**New use of metals as nano-sized radiation enhancers**

Agnès Pottier1\*, Elsa Borghi1, Laurent Levy1

1 *Nanobiotix, France*

[agnes.pottier@nanobiotix.com](mailto:agnes.pottier@nanobiotix.com) +33 (0)1 40 26 04 70

**Abstract**

Since the discovery of cisplatin about 40 years ago, the design of innovative metal-based anticancer drugs is a growing area of research. Metal elements offer specific characteristics due to their intrinsic properties and could be used in relation to their final state: a metal complex, a radionuclide, a metal-based nanoparticle product. Transition metal coordination complexes interact with cell molecular targets, affecting biochemical functions resulting in cancer cell destruction. Radionuclides are another way to use metals as anticancer therapy. The metal nucleus of the unstable radionuclide becomes stable by emitting energy. The biological effect in different tissues is obtained by the absorption of this energy from the radiation emitted by the radionuclide, the principal target generally agreed for ionizing radiations being DNA. A new area of clinical research is now emerging using the same experimental metal elements, but in a radically different manner: metals and metal oxides used as crystalline nanosized radiation enhancers particles. The use of metals as a high electron density material tailored at the nanoscale when exposed to radiotherapy is a unique approach that can allow entry to the cell and make feasible the absorption/deposition of a high-energy dose within the tumor cell (on/off activity). Therefore, high electron density metal or metal oxide nanoparticles may bring well known physical mode of action, that of radiotherapy, within malignant cells and achieve the paradigm of local cancer treatment.

**Biography:**

Dr. Agnès Pottier holds a Ph.D. in inorganic chemistry, from the Pierre and Marie Curie University (France). From 2000 to 2006, she worked for Rhodia R&D on the development of innovative nanomaterials for various applications such as polymer reinforcement. She was also the technical project manager for an international project up to industrialization. In 2006, she joined the Rhodia Energy Group to run industrial projects according to six sigma methodology. Her expertise was organic/inorganic synthesis and polymers/nanoparticles interface.

She is inventor of several patents applications and patents. She joined Nanobiotix in 2007 as a manager of research and intellectual property.