

**1st SPLC-CRS Young Scientist Meeting, April 23rd-24th, 2017**

**Santiago de Compostela, Spain**

**REGISTRATION / ABSTRACT**

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**Academic Status: PhD**

**Registration** (to be sent to *[mgaspar@ff.ulisboa.pt](mailto:mgaspar@ff.ulisboa.pt)*; deadline March 24th)

Thick your option:

Participant (without presenting communication; members/non-members of SPLC-CRS): Yes

Presenter (member of SPLC/CRS): No

**Title of the abstract:** Promoting vaginal distribution of two active siRNA-complexed in liposomes for cervical cancer treatment

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**Abstract (max 300 words):**

Cervical cancer is associated with infection by high-risk human papillomavirus (HR-HPV) and is the third leading cause of cancer-related deaths in women, worldwide. Although prophylactic vaccines are on the market, the prevalence is currently 12 % and the proposed treatments present many side effects. The development of novel, less aggressive and effective treatments against (pre)neoplastic lesions induced by several HR-HPV is therefore crucial.

The use of small interfering RNA (siRNA) is an attractive therapeutic approach to treat several pathologies, such as viral infections or cancers. However, stability and efficacy of these biotherapies are the major obstacles to their use. The development of nanocarriers emerges as the best strategy to overcome biological barriers.

The aim of this work is to develop a treatment against cervical lesions induced by HPV, by a topical application of siRNA complexed in PEGylated liposomes.

We developed several lipoplexes surrounded by different types of polyethylene glycol (PEG), the DSPE-PEG2000, the DSPE-PEG750 and Ceramide-PEG2000, grafted in different densities. This study highlighted the physicochemical properties determining the efficacy of siRNA and the toxicity of the nanocarriers. Following these tests, we selected the lipoplexes formulation containing 20% of Ceramide-PEG2000 which have appropriate physico-chemical properties for vaginal administration and are effective and non-toxic.

The ability of this formulation to diffuse into the cervico-vaginal mucus and to penetrate within a vaginal mucosa was assessed *in vitro*, *ex vivo* and *in vivo*. Lipoplexes containing 20% of Ceramide-PEG2000 effectively disseminate after appearing in mucus and distribute the siRNA in all layers of the mucosa.

The new lipid nanocarrier developed in this work appears as a suitable candidate for the administration of siRNA in the vagina, in order to treat cervical (pre)neoplastic lesions induced by HR-HPV infection.