**Recruitment: Candidate for MSc/ PhD/ Research Assistant**

**PROJECT DETAILS**

**Title:**

Novel AuNP-{-linker-[Zn(II)(FL-ligand)(aa)x](NO3)m}n conjugates: synthesis, characterization and factors affecting their properties

**Project Description:**

Nanogold particles (AuNP) and their conjugates have potential use as contrast agents, fluorescence imaging, nanosensors, drug-carriers and targeted delivery, and anticancer-nanomedicinal therapy. This project investigates a series of novelAuNP-{Linker-[Zn(II)(FL-ligand)(aa)x](NO3)m}n conjugates (FL-ligand = fluorescence ligand highly selective towards zinc(II); x = 0,1; m = 0,1; n = number of bound zinc(II) complex; aa = L-cysteine or other amino acid) to understand factors influencing their properties. Zinc ion, with d10 configuration, is known to greatly enhance FL emission of ligands or ligands with poor FL emission when they are coordinated to zinc. Optical properties of AuNP are also tunable, and is affected by size, shape and structure. Conjugating FL-zinc complex or potential anticancer zinc complex to AuNP usinglinkers with bifunctional groups (e.g. HSCH2CH2CH2CH2NH) can yield unique dual emissive materials for ratiometric sensing, cellular-tissue imaging and nanomedicine. How these two components (AuNP and Zn(II)-complex) affect each other’s light absorption and FL emission upon conjugation is unknown. Not much is also known about how the FL emission of a fluorophore is quenched or enhanced when near a metal nanoparticle. When the FL-ligand is a DNA-intercalating, polypyridyl ligand (e.g. phen, chrys), our research shows the resultant zinc(II) complex can have anticancer property. Conjugating such zinc complexes to AuNP can give rise to unique, multiple-targeting anticancer agents (i) with enhanced permeability and selective cellular uptake, and  (ii) with strong self-emitting FL to track their cellular location and distribution. In fact, reports on the interactions between AuNPs and tissue at the cellular, intracellular and molecular levels are still poorly understood. The above AuNP-linker-(Zn(II)-complex) conjugates will be characterized by FTIR, UV-visible spectroscopy, FL spectroscopy, zetasizer, AFM and SEM.  Their permeability, cellular uptake, anticancer activity and cellular imaging will be studied by using Caco-2 cells grown on Trans-well plates, ICP-MS, MTT assay, and various microscopic techniques.

**Scholarship/Stipend:** RM 1500 – RM 2000

**Entry requirement:**

* Hons. Degree in Chemistry/Chemistry-Biology/Biological Chemistry/ Pharmaceutical Chemistry/Medicinal Chemistry. The candidate will be required to register for postgraduate studies (MSc or PhD).
* Have commitment and passion toward research.
* Willingness to work hard and learn new things/concepts, independent.
* Good communication skills and able to interact well with other people.

**Duration:** 2 to 3 years

**Commencement date of the project:** Immediate

**HOW TO APPLY**Interested candidates can contact Assoc. Prof. Dr. Ng Chew Hee, (ngchewhee@imu.edu.my) for further details. Alternatively, you may call 03- 2731 7483 ext 2732 directly at 012-671 3343.