural microbiota and model human immune responses. ***Science****,* 365.

19. Palangat, M., **Anastasakis, D.G**., Fei, D.L., Lindblad, K.E., Bradley, R., Hourigan, C.S., Hafner, M., and Larson, D.R. (2019). The splicing factor U2AF1 contributes to cancer progression through a noncanonical role in translation regulation. ***Genes Dev***. 1;33(9-10):482-497

20. Sarshad, A.A., Juan, A.H., Muler, A.I.C., **Anastasakis, D.G**., Wang, X., Genzor, P., Feng, X., Tsai, P.-F., Sun, H.-W., Haase, A.D., et al. (2018). Argonaute-miRNA Complexes Silence Target mRNAs in the Nucleus of Mammalian Stem Cells. ***Mol Cell*** 71, 1040–1050.e1048.

21. Li, J., Wang, X., Ackerman, W.E.4., Batty, A.J., Kirk, S.G., White, W.M., Wang, X., **Anastasakis, D**., Samavati, L., Buhimschi, I., et al. (2018). Dysregulation of Lipid Metabolism in Mkp-1 Deficient Mice during Gram-Negative Sepsis. *Int J Mol Sci* 19(12)

22. Benhalevy, D., **Anastasakis, D.G**., and Hafner, M. (2018). Proximity-CLIP provides a snapshot of protein-occupied RNA elements in subcellular compartments. ***Nat Methods*** 15, 1074–1082.

23. Tsai PF, Dell'Orso S, Rodriguez J, Vivanco KO, Ko KD, Jiang K, Juan AH, Sarshad AA, Vian L, Tran M, Wangsa D, Wang AH, Perovanovic J, **Anastasakis D**, Ralston E, Ried T, Sun HW, Hafner M, Larson DR, Sartorelli V. (2018) A Muscle-Specific Enhancer RNA Mediates Cohesin Recruitment and Regulates Transcription In trans. ***Mol Cell***. 5;71(1):129-141.e8.

24. Toumpeki C, **Anastasakis D**, Panagoulias I, Stamatopoulou V, Georgakopoulos T, Kallia-Raftopoulos S, Mouzaki A, Drainas D. (2018) Construction of an M1GS ribozyme for targeted and rapid mRNA cleavage; application on the Ets-2 oncogene. ***Med Chem***. 11.

25. Skeparnias I*., **Anastasakis D***., Shaukat A.-N., Grafanaki K. and Stathopoulos C. (2017) Expanding the repertoire of deadenylases. ***RNA Biology***, 10.1080/15476286.2017.1300222

***equal contribution**

26. **Anastasakis D**., Skeparnias I., Shaukat A-N., Grafanaki K., Kanellou A., Taraviras S., Papachristou D., Papakyriakou A. and Stathopoulos C. (2016) Mammalian PNLDC1 is a novel poly(A) specific exonuclease with discrete expression during early development. ***Nucleic Acids Res***. 44: 8908-89

27. Balatsos N. A. A., Maragozidis P., **Anastasakis D**. and Stathopoulos C. (2012) Modulation of poly(A)-specific ribonuclease (PARN): current knowledge and perspectives. ***Current Med. Chem***. 94: 214-221.

28. Balatsos N. A. A., Vlachakis D., Maragozidis P., Manta S., **Anastasakis D**., Kyritsis A., Vlassi M., Komiotis D. and Stathopoulos C. (2009) Competitive inhibition of human poly(A)- specific ribonuclease (PARN) by synthetic fluoro-pyranosyl nucleosides. ***Biochemistry*** 48: 6044-6051

29. Balatsos N. A. A., **Anastasakis D**., and Stathopoulos C. (2009) Inhibition of human poly(A)- specific ribonuclease (PARN) by purine nucleotides: kinetic analysis. ***J. Enz. Inh. Med. Chem***. 24: 516-523.

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AWARDS / GRANTS

2025 EMBO Young Investigator / EMBO Installation Grant. Sum awarded: 250,000€ (50.000€ annual, up to 5 years)

2024 Hellenic Foundation for Research and Technology Action “Science and Society” – “Always Strive for Excellence-Theodore Papazoglou” (co-funded by the Stavros Niarchos Foundation and H.F.R.I.). Sum awarded 100.000€

2023 National Institute of Arthritis and Musculoskeletal and Skin Diseases Outstanding Fellow Award ($5000)

REVIEWING ACTIVITY

Epigenomes (1 article), *Cells* (4 articles), *Cancers* (1 article), *IJMS* (1 article), Genomics (3 articles), STAR protocols (1 article)

INVITED TALKS

1. RNA Binding proteins: Maestros of Eucaryotic Gene Expression, Institute of Molecular Biology and Biotechnology of the Foundation for Research and Technology - Hellas in Greece (IMBB-FORTH), Crete, 2024
2. PKM2 binds pre-mRNA G-quadruplex structures revealing a novel cancer regulome, RNA CLUB, National Institutes of Health (NIH), 2022