

Smart Cells and Materials for Tissue Regeneration

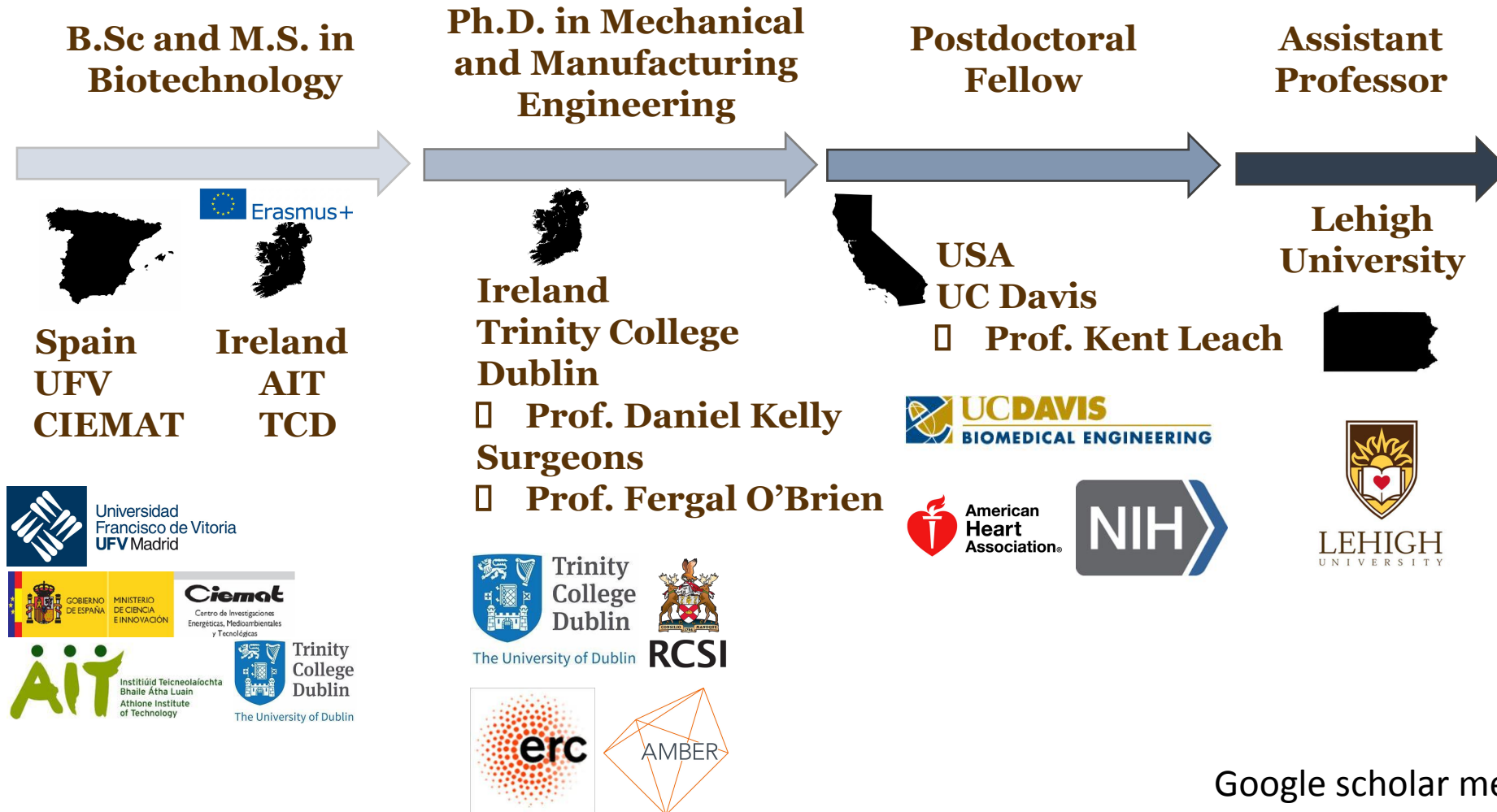
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Fall 2023



LEHIGH
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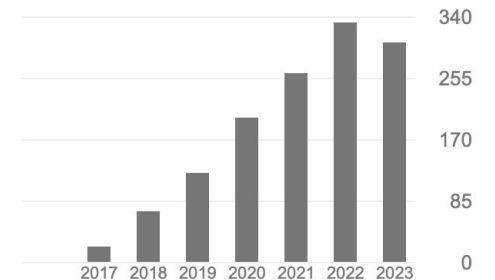


Prof. Tomas Gonzalez-Fernandez

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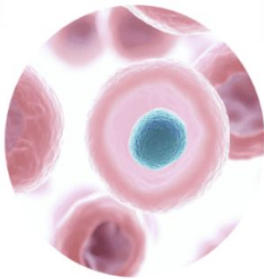
Scientific focus of the TGF Lab

OBJECTIVE: Developing advanced tools and materials for stem cell engineering and musculoskeletal tissue regeneration.

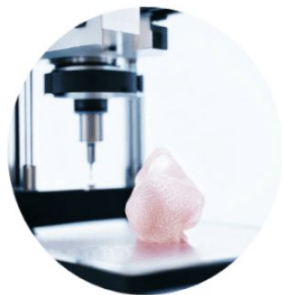
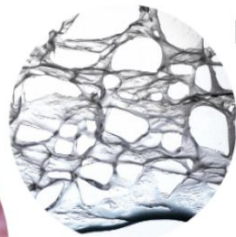
Synthetic biology tools



Stem cells



Smart materials



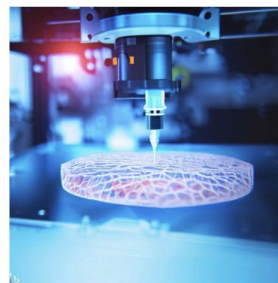
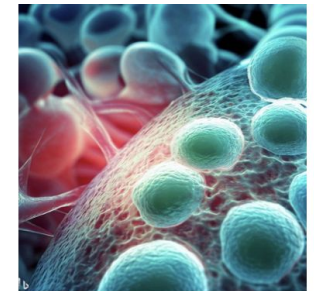
Advanced manufacturing technologies

Cell-instructive tissue grafts



Non-viral strategies for CRISPR/Cas9 gene editing: The TGF Lab is exploring novel synthetic biology tools and their nanoparticle-mediated delivery for the modification of primary stem cells and the production of designer cells with improved therapeutic capacity.

Engineering biomaterials for enhanced regeneration in inflammatory disorders: The TGF Lab is pursuing the engineering of the biological and physical properties of biomaterials to both instruct stem cell function and fight inflammation in degenerative disorders such as arthritis and diabetes.



3D and 4D bioprinting of cell-instructive tissue grafts: As a key technique for the translation of tissue engineering strategies, the TGF Lab leverages different 3D and 4D printing technologies for producing the next generation of musculoskeletal tissue implants able to actively guide and modulate the regeneration process.

Research Support and Contact



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