

## Chemical Cross-Linking Agents for Collagen: Interaction Mechanisms and Perspectives for Regenerative Medicine

Yu. A. Nashchekina<sup>a, \*</sup>, O. A. Lukonina<sup>a</sup>, and N.A. Mikhailova<sup>a</sup>

<sup>a</sup>*Institute of Cytology RAS, St. Petersburg, 194064 Russia*

<sup>\*</sup>*e-mail: yuliya.shved@gmail.com*

The development of regenerative medicine contributes to the implementation of cellular technologies and the development of new bioactive materials. For the cell cultivation and transplantation, it is necessary to create scaffolds, the structure and properties of which would be identical to their native environment. The ideal material for forming such scaffolds is collagen - one of the main structural elements of most body tissues. In the process of collagen extraction from natural sources, bonds between molecules are broken, which leads to a significant loss of structural and mechanical functions. Therefore, the search for cross-linking agents, the study of their structure and mechanisms of interaction with collagen molecules is an critical fundamental and applied problem. The review discusses different methods and mechanisms of cross-linking of collagen molecules, as well as the effect of cross-linking conditions on the functional activity of cultured cells.

**Keywords:** collagen, glutaraldehyde, carboxylic acids, genipin, imides