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New polymeric "ruthenium-cyclopentadienyl" complexes for drug delivery in cancer therapy

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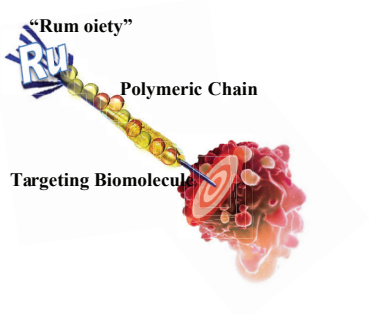
One of the main problems associated with chemotherapy is the high noxious side effects caused by the lack of selectivity, i.e., the drugs are not specific to the cancer cells. The ideal situation is to achieve a high degree of selectivity where the drug might be only delivered to the tumour without affecting the healthy tissues. In this frame, polymeric metal complexes (PMCs) put forward an important contribution to the drug-delivery research in cancer therapy, using polymers as drug carriers. The great advantage is the easier accumulation of polymers in the cancer cells relatively to single molecules (usual drugs), improving the concentration of the drug and thus its efficiency, which will consequently allow to significantly decrease the side effects.

Here we will present the organocatalyzed synthesis and performances of new PMCs of the general formula [RuArLP]+ (Ar=arene, L=heteroaromatic bidentate macroligand and P=coligand), charged with our new emerging ruthenium compounds already recognized as an efficient cancer cell killers. Importantly, our polymers are designed in order to be guided by specific target vectors to efficiently reach the cancer cells. This feature of our new PMCs can also be the key to overcome the toxic side effects of chemotherapy caused by the existing drugs for chemotherapy. The IC50 values in several cancer cell lines, together with a pH dependent hydrolysis in some cases suggest high potentialities for the application of RuPMCs as new drug delivery systems for RuIICp compounds.



Biography

Andreia Valente is graduated in Technological Chemistry from the Faculty of Sciences, University of Lisbon, Portugal. She continued her studies in this institution, where she got her Master degree in Biomedical Inorganic Chemistry. Then, she joined the Unity of Catalysis and Solid State Chemistry at Lille I University, in France, where she obtained her Ph.D. in 2010 in the field of Polymerization Catalysis. Then she joined the Organometallic Group from the Center for Molecular Sciences and Materials at the University of Lisbon where she is now a postdoctoral researcher in the field of polymeric metal complexes for biomedical applications, in cancer therapy.

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