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THE USE OF RADIATION-INDUCED GRAFT POLYMERIZATION FOR OBTAINING POLYMERIC BIOMATERIAL ON THE BASIS OF PREPARATION "PIYAVIT"

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The purpose of the present study is to obtain hemocompatible polymeric materials. The method of modification of polymer surface have been elaborated using the radiation-induced graft polymerization after which the surface is capable of coupling with the biologically active substances (BAS) produced from the medicinal leeches.

At the Biological Department of Lomonosov Moscow State University was created a medicinal preparation "Piyavit" isolated from the salivary glands secretion of the medicinal leeches (*Hirudo medicinalis*) [1]. It possess a wide spectrum of biological action on the human organism thanks to the presence of an unique complex natural of BAS (enzymes, inhibitors of proteolytic enzymes, prostanooids and et. al) guaranteed the anticoagulating, thrombolytic, antithrombotic, antiphlogistic, antiatherosclerotic, hypotensive effects and et al. . It has several advantages over anticoagulant heparin which is widely used for above mentioned purpose. "Piyavit" is the multifunctional preparation, has not negative side-effects and is more cheap.

The method of obtaining biocompatible polymers (basically polyethylene) with immobilized "Piyavit" consist of three stages:

1. The modification of polymer surface by the radiation-induced graft polymerization of acrylic acid to obtain grafted chains polyacrylic acid (PAA) with controlled number and length.
2. The treatment of radiation grafted PAA by thionyl chloride that lead to conversion carboxyl groups of PAA in highly reactive acide chloride groups [2].
3. The covalent immobilization BAS of "Piyavit" by acylation amino- and hydroxy-groups (functional groups in BAS) by acide chloride of PAA grafted on the polymere.

The process of the obtaining of modified polymeric biomaterials is controlled on the each stage by the methods of IR- and UV-spectroscopies. The possibility a quantitative estimation of immobilized components of preparation "Piyavit" on the polymer surface is discussed.

Preliminary tests of anticoagulant active of obtained polymeric biomaterials showed the positive effect in comparison with control specimens.

[1] Treatment of the medicinal leeches and preparation of them. Proceedings of the Conferences Hirudologists Association (1992 -1997), Moscow, 1998 (russian).

[2] T.V.Degtyareva, Val.N.Kudryavtsev, R.E.Aliev and V.Ya.Kabanov Vysokomol.Soedin. (Polymer.Sci.), A33 (1991), 1913.