



DOTTORATO DI RICERCA IN "BIOTECNOLOGIE IN MEDICINA TRASLAZIONALE"

Coordinatore: Prof. Rodolfo Quarto

SEMINARIO

Dr. Martina Piccoli, PhD

Tissue Engineering Laboratory
Fondazione Istituto di Ricerca Pediatrica Città della Speranza
Padova

"Tissue engineering approaches and strategies for congenital diaphragmatic hernia repair"

Congenital diaphragmatic hernia (CDH) is a neonatal defect in which diaphragm muscle does not develop properly, allowing abdominal organs to raise into the thoracic cavity and impeding lungs development and function. Large diaphragmatic defects require correction with prosthetic patches to close the malformation. This kind of treatment leads to a consequent generation of unwelcomed mechanical stress in the repaired diaphragm and hernia recurrences resulting in high morbidity and significant mortality rate. We proposed a specific diaphragm-derived extracellular matrix (ECM) as scaffold for the treatment of CDH. We developed a new surgical CDH mouse model to test the ability of our tissue-specific patch to regenerate damaged diaphragms. Implantation of decellularized diaphragmatic ECM-derived patches demonstrated absence of rejection or hernia recurrence, in contrast to the performance of a commercially available synthetic material. Despite promising results, the use of acellular matrices to repair large defects has been only partially successful highlighting the need of more efficient constructs. Scaffold re-cellularization by means of tissue engineering may improve not only the structure of the matrix, but also its ability to functionally interact with the host. The development of such a complex construct is challenging, due to the complexity of the native organ architecture and the difficulties in re-creating the cellular niche with both proliferative and differentiating potential during growth or after damage. For this reason, we tested the mouse ECM for the generation of a cellular skeletal muscle construct with functional features, and used a home-made bioreactor to correctly stimulate and align the newly generated muscle fibers.

29 Marzo 2019, ore 14.00

Auletta Clinica Chirurgica – Via A. De Toni 16, 16132 Genova

Introduce: Prof.ssa Sveva Bollini