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GERLI
Strasbourg, France
Re: International GERLI PhD Prize

April 22, 2026

Dear GERLI board and scientific council,

I am pleased to submit this application based on my PhD dissertation focused on the formation and metabolism of nitrated fatty acids (NO₂-FAs) during acute inflammation. NO₂-FAs are endogenous electrophilic signaling mediators generated by metabolic activity, inflammation, and redox imbalance. While these non-canonical lipids have well-documented anti-inflammatory and cytoprotective properties, important gaps remain in the spatio-temporal formation and bioactivity of endogenous NO₂-FAs. While the chemical mechanisms governing NO₂-FA formation and outcomes of exogenous nitroalkene administration are relatively well characterized, the intimate relay by which these mediators form and activate differential signaling cascades are incompletely defined. Through my work, I found that phospholipids act as biochemical reservoirs, capable of accumulating nitro-conjugated linoleic acid (NO₂-CLA) in cell membranes and tissues. I further demonstrated that in rodents and humans, acute LPS-induced inflammation triggers a rapid release of NO₂-CLA that dampens pro-inflammatory responses. These findings redefine how NO₂-FAs are generated and function in vivo, bridging lipid metabolism, redox chemistry, and immune signaling. By identifying a transient, endogenous anti-inflammatory lipid reserve that becomes depleted during disease, this work highlights a potential therapeutic opportunity to restore NO₂-CLA levels and sustain the resolution of inflammation.

My research group maintains a distant connection to GERLI through my PhD advisor, Dr. Francisco Schopfer, who is a member of the EpiLipidNET COST Action and a subscriber to the GERLI newsletter, through which he received the call for this award. Unfortunately, while I did not have the financial opportunity to travel and participate in GERLI meetings, my work is closely aligned with the society's focus on lipid signaling and lipidomics. I have presented my research at both national and international conferences focused on free radical biochemistry, but not yet within a dedicated lipid-focused forum. The GERLI International Lipid Meeting represents an important opportunity to engage with a specialized community at the forefront of lipid research. As I to continue to work in lipidomics field, participation in GERLI activities would be highly valuable for establishing collaborations and integrating into the European lipid research community.

Thank you for your consideration.

Sincerely,

Nicole Colussi, PhD