

Immobilization of antitumor enzyme L-lysine alpha-oxidase from *Trichoderma cf. aureoviride* Rifai on the nanocomposite polyGraphene as matrix for cancer screening, diagnosis and treatment

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It was discovered that expanded graphite – Nanocomposite of PolyGraphene (PG) obtained after hydro-thermic treatment of modified graphite became to be able to interact as sorbent PG with enzyme L-lysine alpha-oxidase from *Trichoderma cf. aureoviride* Rifai.

It was studied the sorption properties of carbon material as an example of PolyGraphene (PG) concerning enzyme L-lysine alpha-oxidase from *Trichoderma cf. aureoviride* Rifai.

PG - version of ultrafine carbon sorbent, which was developed on the basis of the modified oxygen-containing expanded graphite (OCEG).

L-Lysine α -oxidase (LysOx) is one of the enzymes which are prospective in biotechnology and medicine due to its antitumor and kinetic properties. An *in vivo* therapeutic effect was demonstrated on animals with tumor grafts: breast carcinoma SKBR3, Bro melanoma, intestinal cancer HCT116 and LS174T, ovary adenocarcinoma SCOV3, liver carcinoma.

This work aims to immobilize the extracellular L-lysine α -oxidase (LysOx) from *Trichoderma cf. aureoviride* Rifai VKM F-4268D on PolyGraphene and characterize some properties of adsorbed enzyme. Two types of PolyGraphene were used. Maximum adsorption equal to 5 or 11 μg protein/ mg of carrier was achieved, a high specific activity comparable to that of a free enzyme to take place.

LysOx adsorbed on PolyGraphene was shown to be a very stable system, namely high stability was revealed in the presence of chaotropic agent (urea) or proteolytic enzymes (pronase, chymotrypsin, trypsin).

Thus, the possibility of immobilization of LysOx on graphene with the full conservation of specific activity was shown.

In addition, LysOx is one of the enzymes that is promising in the enzyme therapy of tumors, based on the high sensitivity of tumor cells to the deficiency of growth factors, including amino acids.

Conclusions. Researchers have the theoretical and practical importance, the received results can be applied as matrix both in cancer screening, diagnosis and treatment and in cleaning of already known enzymes.

Biography

Dmitry Malenkov is now studying Public health management and Economics in Higher School of Economics. Surgeon, cardiothoracic surgeon, oncologist, scientist, public health administrator, co-founder of Scientific center for integrative medicine. Dmitry Malenkov is the author of more than 40 papers, in the field of clinical and experimental medicine.

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