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Enthusiastic researcher with 3 years of hands-on experience in proteomics and interactomics. Currently my research interests concern the role of human LINE-1 retrotransposons in healthy aging and disease. To improve our understanding of how activation of LINE-1 elements contribute to disease, we employ affinity capture and mass spectrometry along with other biochemical approaches to identify interactions responsible for disease progression and to dissect its mechanisms of action. Despite my focus on LINE-1 biology, I have been involved in several other projects, including the characterization of affinity captured DNAJB1-PRKACA protein interactome in fibrolamellar hepatocellular carcinoma, a pediatric liver cancer, whose oncogenesis is driven by a genetic fusion event between DNAJB1 and PRKACA.

Education

PhD student at the University Medical Center Groningen (UMCG), the Netherlands Nov 2023-present
Laboratory of Macromolecules and Interactomes (Dr. John LaCava)

Research topic: Unraveling the role of LINE-1 retrotransposons as provocateurs of autoinflammation and inflammaging

Molecular Medicine and Innovative Treatment (MSc) at the University of Groningen, The Netherlands. (Average grade: 8.1, distinction "Cum Laude") 2021-2023

Second Year Project- The Rockefeller University, NYC, The United States. Laboratory of Cellular and Structural Biology (Prof. Dr. Michael Rout; Prof. Dr. John LaCava)- (6 months)

Research topic: Investigating the interplay of LINE-1 retrotransposon proteins with mitochondria and its contribution to the production of immune triggering cytoplasmic RNA:DNA hybrids.

Core skills obtained:

- Mitochondrial isolation by differential centrifugation and affinity capture
- Subcellular fractionation by density gradient ultracentrifugation
- Immunoprecipitation of protein complexes
- Molecular cloning (site directed mutagenesis)
- Cell culture and suspension cell transfections

Capita Selecta (Literature Review): Mitochondrial dysfunction in breast cancer: cause or result?

In this literature review I collected and evaluated published data on metabolic activity changes in breast cancer and its subtypes, to corroborate the role of mtDNA mutations in breast cancer formation and progression. Further, I discussed the current approaches for targeting mitochondria to treat breast cancer or suppress its metastasis.

First Year Project- University Medical Center Groningen. Department of Gastroenterology and Hepatology (Prof. Dr. Klaas Nico Faber)- (6 months)

Research topic: The role of GDF7 in liver fibrosis and its effect on liver proliferation.

Core skills obtained:

- FFPE tissue preparation
- Immunofluorescence (IF), Immunohistochemistry (IHC)
- Organoid culture
- RNA extraction, cDNA synthesis and qPCR

Biology (BSc) at The University of Sheffield (Grade: 1st class, honors), United Kingdom 2017-2020

Dissertation (75%): Literature review on ZFNs, TALENs and CRISPR/Cas9 genome editing technologies.

- Thorough examination and comparison of the characteristics of different genetic engineering technologies.
- Detailed analysis of their mechanisms of action and their applications in research.

Final Year Project (72%): Investigated the role of self-extracellular DNA (self-exDNA) on *A.thaliana* immunity. (Prof. Dr. Jurriaan Ton)

- Explored the hormone signalling pathways induced as a response to self-exDNA.
- Examined the effects of synthetic self-exDNA on defence eliciting activity, relative to genomic self-exDNA, as well as potential exDNA size-dependent effects in inducing plant immunity.

Key modules: Molecular and cell biology, Applied molecular biology, Biotechnology and food security, Molecular evolutionary genetics, Data analysis with R, Evolutionary biology.

Foundation year in biology at Network foundation, Mark: 80% (A) 2016-2017

Equivalent to A-levels | Courses included: Biology, Chemistry, Maths & Statistics.

Secondary education at 2nd High school of Vrilissia, Athens, Greece 2011-2017

High school graduate (Apolytirion grade: 17.2/20)

Youth Exchange program 'International high five: Personal career portfolio' by Erasmus+, Poland April 2016

- Explored the educational and professional opportunities of a foreign country, in the field of life sciences.
- Developed my presentation, teamwork, and time-management skills, through engaging into various educational activities and workshops.

Achievements and Awards

- **PhD fellowship 2023 from the Graduate School of Medical Sciences (GSMS) at the University of Groningen/ University Medical Center Groningen (UMCG)**
This fellowship provides funding for a 4-year doctoral program at UMCG. It is granted to just four students from the Master's program 'Molecular Medicine and Innovative Treatment' (MMIT), who

submit the most outstanding research proposals. The selection process involves a thorough assessment by a scientific committee.

- **Marko Polo Fund 2022-2023 from the University of Groningen**

Grant offered to exceptional students towards conducting an internship abroad at a top university outside Europe.

- **Groningen University Fund (GUF) 2022**

The GUF subsidizes various activities that benefit studies at the University of Groningen.

- **Holland Scholarship 2022/2023**

The Holland Scholarship is made available by the Dutch Ministry of Education Culture and Science together with Dutch research universities. It is meant for students who want to do research or an internship outside the European Economic Area (EEA).

- **De Cock-Hadders Stichting**

The De Cock-Hadders Foundation provides financial support to CPE, MMIT and IMIM students for international internships in the fields of medicine, dentistry, movement sciences.

- **MMIT GUIDE funding**

Groningen University Institute for Drug Exploration (GUIDE) provides reimbursement for costs directly related to internships abroad including travel costs, visa fees, rent etc.

- **MMIT Ubbo Emmius funding**

This grant is specifically for second year MMIT students who do not receive a full-scholarship from the UMCG, in order to conduct a research internship abroad.

Work Experience

The Rockefeller University, NYC, The United States

December 2022- December 2023

Foreign Research Intern at the Laboratory of Cellular and Structural Biology (Prof. Dr. Michael Rout; Prof. Dr. John LaCava)

Research topic: Investigating the interplay of LINE-1 retrotransposon proteins with mitochondria and its contribution to the production of immune triggering cytoplasmic RNA:DNA hybrids.

European Institute for the Biology of Ageing (ERIBA)

December 2020-October 2022

Research technician at the Laboratory of Macromolecules and Interactomes (Dr. John LaCava)

- Gained exposure to a variety of molecular techniques (CRISPR/Cas9, cell culture, western blot, immunoprecipitation, molecular cloning, transfection, fluorescent microscopy, DNA/protein extraction, bacterial transformation)
- Designed small-scale experiments (e.g. generation of cell lines, vector cloning)

Contributed to the following projects:

- Dissection of the DNAJB1-PRKAcA protein interactome by affinity purification and mass spectrometry from patient material with Fibrolamellar Hepatocellular Carcinoma (FLHCC)
- Comparative Interactomic Analyses of LINE-1 Ribonucleoprotein from Carcinoma Cells
- The role of LINE-1 retrotransposable elements in neurodegeneration and autoinflammatory diseases
- Interplay of LINE-1 proteins with mitochondria

Collaborations with multiple labs around the world: Prof. Dr. Michael Rout Lab, Rockefeller University; Prof. Dr. Yilmaz Lab, MIT; Prof. Dr. Burns Lab, Dana-Farber Cancer Institute; Dr. Benjamin Greenbaum Lab, Memorial Sloan Kettering Cancer Center; Prof. Dr. Tomas Mustelin Lab, University of Washington.

Collaborations with pharmaceutical industry: Ribon therapeutics, Inc.; ROME therapeutics

Biomedical Research Foundation Academy of Athens

June 2019-August 2020

Internship at the Department of Fundamental Research (Dr. Marios Agelopoulos)

- Performed phylogenetic analysis of sequence data (databases/software used: Ensembl, Ncbi, UniProt, Galaxy, Clustal, iTOL, R)
- Identified potential transcription factor binding sites on DNA sequences
- Gained knowledge on laboratory procedures (ChIP-seq, cell culture)

General Anticancer Oncology Hospital "Agios Savvas"

June 2018-July 2018

Summer internship at the Department of Cancer Cytogenetics

- Gained empirical experience on routine procedures of blood analysis for cancer diagnosis and prognosis.
- Received training in the following procedures:
 - Genomic DNA extraction from whole blood
 - Cytogenetic analysis (Blood cell culture, Chromosome isolation, Chromosome staining / G-banding, Karyotyping)
 - Fluorescence in situ hybridization in lymphocytes from patients with leukemia

Workshops and Masterclasses

Industry Perspectives in Innovative Medicine Summer School, Groningen, the Netherlands July 2022

This one-week interactive program is designed for advanced undergraduate and Master's students seeking to explore the practical aspects of biomedical research beyond academia. The program combines guest lectures, site visits, and interactive workshops, where students collaborate in groups with experienced business coaches from the Groningen Business Generator. Together, they develop a business proposal based on their own research findings.

Macromolecular Structures in Cancer Research, Oncode Institute, NKI, the Netherlands November 2019

The masterclass lectures encompassed advanced methodologies, employed in the examination of macromolecular structures. These included state-of-the-art techniques, such as X-ray crystallography, single particle electron microscopy, biophysical methods for quantifying macromolecular interactions, and protein expression and characterization approaches. Additionally, the lectures highlighted the opportunities presented by the Instruct and iNEXT consortia across Europe.

Qualifications

- **Safe Microbiological Technique Certificate-VMT Certificate** (University of Groningen)
- **Industry Perspectives on Innovative Medicine** (University of Groningen Summer Schools)
- **B1 level French certificate** (Université Paris-Sorbonne)
- **Certificate of Proficiency in English** (level C2, Cambridge university | University of Michigan)

References

References available on request.

