**Tentative Outline (Preliminary Proposal of Thematic Issue)**

**Special/Thematic Issue for the journal Protein & Peptide Letters (PPL)**

# Lipid Droplet Proteome: the molecular players of cellular lipid storage

**Guest Editors:** Dr. Sara Missaglia

## Scope of the Thematic Issue:

Cytoplasmic lipid droplets (LDs) are dynamic organelles responsible for the storage of neutral lipids in eukaryotic cells. They are receiving an increasing interest from the scientific community especially because of their role in common and rare metabolic diseases (i.e. obesity, diabetes, lipid storage myopathy). The excess lipids accumulate in LD in different tissues, in particular causing fatty infiltration of skeletal muscle, heart, and liver. These are hallmarks of energy-overload diseases. Thus, understanding LD biology is essential to monitor fat storage in cells. Several proteins have been identified as LD-associated enzymes and their number has been increasing with proteomic study (i.e. perilipin, adipophilin, TIP47, OXPAT, caveolins, Rab proteins, CGI58, PNPLA proteins, lipid and protein kinases and phosphatases). These enzymes regulate assembly, fusion, and degradation of LD, resulting in the turnover of lipid components. Thus, LD neutral lipid core is surrounded by proteins with different functions. Some proteins play a key role in LD budding from endoplasmic reticulum lipid bilayers, and in LD-organelle interactions for fatty acid transport and lipid remodeling and homeostasis. Other proteins bind phospholipids and constitute the membrane which surrounds LD neutral lipid core. Finally, lipase action allows the mobilization of triglycerides. To date, the mechanisms which determine LD biology are only partially understood.

This Special Thematic Issue will resume our knowledge regarding which proteins are identified as LD-associated enzymes and how these molecules regulate lipid droplet formation and catabolism.

**Keywords:** Neutral lipids metabolism, Perilipins, PNPLAs, RAB proteins, Caveolins and Adipophilin.

## Sub-topics:

The sub-topics to be covered within the issue should be provided:

- Proteins involved in LD biogenesis
- LD catabolism mechanism
- Lipase activity
- Neutral lipid storage

## Schedule:

Complete Thematic issue submission deadline: 30$^{TH}$ June 2023.

## Details of Guest Editors:

Section Editor Name: Dr. Sara Missaglia
Affiliation: Università Cattolica del Sacro Cuore
Email: sara.missaglia@unicatt.it