



**University of Naples Federico II**  
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*International PhD course in*  
*Nutraceuticals, Functional Foods and Human Health*



**UNCOVERING THE IMMUNOMODULATORY ROLE OF TRPV3 AND THE THERAPEUTIC POTENTIAL OF ITS NATURAL LIGANDS IN INTESTINAL DISEASES**

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Transient Receptor Potential (TRP) channels are a family of ion channels involved in a wide range of physiological processes, including sensory perception and thermoregulation, and pathological conditions such as inflammation (Kalinovskii et al., 2023). Many natural ligands and food-derived compounds are known to activate or modulate specific TRP channel subtypes, including the TRPV3 (Kalinovskii et al., 2023; Li et al., 2025).

TRPV3 is a non-selective, calcium-permeable cation channel mostly expressed in skin keratinocytes. Emerging evidence suggests that TRPV3 may also play a key role in modulating immune functions related to intestinal homeostasis and inflammation. Notably, TRPV3 expression has been detected in peripheral blood mononuclear cells (PBMCs), with a significant reduction in PBMCs from patients with ulcerative colitis (UC) (Morita et al., 2020). Chronic intestinal diseases such as UC and colitis-associated cancer are characterized by persistent inflammation and dysregulated immune responses. Although reduced TRPV3 expression in PBMC of UC patients suggests a role in intestinal immune responses, its function remains largely unexplored.

This project aims to investigate the role of TRPV3 and the effect of its natural ligands in immune cell activation within the context of intestinal inflammation. For this purpose, experiments will be performed in: i) immune cells isolated from PBMCs of healthy donors and patients with intestinal inflammation, and ii) immune cells derived from the bone marrow of wild-type and *Trpv3* knockout (*Trpv3*<sup>-/-</sup>) mice. A panel of recently identified natural TRPV3 ligands (e.g., citronellal, linalool, citral) will be tested in these models to assess their effects on immune cell function. This approach will help clarify the physiological role of TRPV3 in the immune system and assess the potential effect of its natural ligands on the pathogenesis of intestinal inflammatory disorders.

## REFERENCES

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