

Synthesis and Application of New Drug Delivery Systems based on Iron-oxide and Nobel metals Nanoparticles

POSITION TITLE: **RESEARCH ASSISTANT***

***THIS POSITION WILL BE A JOINT POSITION BETWEEN THE GROUPS OF PROFESSOR ALI TRABOLSI AND PROFESSOR MAZIN MAGZOUB AT NYUAD.**

RESEARCH PROJECT TITLE: **SYNTHESIS AND APPLICATION OF NEW DRUG DELIVERY SYSTEMS BASED ON IRON-OXIDE AND NOBEL METALS NANOPARTICLES**

FACULTY NAME & TITLE: **ALI TRABOLSI, ASSISTANT PROFESSOR IN CHEMISTRY, MAZIN MAGZOUB, ASSISTANT PROFESSOR IN BIOLOGY**

RESEARCH PROJECT DESCRIPTION

The focus of the project is on the development of a novel therapeutic nanoplatform, Targeted Chemotherapeutic Nanoparticles (T-CNPs), for the diagnosis and treatment cancer. The T-CNPs will be composed of iron oxide NPs that are:

- i) functionalized with water-soluble organic nanocontainers, for the encapsulation of a combination of hydrophobic and/or hydrophilic drugs that can act synergistically;
- ii) conjugated to cell-penetrating peptides (CPPs) – either directly, or through encapsulation of the NPs within polyethylene glycol-modified liposomes (to avoid immune recognition) that are surface-coated with CPPs – which will enhance specific targeting of tumors and internalization into cancer cells.

The aim is to use the nanoplatform to simultaneously target a tumor, monitor it by magnetic resonance imaging (MRI), and treat the disease by controlling the gradual release of the delivered anti-cancer drugs using a non-invasive external stimulus, which will concurrently induce hyperthermia. We will highlight new ways for the active release of the drugs, particularly by an external magnetic field, and promote the understanding of complex *in vivo* phenomenon when the molecules are optimally delivered.

RESPONSIBILITIES OF THE POSITION

- Conduct research in the area of nanoparticles (synthesis, surface functionalization and characterization)
- Conduct experiments using host-guest chemistry
- Cell culture

- Conduct experiments in the field of drug delivery, including cell viability/toxicity assays and high resolution imaging

ESSENTIAL QUALIFICATIONS:

- Bachelor of Science majoring in Chemistry/Biochemistry/Biology
- Experience in organic synthesis, general chemistry, or cell/molecular biology
- Excellent communication skills

PREFERRED EXPERIENCE / SKILLS:

In addition to the necessary knowledge of science and chemistry/biology, a research chemist/biologist must be curious about the natural world and the ability to come up and develop new experiments. He/she will be required to work and collaborate with other scientists within the group as well as from different fields. This ability to work in a team setting and communicate with others is very important. Lab research work experience is an asset.

APPLICANTS TO PROVIDE:

1. Statement of interest in the position
2. Transcript of degree(s)
3. CV
4. Two letters of recommendation