

Carrer

Michele Fiore, born in 1977. After his master's degree, obtained in 2002, he worked in the field of food chemistry for two years. In 2007, he obtained his PhD at the University of Naples "Federico II" on the characterization and use of natural substances of agronomic interest. Post doc at the Department of Chemistry of the University of Ferrara (Italy) under the supervision of Professors Dondoni and Marra and then researcher at the start-up SienaBiotech (Siena, Italy) he was involved in a pharmaceutical chemistry project using "click" bio-orthogonal chemistry combinations for the preparation of bioactive substances against neurodegenerative diseases including glioblastoma, Alzheimer's and in particular Huntington's diseases. In 2012 Michele joined the team of Prof. Olivier Renaudet in Grenoble (Rhône-Alpes University) for a period of 40 months working on the chemistry of peptides, carbohydrates, glyco-peptides, glyco-clusters, lipids and glyco-polymers for the synthesis of vaccines and vaccine carriers with a total scientific production of 18 articles and several book chapters most of them as first author. In 2014, after recruitment by competition from the University of Lyon 1, he joined the ICBMS and the LCO2-Glyco-SysChem team currently led by Prof. P. Strazewski with whom he has collaborated since the beginning. At ICBMS Michele began working in the field of prebiotic Systems Chemistry, systems biology, organic chemistry and biochemistry aiming to contribute to understand how life emerged from an abiotic "soup" and how biotic molecules (ANR, DNA, peptides and proteins and finally phospholipids) evolved to assemble in prebiotic protocells.

Research

- Prebiotic chemistry of phospholipids
- Homochiral symmetry breaking of biotic molecules using chemical models
- Synthesis and use of clickable and modular dyes based on rhodamine, fluorescein and rhodol.
- Synthesis and use of glycolipids for the preparation of OMVs as vaccine carriers and their use in synthetic biology
- Preparation and use of glass and PLG tethered membranes
- Current internal collaborations : MEM group, GEMBAS group
- Current external collaborations : University of Salerno, Italy; University of Bari, Italy; University of Grenoble-Alpes;

Selected publications

Prebiotic chemistry and Life's origin

M. Fiore, *Editor*; Royal Chemical Society, London
(The Chemical Biology series) ISBN: 978-1-78801-749-7

Synthesis of Phospholipids Under Plausible Prebiotic Conditions and Analogies with Phospholipid Biochemistry for Origin of Life Studies.

Michele Fiore*, Carolina Chieffo, Augustin Lopez, Dimitri Fayolle, Johal Ruiz, Laurent Soulère, Philippe Oger, Emiliano Altamura, Florence Popowycz, and René Buchet; *Astrobiology*, 2022, Published Online: 23 Feb 2022 <https://doi-org.docelec.univ-lyon1.fr/10.1089/ast.2021.0059>

Chemical Analysis of Lipid Boundaries after Consecutive Growth and Division of Supported Giant Vesicles

A. Lopez, D. Fayolle, **M. Fiore***, P. Strazewski
iScience, 2020, <https://doi.org/10.1016/j.isci.2020.101677>

Glass Microsphere-Supported Giant Vesicles as Tools for Observation of Self-reproduction of Lipid Boundaries;

M. Fiore*, O. Maniti, A. Girard-Egrot, P-A Monnard and P. Strazewski
Angew. Chem. Int. Ed., 2018, 57, 282–286;

Racemic phospholipids for origin of life studies

E. Altamura, A. Comte, A. D'Onofrio, C. Roussillon, D. Fayolle, R. Buchet, F. Mavelli, P. Stano, **M. Fiore***, P. Strazewski
Symmetry 2020, 12, 1108; doi:10.3390/sym12071108
(2021 and 2022 Editor's Choice for Symmetry, MDPI)

Chromatophores Efficiently Promote Light-Driven ATP Synthesis and DNA 3 Transcription Inside Hybrid Multi-Compartment Artificial Cells

E. Altamura, P. Albanese, R. Marotta, F. Milano, **M. Fiore**, M. Trotta, P. Stano and F. Mavelli
PNAS, 2021 Vol. 118 No. 7 e2012170118
(1st Prize Cozzarelli Award 2022)