

ABSTRACT

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Title of diploma thesis: The influence of preload on change of mechanical properties of the aortic walls

The subject of this thesis is to monitor the influence of preload on change the mechanical properties of the aortic walls. Department of Biophysics and Physical Chemistry Faculty of Pharmacy of Charles University in Hradec Kralove studies the mechanical properties of the biological materials or synthetic materials for many years. The aim of this work is to continue research on measurements of the properties of the arterial walls, because the changes in the mechanical properties are associated with aging and may cause a wide range of cardiovascular diseases.

The theoretical part is devoted to the anatomical and histological structure of the aorta walls. Summarizes theoretical knowledges of biomechanics and rheology of viscoelastic bodies. It describes the physiological functions and biophysics of the bloodstream. And also is focused on pathological changes that are related to changes in mechanical properties.

The experimental part is focused on the type and preparation of biological material, creation of samples, measurement methodology and results processing. The samples were measured on the site of the Department of Biophysics and Physical Chemistry. Biological material being porcine thoracic descending aorta, originating from domestic swine (*Sus scrofa f. domestica*), from which samples were carved in horizontal direction. We measured dependence of the strength on a relative elongation in static mode stress. The data were processed by software and used to calculate the Young modulus of elasticity E [Pa].

In the following part are listed and summed the results of or measuring. The work is finished by discussion.