

# Synthesis of novel ligands for the stabilization of organometallic complexes having potential antitumor activity

A. Caporale<sup>1</sup>, A. Mariconda<sup>2</sup>, G. Palma<sup>3</sup>, P. Longo<sup>2</sup>, C. Arra<sup>3</sup>, M.S. Sinicropi<sup>4</sup>, F. Di Cristo<sup>1</sup>, A. Capasso<sup>1</sup>, C. Saturnino<sup>1</sup>

<sup>1</sup>Dept. of Pharmacy, University of Salerno, Via Giovanni Paolo II 132, 84084, Fisciano (SA), Italy

<sup>2</sup>Dept. of Chemistry and Biology, University of Salerno, Via Giovanni Paolo II 132, 84084, Fisciano (SA), Italy

<sup>3</sup>IRCCS (National Cancer Institute, IRCCS, 'G. Pascale' Foundation), Via Mariano Semmola, 52-108, 80131, Naples, Italy

<sup>4</sup>Dept. of Pharmacy, Health and Nutritional Sciences, University of Calabria, Arcavacata's Campus, via Pietro Bucci, 87036 Arcavacata di Rende (CS), Italy

Recently group III and IV metal complexes have been reevaluated as antitumor therapy drugs. Many complexes of titanium and lanthanides showed significant biological activity and progressed into clinical trials.<sup>[1-4]</sup>

Because of these good biological results, we decided to synthesize structural analogs of titanocenes with group III metal. In this regard, we synthesized novel scandium, yttrium and neodymium complexes.

We tested complexes on DU146 (Prostatic carcinoma) and MDA. MB213 (Breast cancer) to verify if they could inhibit tumor cell-growth. Measurement of cell-line viability was evaluated toward MTT test following standard procedures. The reduction in growth showed a concentration-dependent activity on both cell lines even at a 5  $\mu$ m concentration.

So, most of complexes demonstrated an effective ability of inhibiting the tumor cell growth, referring to antiproliferative activity.

## References

1. Melendez, E. Titanium complexes in cancer treatment. *Critical Reviews in Oncology/Hematology*, **2002**, *42*, 309-315.
2. Fricker, S.P. The therapeutic application of lanthanides. *Chemical Society Reviews*, **2006**, *35*, 524-533.
3. Napoli, M.; Saturnino, C.; Sirignano, E.; Popolo, A.; Pinto, A.; Longo, P. Synthesis, characterization and cytotoxicity studies of methoxy alkyl substituted metallocenes. *European Journal of Medicinal Chemistry*, **2011**, *46*, 122-128.
4. Sirignano, E.; Botta, A.; Saturnino, C.; Sinicropi, M.S.; Caruso, A.; Pisano, A.; Lappano, R.; Maggiolini, M.; Longo, P. New titanocene derivatives with high antiproliferative activity against breast cancer cells. *Bioorganic & Medicinal Chemistry Letters*, **2014**, *24*, 136-140.