

Intitulé du Sujet de Thèse : Metal complexes for cancer therapy: tracking and unraveling their biological action in the intracellular space

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Descriptif du projet

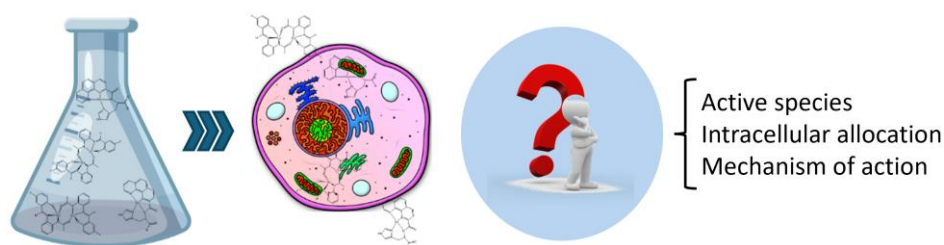
Context

Cancer is a significant health problem, accounting for nearly 10 million deaths and 20 million new cases in 2022. Global estimates project approximately 35 million new cases annually by 2050.[1] Metal-based chemotherapeutics such as cisplatin, carboplatin and oxaliplatin are widely employed in cancer treatment. However, their effectiveness remains limited by significant side effects. In this context, metal complexes bearing physiological metals have emerged as promising alternatives.

Objectives

In this landscape, we have developed several families of copper complexes exhibiting significant cytotoxicity against cancer cells.[2] Using the knowledge gathered, the present project aims to combine coordination chemistry, organic and peptide chemistry, molecular imaging, omics approaches (i.e. proteomics and metabolomics) [3] and cell-based studies to:

- Develop new metal complexes (primarily copper-based) with cancer therapeutic potential
- Elucidate their intracellular fate and mechanism of action in tumoral cells. This knowledge remains largely lacking for most metal-based drug candidates, which constitutes a major bottleneck hindering their progression toward clinical trials in inorganic medicinal chemistry.



Profile of the candidate

Master's degree in chemistry or chemical engineering.

Background in organic and/or peptide synthesis.

Knowledge in medicinal chemistry, drug design, toxicology and/or cells studies would be appreciated.

Références Bibliographiques

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- [3] A.A. Saei, C.M. Beusch, A. Chernobrovkin, P. Sabatier, B. Zhang, Ü.G. Tokat, E. Stergiou, M. Gaetani, Á. Végvári, R.A. Zubarev, *Nat. Comm.* 2019, 10, 5715, DOI : [10.1038/s41467-019-13582-8](https://doi.org/10.1038/s41467-019-13582-8).