Title: Advanced therapies for the treatment of recessive dystrophic epidermolysis bullosa.

(Terapias avanzadas para el tratamiento de la epidermolisis bullosa distrófica recesiva)

Description of proposed work

The thesis project will focus on developing new advanced therapies for the treatment of recessive dystrophic epidermolysis bullosa (RDEB) lesions, a rare skin disease caused by lack of adhesion between dermis and epidermis due to mutations in the gene encoding collagen VII. Patients with RDEB suffer from extreme skin fragility resulting in continued blistering and wound formation before minor friction, impaired healing with inflammation and constant pain and itching. Recently, correction of mutations causing RDEB by means of precise gene editing techniques has been proposed. Our group has been working for the last fifteen years in the development of ex vivo strategies, and is recognized for its contributions to the field reflected in numerous publications and participation in clinical trials. In this project we propose to develop viral vectors and procedures for the direct transfer of gene correction tools, both replacement and gene editing, to the skin and other epithelia. The work will involve the generation and handling of adenoviral and herpesviral vectors. We will use two mouse models, one for expression of a fluorescent marker protein to study the localization and efficiency of gene modification for each type of vector tested and another that faithfully reproduces the RDEB pathology to directly test the therapeutic utility of the vectors. In addition to addressing the correction of the molecular defect that causes skin fragility, the project proposes a gene therapy approach for the pain, itching and inflammation characteristic of this disease through the development of viral vectors to genetically alter the pathways that mediate pain in the cutaneous innervation.

Framework

The work to be carried out by the predoctoral student is framed in the execution of the project AES2021 PI21/00171 "Correction of RDEB-causing mutations and modulation of pain hypersensitivity and inflammation by in vivo gene editing administered by viral vectors." PI: Rodolfo Murillas.

Details

The predoctoral student will join a research team of recognized trajectory in the field of gene therapy of rare skin diseases. His training in this group will allow him or her to start a research career in biomedicine and molecular biology, developing advanced gene therapy procedures with viral vectors and gene editing technologies.

Requirements
Candidates should hold bachelor's and master's degrees related to biomedical sciences, biochemistry or biotechnology, with a good academic record. Research experience in molecular and cellular biology techniques as well as experience and certified courses to work in animal facilities are desirable.

Thesis Supervisors

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