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BIODEGRADABLE POLYMER/GRAPHENE OXIDE COMPOSITE FOR IN VIVO USE*

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Recently, there has been a growing need for the installation of implants to monitor particular processes, stimulate cell growth or activity, or replace tissues. The use of remote monitoring using biodegradable materials would facilitate the work of doctors, simplify the lives of patients, and also have a beneficial effect on the environment. Remote monitoring would allow monitoring of the tissues around the implant and the condition of the implant itself. Reduced graphene oxide (rGO) is one of the promising carbon materials due to its distinctive properties: low cost, ease of production, and high conductivity. It is proposed to create electronic components based on laser-reduced graphene oxide and biodegradable polymers for monitoring the state of the implant. The study of the properties of rGO on biodegradable polymers made it possible to select laser reduction parameters and select the PLLA polymer for further study. The mechanical stability test suggests the formation of a composite of rGO and polymers. After chemical exposure, a change in conductivity is observed. The samples were shown to be non-toxic for fibroblast, which means they were found to be suitable for subsequent studies. Further, the electrical characterization and approaches to creating the electronic components have been investigated. This work paves the way for the creation of composites based on graphene-like materials and polymers that would be suitable for implantable electronics.

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