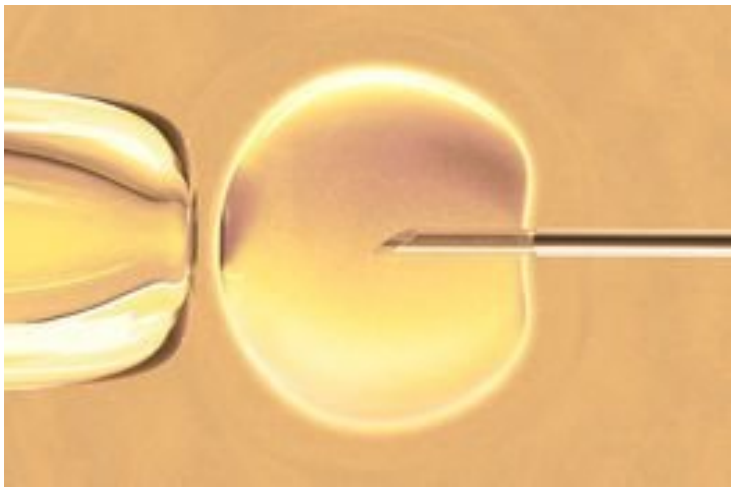
BioSpectrum the business of Bio & Health Sciences ASIA EDITION

Japan scientists pioneer new stem cell technology

24 July 2012 | News | By BioSpectrum Bureau

Japan scientists develop new matrix material that differentiates stem cells



Singapore: A research team at the tissue regeneration materials unit, National Institute for Materials Science (NIMS), succeeded in fabricating two types of cell matrix materials that mimic the dynamically changing extracellular matrix (ECM) during stem cell differentiation. The artificial matrices successfully support human stem cells while they differentiate into either bone or fat cells.

This pioneering development has given all-round high hopes to the emerging field of regenerative medicine. Following the development, scientists now envision growing cells, tissues, and even whole organs, out of stem cells to replace their failing counterparts inside patients. Stem cells have the potential to develop into different types of body cell, but getting them to do so in a petri dish is extremely difficult, because conditions are completely different to how they are inside our bodies.

Attention is now focused on the role of the ECM. This is the chemical environment that surrounds a cell in its natural setting inside the body. The ECM influences the way in which stem cells develop by providing external signals that lead them to differentiate. Recreating the ECM is fraught with problems as it is so complex, and constantly changes depending on the cell's stage of development.

In the future, these kinds of matrix materials are expected to help scientists discover how the ECM controls stem cell differentiation. Ultimately, the aim is to use them for the production of cells for medical applications.