MEDICAL UNIVERSITY OF WARSAW

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ESC Council on Basic Cardiovascular Science

First Contact Initiative Grant 2021 Report
Monika Maria Gawałko, MD, PhD

Current Institution: **1st Department of Cardiology, Medical University of Warsaw, Poland**
Head: Prof. Marcin Grabowski, MD, PhD

Host institution: **Laboratory of Cardiac Physiology, Department of Biomedical Sciences, University of Copenhagen, Denmark**
Head: Prof. Thomas Jespersen, MD, PhD
Supervisor: Dr. Arnela Saljic, PhD

Project: "**Paracrine effect of pericardial adipose tissue on atrial fibrillation**"

First of all, I would like to express my sincere gratitude to the European Society of Cardiology and the Council for Basic Cardiovascular Science for awarding me with the First Contact Initiative Grant, which gave me the opportunity to visit Prof. Thomas Jespersen and his research group at **Laboratory of Cardiac Physiology, Department of Biomedical Sciences, University of Copenhagen, Denmark**. The **Laboratory of Cardiac Physiology** is excellent, interdisciplinary laboratory, which covers physiology of circulation and molecular cardiology. The **Laboratory of Cardiac Physiology**'s research is translational and placed in the cross-field between basic health research and the clinic/industry aiming to generate new knowledge that can be used in the prevention and treatment of cardiovascular disease.

My research objectives involve the identification of molecular biology of pericardial adipose tissue in atrial fibrillation including paracrine mechanisms through which it affects physiology of human atrial cardiomyocytes. Recently pericardial adipose tissue emerged as a novel key player in atrial fibrillation pathogenesis (1). However, the underlying pathobiology of pericardial adipose tissue in atrial fibrillation is poorly understood. Recent study on patients with acute coronary syndrome (2) reported that the nucleotide-binding domain, leucine-rich-containing family, pyrin domains-containing-3 (NLRP3) inflammasome, a key player in atrial fibrillation development, is highly active in pericardial adipose tissue (3). Whether the NLRP3 inflammasome is present and upregulated in pericardial adipose tissue of atrial fibrillation patients is unknown, why this is the main objective of my project. Under supervision of Prof. Dobrev, I am conducting this project at **Institute of Pharmacology, University Duisburg-Essen, Germany,** on human samples, to assess whether NLRP3 inflammasome is strongly activated in the pericardial adipose tissue of atrial fibrillation patients, and which factors act on atrial cardiomyocytes, ultimately leading to atrial fibrillation.

Under supervision of Prof. Thomas Jespersen and Dr. Arnela Saljic I had the opportunity to extend the project to animal models to better understand the bilateral mechanisms underlying the atrial fibrillation and pericardial adipose tissue, and expand my basic research skills.

During my stay I worked closely with the members of the team of Prof. Jespersen, and I would like to take the opportunity to express my gratitude for all their help with my training on animal model experiments. It was a great experience to work with this team who were all extremely professional, friendly, and helpful during the whole duration of my stay. Through close cooperation, I had the opportunity to participate in the Dr. Saljic's project on the protective effect of colchicine against atrial fibrillation. Courtesy of Dr. Saljic, I had the privilege to obtain biological material in the form of pericardial adipose tissue and myocardium from her animal models, which enriched my project with animal material showing the effect of induced atrial fibrillation on biological parameters of pericardial adipose tissue.

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During fellowship, I have greatly benefited from the opportunity I had to attend many presentations, journal clubs and lectures related to performed animal experimental studies by the host research group. Academically, I learnt a lot from the many scientific discissions I actively participated in resulting in an overall very productive training.

The skills and knowledge that I have acquired during the training will be used for further projects on animal models, as during the fellowship in Prof. Jespersen's lab, I realized the importance of research conducted with the participation of both, animal and human models.

Importantly, this visit helped me to strengthen my professional network and laid out the basis for a new and fruitful collaboration between home and host laboratories in order to acquire new knowledge into animal experimental studies as well as the materials necessary to explore the bilateral correlation between atrial fibrillation and pericardial adipose tissue.

In conclusion, my visit to Prof. Jespersen's laboratory has been an enriching experience, not only at the professional but also at the personal level.

Your sincerely,
Monika Maria Gawałko

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2. Pedicino D, Severino A, Ucci S, Bugli F, Flego D, Giglio AF, et al. Epicardial adipose tissue microbial colonization and inflammasome activation in acute coronary syndrome. Int J Cardiol. 2017;236:95-99.
3. Heijman J, Muna AP, Veleva T, Molina CE, Sutanto H, Tekook M, et al. Atrial Myocyte NLRP3/CaMKII Nexus Forms a Substrate for Postoperative Atrial Fibrillation. Circ Res. 2020;127:1036-1055.