3D printing is a rapidly growing field of technology. It is characterized by wide application in structural engineering, medicine and pharmacy, as well as in manufacturing of everyday life elements. Recently, interest in 3D printing has also been developed in tissue engineering - a field of engineering science that deals with the construction of functional replacements from scratch for human tissues and organs that are unable to perform their function as a result of damage or disease. 3D printing is used here as a synthetic scaffold for growing tissue, in which case one can speak of a so-called tissue scaffold or scarf, and for making molds in which scaffolds of other materials of a specific shape will be obtained. A separate topic closely related to the application of 3D printing in tissue engineering is the preparation of so-called biofilaments - a type of "inks" for 3D printers that can be used in direct contact with cells due to their biocompatibility obtained by using biodegradable polymers for their production. This project has two objectives - to design such bioinks made of polymeric materials derived from citric acid and diols (alcohols with two functional groups) called PAC and itaconic acid - an organic acid with double bonds, and to make and test 3D printer molds to produce PAC materials in the form of tubes with different sizes or wall thicknesses. PAC materials are studied for their use in the fabrication of tissue scaffolds for blood vessels, thanks to the use of biologically inert raw materials, which gives them very good cellular and mechanical properties. The addition of itaconic acid to liquid unpolymerized PAC materials serves to sensitize such material to light - when a photosensitive compound, called photoinitiator, is added to the mixture, it initiates polymerization and thus the liquid biofilament can become a stable structure of the shape designed by us. In the project we will carry out tests to select an appropriate chemical composition of bioinks, perform biological tests to determine their influence on the growth and development of human cells and tissues, and conduct full testing of mechanical properties and tensile strength, as well as measurements of degradation of these materials to determine the rate of their degradation in the body. It is also planned to select a suitable resin for printing the above-mentioned molds to receive scaffolds in the form of tubes, and then to make several types of molds and carry out trial reactions in the molds to receive scaffolds. As a result of the research it is planned to obtain several different composition of the bioinks and scaffolds made from it, the characterization of their properties, as well as the obtaining of several variants of the molds for the tubular grafts crosslinking and biological and mechanical characterization of the obtained trial grafts.