Organometallic compounds as potential anti-cancer agents. Towards targeted therapeutics

María Contel
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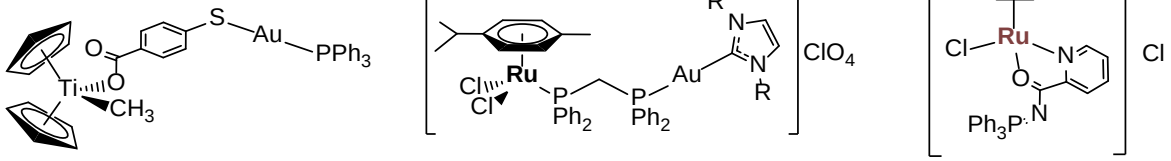
This seminar will cover recent research of our group in the area of medicinal inorganic chemistry. More specifically this seminar will focus on cancer research (synthesis of potential metal-based chemotherapeutics for renal and breast cancers).

Our group at Brooklyn College has recently reported on the preparation of heterometallic complexes containing titanocenes[1-4] [$TiCp_2$] or ruthenium(II) arene derivatives[5] [Ru(p-cymene)Cl_2(dppm)] and gold(I)-phosphane (**a**) or gold(I)-NHC fragments (**b**) and their potential as chemotherapeutics against renal or colorectal cancers (including *in vivo* studies[2,3]). I will report here on new detailed *in vivo* studies of selected Ti-Au and Ru-Au derivatives as well as mechanistic studies for renal cancer.

In addition, I will describe the properties (*in vitro* and *in vivo*) of ruthenium iminophosphorane compounds (suc **c**) with potential as a chemotherapeutics for triple-negative breast cancer[6,7] and strategies to improve the delivery of these type of compounds via peptide-based nanocarriers that can be cleaved by the MMP-9 enzyme overexpressed in breast cancer.

Finally, I will also describe preliminary synthetic efforts to coordinate cytotoxic gold(I)-NHC fragments (NHC= N-heterocyclic carbene ligands) to linkers amenable to bioconjugation with monoclonal antibodies for the subsequent preparation of antibody-drug conjugates to target highly malignant breast cancers overexpressing HER2.



a **b** **c**

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Maria CONTEL is a Professor and Chairperson of the Department of Chemistry, Brooklyn College, The City University of New York (CUNY), where she has been for almost 11 years. She received her PhD in chemistry from the Public University of Navarra, Spain (in collaboration with the University of Zaragoza) in 1996. After two postdoctoral positions at the Research School of Chemistry, Australian National University, Canberra, Australia and the University of Utrecht in the Netherlands, she was awarded a Senior Research Fellowship "Ramon y Cajal" (University of Zaragoza, Spain) in 2002. This is the most prestigious 5-year fellowship for young investigators in Spain.

She joined Brooklyn College and the Graduate Center, CUNY in 2006 as an Assistant Professor in Inorganic Chemistry. In 2011, she became an Associate Professor, and in 2016, she was promoted to a full professorship in the same university. In 2014 she became a faculty member of the CUNY Graduate Center in the PhD Biology Program (she was a faculty member of the Chemistry Program since 2006). She is also a Member from the University of Hawaii Cancer Center (a National Cancer Institute designated Center) since 2014.

Her research program focuses on the synthesis and characterization of transition-metal complexes and their applications as anticancer and antimicrobial agents and as catalysts in reactions of industrial interest. She has published 55 articles, two book chapters and has two recent US patents issued. Since arriving in the US she has secured over $2 M in grants from the National Institutes of Health and grants from her University. In 2015 she was awarded a Tow Professorship, the most important scholar award at Brooklyn College. Her research has always been accompanied by a strong mentoring component (particularly of undergraduate students and of female and other underrepresented groups in the physical sciences).