

## Dendritic cells stimulated by cationic liposomes prepared *via* the ethanol injection method

Micaela Tamara Vitor<sup>1</sup>, Bergami-Santos P. C<sup>2</sup>, Barbuto J. A. M<sup>2</sup> and De La Torre L. G<sup>1</sup>

<sup>1</sup>University of Campinas (Unicamp), Brazil

<sup>2</sup>University of São Paulo (USP), Brazil

Cancer is a disease that afflicts mankind, hence many treatments are being employed to combat it, such as surgery, radiotherapy, chemotherapy and more recently, biological therapy emerges as a promising technique. Immunotherapy is a branch of biological therapy, which attempts to exploit the immune system to detect and destroy cancer cells. For that, patients' T lymphocytes must be presented to antigens by activated dendritic cells (DCs) loaded with tumor antigens, which can be delivered by cationic liposomes. We showed that cationic liposomes composed by egg phosphatidylcholine (EPC), 1,2-dioleoyl-3-trimethylammonium propane (DOTAP) and 1,2-dioleoylphosphatidylethanolamine (DOPE) complexed with hsp-65-DNA have low cytotoxicity *in vitro* and, used as nucleic acid delivery system in the intranasal route, a potential role as a tuberculosis vaccine. Here we investigate the effects of similar cationic liposomes upon dendritic cells differentiation/maturation *in vitro*. We developed cationic liposomes EPC/DOTAP/DOPE (50/25/25% molar) prepared via the ethanol injection method (ST-liposomes) (94% of the population with diameter of  $85 \pm 5$  nm and polydispersity of 0.54) and the same liposomes followed by microfluidization (SM-liposomes) (99% of the population with diameter of  $40 \pm 14$  nm and polydispersity of 0.40). Afterward, these cationic liposomes were *in vitro* evaluated for their ability to stimulate dendritic cells differentiation/maturation. The phenotypic analysis of DCs was performed by flow cytometry and showed that both cationic liposomes were incorporated and activated DCs. These results demonstrate the ability of cationic liposomes to active DCs *in vitro*, which could be used as a potential tool in further strategies in cancer immunotherapy.

### Biography

Micaela Tamara Vitor has graduated in Food Engineering from Federal University of Viçosa in 2005. Currently, she is a Ph.D. student at University of Campinas, where she develops nanoparticles to gene delivery *in vitro* for mammalian cells. Recently, she published a review article of her research group, in the field of nanobiotechnology, in collaboration with a group of immunologists from University of São Paulo.

micaelatamaravitor@gmail.com

## Facile direct formation of ZnO nanoparticles from a Zn(II) coordination polymer derived from 5-(3-pyridyl)-1,3,4-oxadiazole-2-thiol and benzimidazole

Maged S. Al-Fakeh, Aref A. M. Aly and Mahmoud A. Ghandour

Assiut University, Egypt

We report on a nano coordination polymer of Zn(II) derived from 5-(3-pyridyl)-1,3,4-oxadiazole-2-thiol (POZT) and benzimidazole (BIMZ). It was prepared, characterized and used as a precursor for zinc oxide nanoparticles (ZnO NPs) by calcination. The coordination polymer was characterized by elemental analysis, IR an UV-visible spectra fluorescence technique, X-ray powder diffraction analysis (XRD), scanning electron microscopy (SEM) and transmission electron microscopy (TEM). Thermogravimetry (TG), derivative thermogravimetry (DTG) and differential thermal analysis (DTA) have been used to study the thermal decomposition steps and to calculate the thermodynamic parameters of the nano-sized metal coordination polymer. The kinetic parameters have been calculated making use of the Coats-Redfern and Horowitz-Metzger equations. The polymer and zinc oxide possess a nanoparticle size of 20 and 34 nm, respectively. The biological activity of the coordination polymer was tested against five bacterial and six fungal strains.

maged7969@yahoo.com