on nanocarrier-protein and protein-protein interactions and their effect on the response of model cellular systems and intact cells.

NANOPARTICLES IN MOLECULAR IMAGING

PABLO CABRAL

Center for Nuclear Research (CIN). Science Faculty. Montevideo, Uruguay.

The advent of molecular imaging has led to unprecedented progress in non-invasive visualization, characterization and quantification of biological processes at molecular and cellular levels. Multifunctional nanoparticles for multimodal images and theragnosis are being developed. Nuclear medicine imaging, particularly positron emission tomography (PET) and single photon emission computed tomography (SPECT), has played a crucial role in the development of molecular imaging. With the advantage of high sensitivity, PET and SPECT images can offer physiological, metabolic and functional information. The hybrid imaging techniques developed PET/MR, PET/CT, SPECT/CT and SPECT/Fluorescence have gained wide acceptance as powerful tools in basic research and clinical applications. However, few new imaging agents have been provided for clinical purposes during the last decade, in particular, multifunctional radiolabeled agents for these hybrid imaging techniques. Therefore, current research efforts mainly focus on the development of multifunctional image probes in this field.

NEBULIZABLE ARCHAEOLIPID NANOVESICLES FOR DRUG DELIVERY TO THE LUNGS

JULIA ALTUBE

Center for Research and Development in Nanomedicines, National University of Quilmes. Buenos Aires, Argentina.

To improve safety and efficacy in the treatment of lung diseases like asthma and lung infection, medications are routinely inhaled rather than administered systemically. Inhaled medication can achieve the same effective concentration in lungs at doses lower than by oral or intravenous routes. Moreover, the efficacy of inhaled medication can be enhanced by performing targeted delivery to selected body sites, with tailored nanoparticulate carriers. Inhaled nanoparticles preferentially accumulate in lungs, thus limiting drugs penetration into the bloodstream, consequently decreasing adverse systemic side effects. Inhaled nanoparticulate medication, however, needs to overcome some critical drawbacks. Firstly, nanoparticles must to withstand the physical stress produced by the nebulizer forces, and to surpass the barriers imposed by the lung morphology. Secondly, nanoparticles must avoid the trapping into the mucociliar escalator, being free to cross the surfactant layer covering the alveolar epithelium. Thirdly, safety issues related with lung epithelium integrity must be evaluated. This presentation will describe the performance of nebulizable nanovesicles, as delivery systems for antibiotics or anti-inflammatory drugs to the lungs, on *in vitro* models of mucus and surfactant layers and of inflamed alveolar epithelium in an air-liquid interface. The advantages of these novel nebulizable nanovesicles made of archaeolipids extracted from the cellular membrane of archaebacterias will be analyzed in comparison with conventional inhaled liposomes.

Short talks of Nanomedicine selected posters:

0757 - DENDRITIC CELL TARGETING IN CULTURED FISH IN ARGENTINA FOR VACCINE DEVELOPMENT

Federica GHERSA (1) | Ivana SORIA(2) | Valeria QUATTROCCHI(2) | Mariela GAMMELLA(2) | Cecilia Ana LANGELLOTTI(2) | Patricia ZAMORANO(2) | Carlos Alejandro RAUQUE(1) | Juan Sebastina PAPPALARDO(3)

INSTITUTO DE INVESTIGACIONES ES BIODIVERSIDAD Y MEDIOAMBIENTE (INIBIOMA-CONICET) (1); INSTITUTO DE VIROLOGÍA E INNOVACIONES TECNOLÓGICAS (IVIT, CONICET-INTA) (2); INSTITUTO FORESTAL AGROPECUARIO (IFAB- INTA CONICET) (3)

Abstract/Resumen: Aquaculture is a fast-developing sector in the food industry worldwide. In Argentina two main species present an important economic value, these are Pacú (Piaractus mesopotamicus, Pm) and Rainbow Trout (Oncorhynchus mykiss, Om). Due to stress and changing environmental conditions cultured fish are exposed to, the use of antibiotics has become a common solution for treatment and avoidance of disease. This practice presents several problems such as overdose, contamination and resistance generation. The development of effective and affordable vaccines is necessary for aquaculture in order to produce safe products for consumption and the environment. This work focuses on the evaluation of a species unspecific nanovaccine platform in Pm and Om, composed of liposomes decorated with a1,2-mannobiose, a specific disaccharide that targets DC-SIGN receptor, mainly expressed on dendritic cells (DC). We cultured DC obtained from head kidney (HK), of Pm and Om in complete D-MEM (10 % FBS) for 1, 7 and 14 days at room temperature (RT) in order to obtain non-adherent cells, enriched in DC. These cells where later incubated for 30 m or 12 h at RT in D-MEM without FBS with undecorated liposomes for unspecific cell targeting (plain-L), a1,2-mannobiose decorated (Mana-L) and DOTAP (DOTAP-L) liposomes as a positive control, all marked with rhodamine. Prior liposome formulation and characterization with Z sizer was done. Incubation was stopped adding complete D-MEM. Cells were washed and fixed with PFA at 0.02 % w/v final concentration and then analyzed by flow cytometry. Results were statistically analyzed with two-way ANOVA followed by Bonferroni's Test. Results demonstrate that HK cultures at day 7 and 14 are enriched in DC-SIGN expressing cells, and Mana-L targets specifically these cells (***$p<0.0001$). These preliminary results indicate that the nanovaccine platform would be efficient in targeting DC, therefore could be an important tool in aquaculture vaccine development.