

**Internship project Master 2
Year 2018-2019**

Laboratory/Institute: IBS (UMR-5075)

Team: MEM-Adénovirus

Director: Winfried Weissenhorn

Head of the team: Pascal Fender

Name and status of the scientist in charge of the project:

HDR: yes no

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Program of the Master's degree in Biology:

- Neurosciences and Neurobiology Immunology, Microbiology, Infectious Diseases
 Integrative Structural Biology Physiology, Epigenetics, Differentiation, Cancer

Title of the project:

Application of new vaccinal platform to immuno-oncology of cancer

Objectives (up to 3 lines):

The goal of this M2 is to generate pseudoviral nanoparticles harboring different epitopes from melanoma using our newly patented technology 'ADDomer'. Those vaccine products will then be assessed to educate *ex vivo* the immune system of patient and the capacity of this latter to kill malignant cells. Survival of humanized mice carrying patient tumor graft will then be investigated after vaccination with the new vaccine products.

Abstract (up to 10 lines):

The ADDomer technology enables 'plug and play' insertion of epitopes in a pseudoviral immunostimulatory scaffold. Due to controlled multimerization, each of these epitopes are displayed at 60 copies at the particle surface. This technology has already shown its efficiency with infectious diseases such as Chikungunya virus and application in the emerging immuno-oncology field would be a great achievement. In collaboration with blood bank (Dr Chaperot and Dr Aspor), a set of ADDomer products displaying tumor-associated antigens from melanoma will be designed and produced. The immune response triggered by those therapeutic vaccines will then be first investigated *ex vivo* and then with humanized mice grafted with patient tumors. This project falls within the fast developing immuno-oncology field and would lead to new intellectual property.

Methods (up to 3 lines):

Vaccine production using recombinant protein expression system. Purification by standard chromatography methods. Cell culture. Flow Cytometry Analysis of immune cell markers.

Up to 3 relevant publications of the team:

<http://www.biovaria.org/technologies-details/multi-epitopic-insertion-platform-addomer/> ((Technology patented)

Richter M, Yumul R, Wang H, Saydaminova K, Ho M, May D, Baldessari A, Gough M, Drescher C, Urban N, Roffler S, Zubieta C, Carter D, Fender P*, Lieber A*. [Preclinical safety and efficacy studies with an affinity-enhanced epithelial junction opener and PEGylated liposomal doxorubicin](#). **Mol Ther Methods Clin Dev.** 2015; 11;2:15005.

Fender P. Use of dodecahedron "VLPs" as an alternative to the whole adenovirus. **Methods Mol Biol.**

2014;1089:61-70.

Requested domains of expertise (up to 5 keywords):

Protein production. Protein purification. Cell imaging. FACS. Immunology