

The Pharmaceutical and Bio-Imaging Potentials of CORMs: from Academia to Applications



Prof. Fabio Zobi
Inorganic Gasotransmitters Laboratory
Department of Chemistry,
University of Fribourg
Switzerland

Carbon monoxide releasing molecules (CORMs) are an emerging class of pharmaceutical compounds which are intended to specifically deliver carbon monoxide (CO) to diseased or inflamed tissues in order to initiate and promote therapeutic effects at the site of disease. The diatomic molecule plays a crucial role as a gasotransmitter and when exogenously applied it mediates a therapeutic effect in different pathologies including cancer, neurodegenerations, hypertension, heart diseases, liver disfunctions, inflammation and infections. Currently CO and CORMs are evaluated in several clinical trials (Phase I-III).

As the vast majority of CO-releasing molecules are based on transition metal complexes, our research efforts are aimed at rendering CORMs more biocompatible. From a technological point of view, the distinctive physicochemical features of CORMs (coupled with advances in vibrational microscopy techniques) may revolutionize the way in which we are able to visualize cellular structures and dynamic processes in real time. Indeed when CORMs (and related organometallic species) are exposed to an electromagnetic radiation of suitable energy, the bound CO group will resonate in the water-transparent region of the vibrational spectrum. This diagnostic region has allowed us to develop new approaches for the 3D morphological distribution and localization of CORM species within tissues and single cells and to correlate specific chemical vibrational fingerprints to subcellular structures in complex cellular topography.

Curriculum Vitae

Fabio Zobi was born in Italy in 1976 and studied chemistry at the York University (Toronto, Canada) where in 2001 he received a Master degree working in the group of Prof. Dennis V. Stynes. He then moved to Zürich where in 2005 he obtained his PhD under the direction of Prof. Roger Alberto on a project aimed at elucidating the interaction of radioactive metal ions with DNA. He then spent nearly two years as postdoctoral fellow in the group of Peter J. Sadler at the University of Edinburgh. In 2007 he moved back to the University of Zürich where two years later began his independent research carrier as a Swiss National Science Foundation fellow. Since July 2013 he is an Associate Professor at the University of Fribourg (CH). Fabio Zobi's research interests are diverse covering different topics in inorganic and medicinal chemistry and bio-imaging. He acts as an expert reviewer for Swiss National Science Foundation and the National Research Foundation of South Africa. He holds 3 patents, and he is first or corresponding author of ca. 40 original papers.