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Ruthenium drugs for cancer therapy: Small structural changes, different *in vivo* performances

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In the recent years our group has been involved in the synthesis of new ruthenium organometallic complexes which cytotoxicity against several cancer cell lines was found, in most of the cases, better than that of cisplatin. In particular important IC50 values were found for the triple negative breast cancer (TNBC) and prostate cancer cells when treated with compounds which structures are based in the fragment "Ru(η5-C5H5)" with two different appended molecules. Thus, three compounds of the panel were selected having in mind to understand any possible correlation between chemical structure and *in vitro* / *in vivo* activity. The main structural changes were the replacement of N,N by a N,O heteroaromatic ligand or inclusion of a sulphonate group in the phosphane ligand in order to increase water solubility. Although our *in vitro* studies such as cellular distribution, morphological alterations caused by drugs, binding to serum proteins, between others, revealed very similar responses for our selected drugs, their behavior *in vivo* was completely different. While the therapeutic effect of one of these compounds evaluated in an orthotopic TNBC mouse model demonstrated the capacity to suppress tumor growth, not presenting the severe side-effects of other non-targeted chemotherapeutic agents, this was not the case of the other two compounds tested for prostate cancer. In fact, severe side effects were observed in the animals for one of the drugs while the other drug was excreted without exerting any effect neither in the animal nor in the tumor.

Biography

M. Helena Garcia, is Associate Professor with "Habilitation" at University of Lisbon. Her scientific areas of research have been mainly centered in synthesis of organometallic compounds in view to potential applications with benefit to the society. She authored over one hundred publications and fifty invited lectures and oral presentations. M. Helena Garcia has been leader of several national and European funded scientific research projects and is Member of the "Division of Organometallic Chemistry" of European Association for Chemical and Molecular Sciences, as delegate of Portuguese Chemical Society, since 1992. She is Coordinator of the International Office at Faculty of Sciences of University of Lisbon.

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