**Unique TERM Strategies Based On The Use of Different Natural Origin Scaffolds, Hydrogels and Stem Cells**

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The selection of a proper material to be used as a scaffold or as a hydrogel to support, hold or encapsulate cells is both a critical and difficult choice that will determine the success of failure of any tissue engineering and regenerative medicine (TERM) strategy.

We believe that the use of natural origin polymers is the best option for many different approaches that allow for the regeneration of different tissues. In addition to the selection of appropriate material systems it is of outmost importance the development of processing methodologies that allow for the production of adequate scaffolds/matrices.

Furthermore an adequate cell source should be selected. In many cases efficient cell isolation, expansion and differentiation methodologies should be developed and optimized. We have been using different human cell sources namely: mesenchymal stem cells from bone marrow, mesenchymal stem cells from human adipose tissue, human cells from amniotic fluids and membranes and cells obtained from human umbilical cords.

The potential of each type of cells, to be used to develop novel useful regeneration therapies will be discussed. Their uses and their interactions with different natural origin degradable scaffolds and smart hydrogels will be described.

Several examples of TERM strategies to regenerate different types of tissues will be presented.