

**M1-Molecular and Cellular Biology (MCB)**  
**Internship Proposal Form**  
**Chemistry-Biology Department**

**(Deadline Wednesday 20<sup>th</sup> October 2016)**

**Laboratory Address and Affiliation**

**Group : Methods and Electron Microscopy (MEM)**

**Team : Adenovirus**

Institut de Biologie Structurale  
Bâtiment CIBB  
71 avenue des Martyrs  
38044 Grenoble Cedex 9

**Laboratory/Team Research area (Keyword)**

Adenoviruses (Ads) are a family of non-enveloped linear double stranded-DNA viruses divided in six sub- groups (A to F), infecting a wide range of hosts, including humans. Ads have been used as a viral vector for gene therapy and also as an oncolytic virus. In collaboration with Prof. A. Lieber (Seattle, USA), we have shown that desmoglein 2 (DSG2) is the main determinant of sub-group B-Ad tropism like Ad3. This discovery opens a new field of applications for these B-Ad vectors.

**Summary of the Proposed Internship Project (10 lines)**

**Title:** Understanding and applications of Ad3 adenoviruses interaction to the desmoglein 2 receptor

**DESCRIPTION:**

Despite our wide in vivo functional and cellular characterization, little is known about the Ad3/DSG2 interaction at the atomic level.

The aim of this project will be to provide the structural basis of Ad3/DSG2 interactions in order to design and create the next generation of cancer vectors or adjuvants.

Our research plan can be divided in three mains steps: (1) Expression and purification of the full DSG2 ectodomain and subdomains; (2) Protein functionality assessment (3) Co-crystallisation of the adenovirus fiber/DSG2 complex and structure solution to identify the critical residues of both partners involved in the interaction. (4) Design and biodistribution studies of DSG2-detargeted or hypertargeted adenoviral vectors.

**Methodologies and/or Techniques to be used**

molecular cloning, protein production (bacteria, mammalian cells), purification and biophysical characterization of protein complexes (e.g BIAcore, MALLS)

**Person to contact:**

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**Additional information**

Wang H, Li ZY, Liu Y, Persson J, Beyer I, Möller T, Koyuncu D, Drescher MR, Strauss R, Zhang XB, Wahl JK 3rd, Urban N, Drescher C, Hemminki A, Fender P, Lieber A. Desmoglein 2 is a receptor for adenovirus serotypes 3, 7, 11 and 14. Nat Med. 2011; 17(1):96-104

Proposal Form send as a PDF fil to: mohamed.benharouga@cea.fr

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