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## Membrane lipidomics for personalized health

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Each organism and biological compartment has its own lipid composition, defined as the lipidome, which can be monitored by lipidomics. In particular, lipidomics revealed the precious information embedded in the correct assembly of phospholipids, to provide organization and functionality of the complex and homeostatic system of cell membranes at best. Membrane lipidomics is influenced by various metabolic and environmental conditions and the extreme flexibility of membrane composition for cell and tissue functioning is also the novel aspect that attracted a lot of research and medical interest. Our work translated this knowledge into a practical tool for personalized medicine, based on profiles determined from the mature red blood cell membranes. An innovative robotics was designed for high-throughput application of the analysis to the build-up of a human database, in order to understand how inadequate diets and life styles can perturb membrane lipidome and be connected with further disease onset. Lipidomic profiling evidences fatty acids changes and unbalances associated with diseases, such as dermatology, celiac disease and autism. It also evidences that membranes can be “repaired” from incorrect profiles by appropriate and personalized nutra-strategies, using the natural cell turnover and membrane remodeling processes. Nutrilipidomics proposes the joint venture from membranes and nutrition, used in health prevention and diseases, and in the latter case, coordinated with the therapeutic intervention. The effects of recovering the functional homeostasis in favor of better health and quality of life are nowadays a result of evidence-based medicine ready to be brought to a wide clinical use.

### Biography

Carla Ferreri holds the position of Senior Researcher at ISOF-CNR, Bologna (Italy). Her present research interests are in the field of free radical chemistry, biomimetic chemistry of stress conditions affecting the main biological molecules (lipids, DNA, proteins), membrane lipidomics, biomarker and novel nanotechnology development with application in life sciences, nutrition and molecular medicine. She is responsible of the CNR research project on lipidomics and nutraceuticals, co-founder of two spin-off companies in Italy and Greece, consultant for AZTI, a Spanish company on nutra-innovation, and author of more than 150 papers, 2 books and 3 patents.

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