

The Potential of Engineering Methodologies in Relation to Cell-based Researches

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"How shall we control and measure the stem cell responses in the long run when they are implemented in human body?" is obviously the main issue to be solved. Even so many findings from in-vitro experiments have been reported regarding to the control of stem cells, some of them show contradictory results. This suggests us to review some of experimental protocols and related techniques. More specifically, we may need to be equipped with other protocols and/or techniques which are reproducible, quantitative.

In this talk, the bottom line that the cells should experience the same environments as they do in the human body when they are managed in-vitro is pointed out and discussed.

Specifically, the potential and recent strategies on how to embody the bio-mimetic physical environments the cells experience in the human body shall be discussed. The bio-physical environments can be classified into two: mechanical and morphological (geometrical) environment.

Based on the basic requirements in engineering methodology, "reproducible", "quantitative", some of recent hybrid techniques combined with Bio-Mems, Mechanics, and MRS (Magnetic Resonance Spectroscopy) and some related promising outcomes shall be presented.