

Ilaria Elia

Assistant Professor, KU Leuven

Dr. Ilaria Elia is an assistant professor at KU Leuven, leading the laboratory of Metabolic Regulation of Cell Function since 2021.

Dr. Elia conducted her Ph.D. studies in the laboratory of Prof. Sarah-Maria Fendt (VIB, KU Leuven). There, she investigated the metabolic requirements of metastasizing breast cancer cells in lung metastasis. She made a significant discovery, revealing the essential role of the amino acid proline in generating ATP during metastatic colonization (Elia *et al.*, Nature Communications, 2017). Additionally, she uncovered the crucial role of pyruvate-driven α -ketoglutarate metabolism in extracellular matrix remodeling, despite the transcriptional regulation of the rate-limiting enzyme P4HA (Elia *et al.*, Nature, 2019). This research was highlighted in a Research Watch article by Cancer Discovery and a Research Highlight article by Nature Reviews Cancer.

Afterward, she pursued a postdoc on immunometabolism at Harvard Medical School in the laboratories of Prof. Marcia Haigis and Prof. Arlene Sharpe. She has successfully applied for funding to cover her postdoctoral studies (EMBO and CRI) and presented her work at several international conferences. During her postdoctoral work, Dr. Elia optimized a co-culture system replicating the interaction between cancer cells and immune cells in an *in vivo* tumor microenvironment-like setting. This system allowed the discovery of two targets. First, she identified that pyruvate anaplerosis drives succinate signaling and anti-tumor immunity (Elia *et al.*, Cell Metabolism, 2022). Second, her research unveiled the enhancement of immunotherapy strategies through one-carbon metabolism (Rowe*, Elia* *et al.*, Cancer Discovery, 2023).

In August 2021, she started her laboratory at KU Leuven, focusing on investigating how the local nutrient microenvironment affects metabolic reprogramming and T cell function. To address this challenge, her laboratory aims to investigate the metabolic competition between T cells and tumor cells in local metabolic niches. They seek to modulate the metabolic activity of immune cells to facilitate infiltration into hostile metabolic areas and achieve a complete response to immunotherapy. Dr. Elia has secured significant funding for her independent research group, presented at international conferences, wrote two review articles, and undertook several institutional responsibilities. Finally, she has recently received the prestigious FEBS Excellence Award and the Beug Foundation Metastasis Prize.