POSTER PRESENTATIONS

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CARBON FIBRE RENFORCED POLYMER (CFRP) CAGE INDUCES BETTER CELLS ADHESION, SPREADING AND PROLIFERATION THAN POLI-ETERE-ETRE-KETONE (PEEK) CAGE.

G. Barbanti Brodano, C. Di Bona, A. Gasbarrini, M. Tognon, S. Boriani, P Parisini
Istituti Ortopedici Rizzoli, Spine Surgery, Bologna, Italy

Engineered osteoblast cells which constitutively expresses high level of enhanced green fluorescent protein (EGFP) (patent FI2005A000038) were seeded on PEEK and CFRP vertebral cages. Culture of the cells on glass cylinder was the negative control. In our essay, we considered that parental Saos-2 cells need approximately 36 hours to complete a single cell cycle, while the glass was the material used as comparative internal control (100%) of the CFRP and PEEK cages. Cultures analyzed at 36 hours indicated that the percentage of cells grown on PEEK (121%) was slightly higher than that on CFRP (116%). Cell adhesion and proliferation on the two different materials were re-evaluated at 84 h. The percentage of cells grown on PEEK increased in a fashion similar to that observed on the glass (13%), while cells on CFRP increased more than five times (53%). The observation of the living cells directly on the cages showed a different distribution of the cells on the two different biomaterials. On the CFRP cage the cells were homogeneously distributed as a continuous monolayer, while on the PEEK cage the cells were layered in a discontinuous mode, distributed in non-homogeneous way, and associated in clusters. The possibility to know which cages enhance osteobalsts adhesion and proliferation could be an important step in trying to obtain a solid spine fusion. Adhesion, spreading and proliferation of osteoblast cells can dramatically differ depending on the material. Here we demonstrated that CFRP surfaces enhanced these characteristics of osteoblast cells in comparison with PEEK. Similar assays on biomaterials are in progress using mesenchymal stem cells (MSC) to evaluate the osteoinduction, osteoconduction, and osteogenesis that are specific characteristics of MSC, when they are induced in the osteogenic lineage.