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Breaking Barriers in Chemical Biology – Toulouse 2022

Guest Editors



Marie Lopez obtained her PhD in chemo-enzymatic synthesis of oligosaccharides in 2007 under the supervision of Dr. H. Driguez and Dr. A. Buléon. In 2008, she joined Poulsen's group (GRIDD, Brisbane) as a post-doctoral fellow to work on glycosylated carbonic anhydrase inhibitors. In a second post-doctoral position, she worked on anti-tuberculosis agents in Montpellier before being recruited, in 2013, as a CNRS research scientist at the ETaC laboratory in Toulouse, directed by Paola B. Arimondo, to work on DNA methylation and its implication in cancers. In 2016, she moved to the IBMM in Montpellier, managing a research group working in chemistry, biochemistry and chemical biology to decipher and target epigenetic modifications in pathological contexts. Her projects consist in identifying new strategies to target epigenetic mechanism, i.e. multivalent, multifunctional and hybrid inhibitors, ProTaCs, peptide-based inhibitors and in developing affinity-based chemical probes to understand epigenetic mechanism

in diverse context, i.e. cancer, infectious diseases, invertebrate models. In 2020 she was elected as a member of the scientific board of the *Chémobiologie* group of the *Société Chimique de France* (SCF-ChemBio). Since 2021 she has been a member of the scientific committee of the ChemBio GDR.



Elisabetta Mileo is a CNRS researcher at the laboratory “Bioenergetique et Ingenierie des Protéines” (BIP) in Marseille. She is a chemist and a spectroscopist with experience in the synthesis and use of nitroxide radicals as spin probes and spin labels in supramolecular chemistry and applied to structural biology. She obtained her PhD in 2010 at the University of Bologna (Italy) under the supervision of Professor Marco Lucarini in the field of self-assembled supramolecular architectures investigated by Electron Paramagnetic Resonance (EPR) spectroscopy. During her PhD, she joined the group of Professor A. E. Kaifer, during 6 months (Miami, Florida) investigating the self-assembly of resorcinarene capsules. After a postdoctoral fellow in the group of Professor S. Marque (ICR, Marseille, France, 2010) working on the synthesis of new nitroxide-based spin labels for selective Tyrosine labeling, she joined the group of Professor B. Guigliarelli in 2012 at the BIP laboratory (Marseille, France) and her scientific interests shifted

towards the investigation of protein structural dynamics by Site-Directed Spin Labelling coupled to EPR spectroscopy (SDSL-EPR). In 2014, she obtained a full position as CNRS researcher (Marseille, France). Since 2014,

E. Mileo research activities are mainly focused on the investigation of protein structural dynamics, in particular in chaperones and other flexible proteins, with the objective of gaining information on how protein dynamics affects protein function. The originality of her work resides on the fact that protein investigation by SDSL-EPR is carried directly inside cells (in-cell EPR), in physiological conditions. Her studies are also aimed to the development of new tools and new spin labels to follow proteins “in action” by EPR directly into living cells.



After obtaining a PhD in Chemistry in 1989 at the University J. Fourier of Grenoble (UJF), **Eric Defrancq** realized a post-doctoral internship at the Institute of Chemistry of Neuchâtel (Switzerland) in the field of the chemistry of natural substances. In 1992, he was appointed lecturer at the UJF at the LEDSS and in 2004 he became a university professor. The common thread of his research is the Chemical-Biology. In this context, he carries out his research activities within the Department of Molecular Chemistry (DCM-UMR CNRS 5250) at the University of Grenoble Alpes and within the laboratory, he is the scientific coordinator of the Chemical Engineering of Nucleic Acids group. His research themes relate more particularly to the development of high-performance chemical methods for incorporating a motif into a nucleic acid (DNA or RNA) in order to provide it with new properties. In particular, in recent years, he has been interested in specific DNA structures: G-quadruplexes and i-motifs which constitute new biological

targets. In this context, he has developed an original concept (named TASQ for Template Assisted Synthetic G-Quadruplex) to constrain the topology of these tetrameric DNAs. These biomolecular systems are then used for the design and study of new photo-activable metal complexes targeting G-quadruplex DNA, the production of specific antibodies for G-quadruplex DNA and for the study of proteins interacting with these DNA. He is also director of the Institute of Molecular Chemistry of Grenoble (ICMG – UAR 2602) and scientific advisor to Hcéres.



Agnès Delmas, a pharmacist by training, is Director of Research Emeritus at the CNRS. Her scientific career, between chemistry and biology, was pursued at the Centre of Molecular Biophysics (Orléans), where she has promoted and structured a team focused on the chemistry of synthetic proteins. After two decades at the head of the peptide synthesis research group, she joined the NMR thematic group, which she led until 2020. Her role in facilitating collaborative research between the synthesis and NMR groups has highlighted the thematic axis focused on the synthesis and structural study of naturally occurring peptides/proteins rich in disulfide bridges. In addition to her scientific work, Agnès Delmas was the director of the doctoral school, of the Physics and Chemistry of Life federation and President of Section 16 of the CNRS, always seeking to promote research in chemical biology.



An alumnus of the Ecole Normale Supérieure in Paris, **Boris Vauzeilles** prepared his PhD under the supervision of Professor Pierre Sinaÿ in the chemistry department of this institution. He then joined Professor Julius Rebek, Jr. at MIT (Cambridge, Massachusetts), for a post-doctoral experience. The group soon moved to the Scripps Research Institute in La Jolla, where Julius Rebek was promoted to Director of the Skaggs Institute for Chemical Biology. Boris Vauzeilles then returned to France as a CNRS researcher (Institut de Chimie Moléculaire et des Matériaux d'Orsay, Université Paris-Saclay), and in 2012, in parallel to his research at Orsay, created a new team at the Institut de Chimie des Substances Naturelles à Gif-sur-Yvette, where he founded the Chemical Biology Department in 2015. He is also co-founder of a startup company, Diamidex, and received, with his group, the Prix La Recherche in 2015. His research is primarily focused on using synthetic chemistry to develop molecular tools to probe biological processes. Since 2020, he has been the director of the Institute of Chemistry of Natural Substances. He chairs the Chemical Biology Group

of the French Chemical Society (SCF-ChemBio), and is on the Board of Directors of the International Chemical Biology Society.



Dominique Guianvarc'h received a formation in Biochemistry and Organic Chemistry from the University Pierre et Marie Curie in Paris. She received her PhD in Organic Chemistry in 2001 under the supervision of Professor Jean-Louis Fourrey at the Institut de Chimie des Substances Naturelles in Gif sur Yvette (France) on C-nucleosides and nucleic acids chemistry. She then pursued a post-doctoral training in the laboratory of Biophysics of Professor Claude Hélène at the Museum National d'Histoire Naturelle in Paris on the development of oligonucleotide-conjugated topoisomerase inhibitors. In 2003, she was recruited as Associate Professor in the laboratory of Biomolécules founded by Professor Andrée Marquet at the University Pierre et Marie Curie. In 2007, she developed her own group devoted to the study of methyltransferases enzymes with chemical tools. In 2017, she was promoted Professor at the University Paris Saclay at the Institut de Chimie Moléculaire et des Matériaux d'Orsay (France). She is group leader of a

team in Bioorganic Chemistry with complementary skills in carbohydrate and nucleic acid chemistry, protein engineering and enzymology. Her research interests are in the areas of chemical biology including the development of chemical probes to understand different biological issues involving enzymes with potential applications in the field of health. In 2020, she was elected as board member and scientific secretary of the Chemical Biology Group within the French Chemical Society. Since 2021, she has been deputy director of the CNRS french research consortium in Chemical Biology (GDR-ChemBio). She is strongly involved in trainings with interdisciplinary programs and created a CNRS Thematic School of Chemical Biology in 2021.



Christophe Biot obtained his PhD in bioorganometallics in 1998 under the supervision of Pr. J. Brocard. Following several post-doctoral positions, he joined the University of Lille as an assistant professor in 2004. He is currently a Professor and leads the Chemical GlycoBiology (CheGB) team at the Unity of Structural and Functional Glycobiology. The team comprises scientists with diverse expertise ranging from organic synthesis to cell biology, and their research topics encompass a broad range of significant areas in chemical biology. Biot has published more than 130 research articles and 15 book chapters. Christophe Biot is the director of the GDR ChemBio.