

BIOGRAPHICAL SKETCH

NAME: Tomás Duraj, MD, PhD

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POSITION TITLE: Postdoctoral researcher

EDUCATION/TRAINING

INSTITUTION AND LOCATION	DEGREE	END DATE	FIELD OF STUDY
Rey Juan Carlos University, Madrid, Spain	M.D.	2016	Medical Degree (MD), Spanish license number ICOMEM 282881804
San Pablo CEU University, Madrid, Spain	Ph.D.	2022	Doctorate in Translational Medicine (PhD), Cum laude, international distinction

Summary

Dr. Duraj is a medical doctor of Czech-Austrian origin, receiving his Medical Degree from the Rey Juan Carlos University and his PhD in Translational Medicine from the CEU San Pablo University. His scientific research has focused mainly on studying the potential of bioenergetic modulation and cancer metabolism, with special emphasis on glioblastoma, the most aggressive and lethal primary brain tumor. After developing cancer research at the team of Dr. Ayuso Sacido in Madrid, he joined Dr. Seyfried laboratory at Boston College. In his clinical practice, he specializes in health optimization through nutritional and lifestyle interventions for diseases with a metabolic root cause or therapeutic approach: cancer, insulin resistance and diabetes, obesity, metabolic syndrome, cardiovascular disease, epilepsy, and longevity. Throughout his research career, he has authored original, peer-reviewed scientific publications and lectured on cancer and primary prevention in podcasts and popular-science editorials. His goal is to advance our understanding of metabolic therapy on a rigorous, evidence-based background, making it a part of the standard oncology toolkit, so that all patients can benefit.

Personal Statement

I am officially trained as a physician, but after obtaining my medical degree I decided to shift my career path towards cancer research, as I felt this discipline was better suited for my personal aspirations and skills. During my PhD, I received extensive training in basic molecular biology and research methodology. I believe I can now combine the best of both worlds, with a clinical and research perspective. I have always been fascinated with cancer metabolism and thus pursued a research path in brain cancer (glioblastoma) at the laboratory of Dr. Ángel Ayuso Sacido (ORCID 0000-0003-3919-5880). Glioblastoma is a suitable model to study aberrant metabolism, as this devastating disease can only be managed with a paucity of ineffective treatments. During my PhD, I have authored two publications as an independent researcher. I strongly believe that elucidating the oncometabolic picture of cancer will be key to overcome current therapeutic limitations.

Positions and Scientific Appointments

2022 - present	Postdoctoral researcher, Boston College (USA)
2021 - 2022	Scientific Director, Jazaks Lab, S.L (actiage.es)
2017 - 2022	University teacher training program (FPU) competitive grant, Spanish Ministry of Education, Culture and Sports (MECD)
2016 - 2018	Member, International Society for Cancer Metabolism

Honors

2012 - 2016	Scholarship for University studies, Spanish Ministry of Education, Youth and Sports
2012 - 2014	Excellence Scholarship of the Community of Madrid, Ministry of Education, Youth and Sports
2011	Outstanding high school student, Ministry of Education, Province of Las Palmas, Spain
2009	XXXIII edition of the Félix-Francisco Casanova Awards, Cabildo Insular de La Palma

Contribution to Science

- My early scientific work addressed the impact of cafeteria diets in Wistar male rats. I became interested in the effects of high-sugar, high-fat diets, compared to species-specific standard and high-fat diets alone. Our hypothesis aimed to elucidate the effects of simple carbohydrates in a high fat diet, as compared to the known beneficial effects of a ketogenic diet.
- **Duraj T**, López-Miranda González V. Macronutrients and metabolic health: effects of a cafeteria diet on biomarkers of metabolic syndrome and analysis of prevention and treatment strategies. III Congress of Medicine URJC; 2016. ISSN: ISSN-2444-5479(III)
- During my PhD, I proposed an independent project to study the metabolic characteristics of glioblastoma cancer stem cells (GSCs) described by the group of Dr. Ángel Ayuso Sacido. The group did not previously characterize the metabolism of their GSCs models, so during my training we explored the therapeutic opportunities of targeting metabolism, as well as metabolic flux analysis to learn more about the intrinsic differences between stem and non-stem cells. We also detected a potential synergy between glutamine inhibitors and standard of care (radiomimetics), that warrant further exploration in animal models.
- **Duraj T**, García-Romero N, Carrión-Navarro J, Madurga R, Ortiz de Mendivil A, Prat-Acin R, Garcia-Cañamaque L, Ayuso-Sacido A. Beyond the Warburg Effect: Oxidative and Glycolytic Phenotypes Coexist within the Metabolic Heterogeneity of Glioblastoma. *Cells* 10.2 (2021): 202. Available at: <https://pubmed.ncbi.nlm.nih.gov/33498369> DOI: 10.3390/cells10020202.
- **Duraj T**, Esteban Rubio S, Rackov G, Carrión Navarro J, García Romero N, Barbas Arribas C, Ayuso Sacido A. Metabolic therapy in cancer: role of metabolism and nutrition in human glioma. *NUTRIMAD* 2018, RENC. October 2018. DOI: 10.14642/RENC.2018.24.sup2.5190
- At the tail-end of my PhD, I felt sufficiently confident in my expertise of cancer metabolism to summarize and review the major advancements and methodological issues faced by researchers in this field. We provided practical guidance and a broad overview of techniques to study metabolism, and, for the first time, indexed all applicable Seahorse XF OCR/ECAR experimental results in a comprehensive format. I believe this is a significant contribution as oxygraphic measurements are highly heterogeneous, and researchers are not aware of the need to normalize, standardize and share their results in a way that is helpful for others to compare in inter-laboratory settings.
- **Duraj T**, Carrión-Navarro J, Seyfried T, García-Romero N, Ayuso-Sacido A. Metabolic therapy and bioenergetic analysis: The missing piece of the puzzle. *Molecular Metabolism* 54 (2021): 101389. Available at: <https://pubmed.ncbi.nlm.nih.gov/34749013> DOI: 10.1016/j.molmet.2021.101389.
- After obtaining my PhD, I joined Dr. Thomas N. Seyfried (ORCID 0000-0003-1491-3989) laboratory at Boston College (USA) to continue developing metabolic therapies for cancer management. It is our hope and effort to establish metabolic therapy, as defined by simultaneous targeting of substrate-level phosphorylation fuels in cancer cells (mainly, glucose and glutamine) while simultaneously providing oxidative fuels for normal cells (ketone bodies), as the first, preferred approach offered after any cancer diagnosis.
- Seyfried T. N., Arismendi-Morillo G., Zuccoli G., Lee D., **Duraj T**, Elsakka A., Maroon J., Mukherjee P., Ta L., Shelton L., D'Agostino D. P., Kiebish M. A., Chinopoulos C. Metabolic management of microenvironment acidity in glioblastoma. *Frontiers in Oncology* (2022). Available at: <https://frontiersin.org/articles/10.3389/fonc.2022.968351> DOI: 10.3389/fonc.2022.968351

Dissertation in English, available at <http://hdl.handle.net/10637/13791>.

Complete List of Published Work in My Bibliography:

<https://www.ncbi.nlm.nih.gov/myncbi/tomas.duraj.1/bibliography/public/>