**(OP 218) Osteoconductive Scaffolds Obtained by Means of *In Situ* Surface Functionalization of Wet-Spun Fibre Meshes for Bone Regeneration Applications**

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The success of bone tissue engineering (TE) strategies is strongly dependent on the development of new synthetic materials combining osteoconductive, osteoinductive and osteogenic properties. Recent studies suggest that biomaterials incorporating silanol groups promote and maintain osteogenesis with or without biological stimuli. This study aims to evaluate the osteoconductivity and osteogenic properties of novel wet-spun fibre mesh scaffolds of SPCL (blend of starch with polycaprolactone) with or without superficial functionalized silanol (Si-OH) groups by seeding/culturing them with goat marrow stromal cells (GBMCs). A calcium silicate solution was used as a non-solvent to precipitate the SPCL solution by wet-spinning and to develop an *in situ* functionalization methodology of the SPCL fiber mesh with silanol groups. GBMCs were seeded onto SPCL scaffolds with or without Si-OH groups (control) for 7 or 14 days in different culture medium; shifting osteogenic growth (beta-glycerophosphate, ascorbic acid) or differentiation (dexamethasone) factors. The fiber meshes-GBMCs constructs were characterized analyzing cellular viability, proliferation, early differentiation as well as matrix mineralization. The bioactive 3D fibre meshes with superficial Si-OH functional groups produced by a one-step wet-spinning technique not only sustained cell proliferation and viability, which increased with the culturing time, but also the higher ALP activity levels and matrix production in the Si-OH fiber meshes indicated that Si-OH groups improve cellular functionality towards the osteoblastic phenotype, which we believe to have an enormous potential for bone regeneration applications.