Project code: 2024-1-IT02-KA171-HED-000212880

Name and Surname: Daniela Beghelli
Home Institution: School of Biosciences and Veterinary Medicine, University of Camerino, Italy
Host Institution: Division of Immunology, Department of Microbiology and Immunology -IWK Health Centre. Halifax, Canada

Type of mobility: training
Duration: 01.07.2025-26.07.2025

Description of the activities:

Training Report

July 1 to July 26
Division of Immunology, Department of Microbiology and Immunology / Department of Pediatrics, IWK Health Centre

During the period from July 1 to July 26, I carried out a training internship under the supervision of Prof. Di Cara, an expert in molecular biology with a particular focus on peroxisomes. Prof. Di Cara's research involves the use of laboratory mice and Drosophila melanogaster as model organisms. The aim of my training was to imrove hands-on experience with *Drosophila*, which is extensively used in her lab to study peroxisomal dysfunctions.

I actively participated in the lab's daily routine and research activities. I contributed to the preparation of standard and enriched *Drosophila* culture media; the latter supplemented with specific molecules intended for testing in genetically engineered *Drosophila* models. These models developed and/or employed by Prof. Di Cara are characterized by the genetic induction of peroxisomal malfunction, specifically in the intestinal epithelium.

The use of these models allows for the investigation, at the molecular level, of metabolic and signaling pathways that may be disrupted (either upregulated or downregulated) in the course of disease, or potentially restored under specific treatment conditions.

As part of the experimental workflow, I was involved in the dissection of histological samples from *Drosophila* (specifically brains and intestines), which were then used—also by myself—for RNA extraction, followed by qPCR analysis and immunofluorescence staining (brain samples for confocal microscopy).

I was also assigned several *Drosophila* strains to expand and maintain, and I used them to set up genetic crosses aimed at generating progeny carrying specific genetic modifications. These included crosses such as mex>w1118, mex>GNPATi, and mex>Pex5i.

Some of these progenies were treated with olive pomace samples I brought from Italy, to assess potential rescue or modulation effects on the altered phenotypes. These experimental groups are currently under evaluation.

This experience has been extremely valuable, not only because it allowed me to compare laboratory procedures and approaches between our institutions, but also because I acquired new technical skills and knowledge—particularly in *Drosophila* handling, genetic crossing strategies, and histological sample

preparation. I sincerely hope this period of training and collaboration may be the beginning of a lasting scientific partnership, and perhaps lay the groundwork for future cross-Atlantic collaborations.

The undersigned Daniela Beghelli authorises the free use of the report and images to be used for information and advertising material by the University of Camerino through the website or social media. This authorization does not allow the use of the images or video footage in contexts that undermine the personal dignity and decorum of the undersigned and in any case for use and/or purposes other than those indicated above.

Place and date

Halifax, 27.07.2025

Signature