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Drug Releasing PLGA Nanoscaffold

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Abstract: Introduction: Research of nanotechnology has recently taken place also in biomaterials science. Biological environments are full of nano size constructs, hence making biomimetic materials should comprise structures within nano range. To produce fibrous nanostructures, self-assembly or electrospinning can be used. Adding drug release function to such material may advance applications further for use in controlled tissue repair. The resulting device can be seen as multifunctional fibrous structure with desirable porosity to support cells and drug releasing properties to control tissue reactions. Materials and Methods: A bioabsorbable poly(D,L lactic-co-glycolide) 80/20 (PLGA80/20) was dissolved to chloroform to form dilute solution. 20w-% of test drug was added. Nano-fibers were made by electrospinning onto substrate. Microstructure of the resulting nanomat was studied using SEM and drug release profiles with UV/VIS spectroscopy. Results and Discussion: Thickness of electrospun nanomat was about 1 mm. SEM analysis showed that polymeric nano-fibers containing drug particles form very interconnected porous nano structure. The average diameter of nano-fibers was 500nm. After the high start peak of drug release the rate was decreased during 11 days considerably. During drug release tests the material was degraded quickly and vanished. Drug release tests lasted for about 90 days. More details will be reported later. Conclusion: The nano-fibrous porous structure made of bioabsorbable polymer loaded test drug is feasible to develop and hoped to improve biomaterial properties for controlled tissue repair and regeneration.