



NECMETTİN ERBAKAN
UNIVERSITY
FACULTY OF AVIATION
AND SPACE SCIENCES

PROJECT INFO SHEET

PROJECT STAFF INFO

Name-Surname/Title	Ahmet AKDEMİR/Prof. Dr.
Department	Aeronautical Engineering
Role in the Project	Executive

Nanofiber Production for Use for Scaffolding Design in Bone Tissue Engineering

Partners/Participants/ Stakeholders	
Research Topic	Engineering
Impacts of the Projects	<p>In bone tissue engineering, scaffold tissue formation is created to mimic the natural extracellular matrix (ECM). Thus, cell growth, biocompatibility, high porosity, high surface area, dynamic remodeling, mechanical strength are provided.</p> <p>In particular, nanofiber forms are mainly applied for artificial extracellular matrices. Nanofibers are fibers with diameters of 100 nanometers or less. Nanofibrous scaffolds are ideal for bone regeneration due to their mechanical, structural, and durability properties.</p> <p>Polymeric materials in nanofiber forms show strong properties such as high surface-to-volume ratio, adjustable porosity, and surface functionality.</p> <p>The most common nanofiber production method is the electrospin method. The electrospin method is beneficial, effective, fast, and cheap. With this method, ultra-thin (10-100 nm) nanofiber membranes are produced from various liquid polymers (PVA, PU, PA, etc.).</p> <p>It is aimed to construct an artificial tissue scaffold using PLGA and HA. Thanks to the bone scaffolds produced by the study, it will help the reflections in orthopedics, and the deficiencies in this field will be eliminated.</p>
Keywords	Electrospinning, nanofiber production, PLGA, bone tissue engineering, HA, scaffold design
Start-End Date	00.00.0000 - 00.00.0000
Project Budget	

Summary

Although different applications are used to repair damaged bone structures, the focus is on bone regeneration methods. For this reason, recent studies in tissue engineering focus on artificial bone scaffold design and production. In producing synthetic bone scaffolds, high porosity rate, inter-pore bonds, the strength of the material used, and biocompatibility are important issues. Since nanofibers produced by the electrospinning method have an extremely high surface-area-to-volume ratio, gas permeability, and a highly porous structure, in this study, artificial bone scaffold design and production in tissue engineering will be done by electrospinning method using PLGA / HA and SEM, TEM, FTIR analysis chemical characterization processes of the material will be carried out.

Expected and/or Achieved Results