**Chemical and Theoretical Approaches to the Synthesis and Development of Rhenium Carbonyl Antibiotic**

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**Abstract**

Organometallic compounds are increasingly recognized as promising anticancer and antibiotic drug candidates. Among the transition metal ions investigated for these purposes, rhenium occupies a special role. Its tricarbonyl complexes, in particular, attract continuous attention due to their relative ease of preparation, stability and unique photophysical and luminescent properties that allow the combination of diagnostic and therapeutic purposes, thereby permitting, e.g., molecules to be tracked within cells. In this lecture, we discuss the development and properties of antibiotic rhenium tricarbonyl complexes described in the last seven years, mainly in terms of their structural variations and in vitro efficacy, but with a focus on the rational chemical and in silico approaches we undertake for their design.