PROFILE FOR INSTITUTE WEBSITE

Current photo in graphic file e.g. 2025	
Name and surname, Title	Michel Edwar Mickael, PhD
Position	Assistant Professor, Department of Experimental Genomics
Hirsch Index and Number of citations (according to Scopus) on the day of completing the form	Hirsch Index =15, Number of=684
Research areas (in points, min. 200 characters, max. 500 characters)	**My research focuses on the Th17/Treg and gut-brain axes across neuroimmune, metabolic, and immunology contexts, including:** ○ Mechanistic Plasticity: Study Th17, Treg, and Tfh plasticity via transcriptional and epigenetic regulation in autoimmune, metabolic, and neurodegenerative diseases. ○ AI Integration: TCR (CDR3) sequencing with AI predicts antigen specificity, clonal expansion, and functional outcomes. ○ BBB Migration: Peripheral Th17 and Treg migration along the gut-brain route in IBD, colitis, and diabetes, including chemokine-guided interactions with the blood-brain barrier. ○ Brain Interactions: Th17/Treg interactions with neurons, influenced by BDNF, serotonin, opioids, and dietary compounds such as ginger and curcumin.
Total number of completed research projects; currently implemented research projects (title and number) and selected max. 3 completed projects (title and number) from the newest ones, i.e. 2024, 2023, 2022…	**Research Funding Portfolio** ○ Grant Title: Identifying the effect of ginger supplementation on counteracting dysbiosis in diabetes, Grantor: NCN Opus Grant (Co-Investigator Project), Grant Code: UMO-2024/55/B/NZ9/02271, Value: 1.2 million PLN, Year: 2025.

	○ Grant Title: Innate lymphoid cells – the European quest for innovative cancer prognosis and immunotherapy (ILCquest), Grantor: COST Action Grant Code: CA24117, Value: 130,000 euros, Year: 2025. ○ Grant Title: The migration of Th17 to the brain in neurological diseases Grantor: EFIS (European Federation of Immunological Societies), Grant Code: 2024/2025, Value: 55,000 PLN , Year: 2024. ○ Grant Title: Studying the role of Th17/Treg in Rheumatoid Arthritis, Grantor: EULAR (European Association of Rheumatoid Arthritis) Grant Code: Q324RSV181 Value: 25,000 PLN Year: 2024. ○ Grant Title: Building an AI software for drug mining of Th17/Treg, Grantor : NLnet Grant Code: 2022/1 Value: 25,000 PLN Year: 2022. ○ Grant Title: Bench to bedside transition for pharmacological regulation of NRF2 in noncommunicable diseases (BenBedPhar), Grantor: COST Action, Grant Code: CA20121, Value: 130,000 euros , Year: 2021. ○ Grant Title: Investigating the role of Th17 in neurological diseases, Grantor: PhiloMako, Grant Code: 067, Value: 250000 PLN, Year: 2020.
Total number of publications; ORCID (number and hyperlink to the profile); SCOPUS (number and hyperlink to the profile); indicate selected publications (max. 5)	– Total number of publications on Scopus is 59 – https://www.scopus.com/authid/detail.uri?authorId=57190137642 – Total number of publictaions on ORCID is 57 – https://orcid.org/my-orcid?orcid=0000-0002-4186-4900
Total number of patents; selected patents (max. 2) and a hyperlink to personal patent achievements (UP RP), on the day of completing the form	– Under submission at the Swedish patent agency, Title : A natural material that reduces inflammation in spinal cord injury.
Selected scientific achievements from the newest, i.e. 2023, 2022, 2021... (in points, min. 800 characters, max. 1000 characters)	**Selected scientific achievements** – I demonstrated that LSTM- and LeakyReLU-based GANs generate diverse, biologically realistic CDR3 TCR sequences, advancing eTCR therapies. – I showed that deep and anatomically stratified neural networks predict primary tumor origins from CNA/CNV profiles, linking results to Th17/Treg dynamics for immunotherapy. – We proved AIRE1 and FEZF2 evolved via distinct pathways to regulate tissue-restricted antigen expression, coordinating T-cell selection. – We identified the metabolic CD36/Acod1 axis as a key driver of persistent Treg activation in sepsis. – We pinpointed MCC gene family evolution shaping the Th17/Treg axis and Treg differentiation. – We identified key genes and pathways distinguishing Th17 and Treg cells, including Keap1, MCC1, ATP-hydrolyzing enzymes, and insulin-mediated regulators.

	– We demonstrated pathogenic RORγt^{+} Th17 cells in colitis infiltrate the brain, causing neuroinflammation and behavioral disorders. – We discovered RORγt maintains Foxp3 in colonic Tregs by repressing T-bet, critical for Treg-mediated immunosuppression.
Number and list of defended PhD students from the latest, i.e. 2024, 2023, 2022...	**I supervised several PhD students including** – Dr. Norwin Kubick (2025) – Dr. Ashish Rajput (2018) – Biniyam Tesfaye (2029/2030)
Organizational activities, dissemination of knowledge and others (in points, min. 300 characters, max. 1000 characters)	– Head of WG1 of Archaeology in AI COST Action, with the main focus on understanding how the TCR repertoire evolved from ancient humans to modern populations and transferring this information to the public – Editor of Current Ethics, a publication aimed at the public that covers contemporary biological ethical questions in simplified language. – Lecturer at Immunology Day, improving public understanding of immunology topics, including vaccines, highlighting both benefits and potential drawbacks. – Authour of several book chapters that help introduce complex immunological information in simple terms.