

**Using magnetic nanoparticles and high/low frequency magnetic fields to destroy cancer cells:  
Looking for a candidate for the CNRS national contest**

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**Scientific context**

Magnetic nanoparticles (MNPs) have currently many applications in biomedicine: they are used for imaging, to improve gene transfection, for bio-separation and for tissue engineering. With respect to cancer therapy, different ways to kill tumour cells using magnetic nano-objects have been reported. The most studied so far is magnetic hyperthermia, which consists in rising the temperature of a tumour using MNPs injected intra-tumorally. MNP heating is induced by the application of high-frequency magnetic fields. More recently, the destruction of cell membranes using the motion of magnetic disks or nanoparticles bound to them using slowly varying magnetic fields have been reported. Since then, several groups have shown that MNPs can also be used to induce cell death using such low-frequency magnetic fields. The LPCNO has been very active in these fields of research, and made significant contribution in physics, chemistry and biology.

**Position**

Our objective is to present a candidate to the national CNRS contest in a commission dedicated to projects at the physics/biology interface. If the candidate succeeds to the contest, he/she will get a permanent position and will be integrated in the “Nanomagnetism” of the LPCNO. He/she will take in charge research topics at the interface between nanomagnetism and cancerology. In particular, he/she will work in close collaboration with biologists (Véronique Gigoux, 's team) and chemists (Bruno Chaudret's group) of the LPCNO.

**Profile**

- Ideally, the candidate should be a physicist with good background in magnetism, and should have already worked extensively with biologists. A candidate who has previously worked on magnetic hyperthermia would be ideal but this is not mandatory.
- The candidate should have spent at least one or two years of post-doc in a laboratory different from his/her PhD.
- The candidate should have excellent publication tracks.
- The candidate will have to write a high-quality proposal about his/her project inside the laboratory, so good writing skills are required.
- The candidate should know that chances of success are in principle not very high, but can become significant if all the conditions above are fulfilled.

**Application**

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