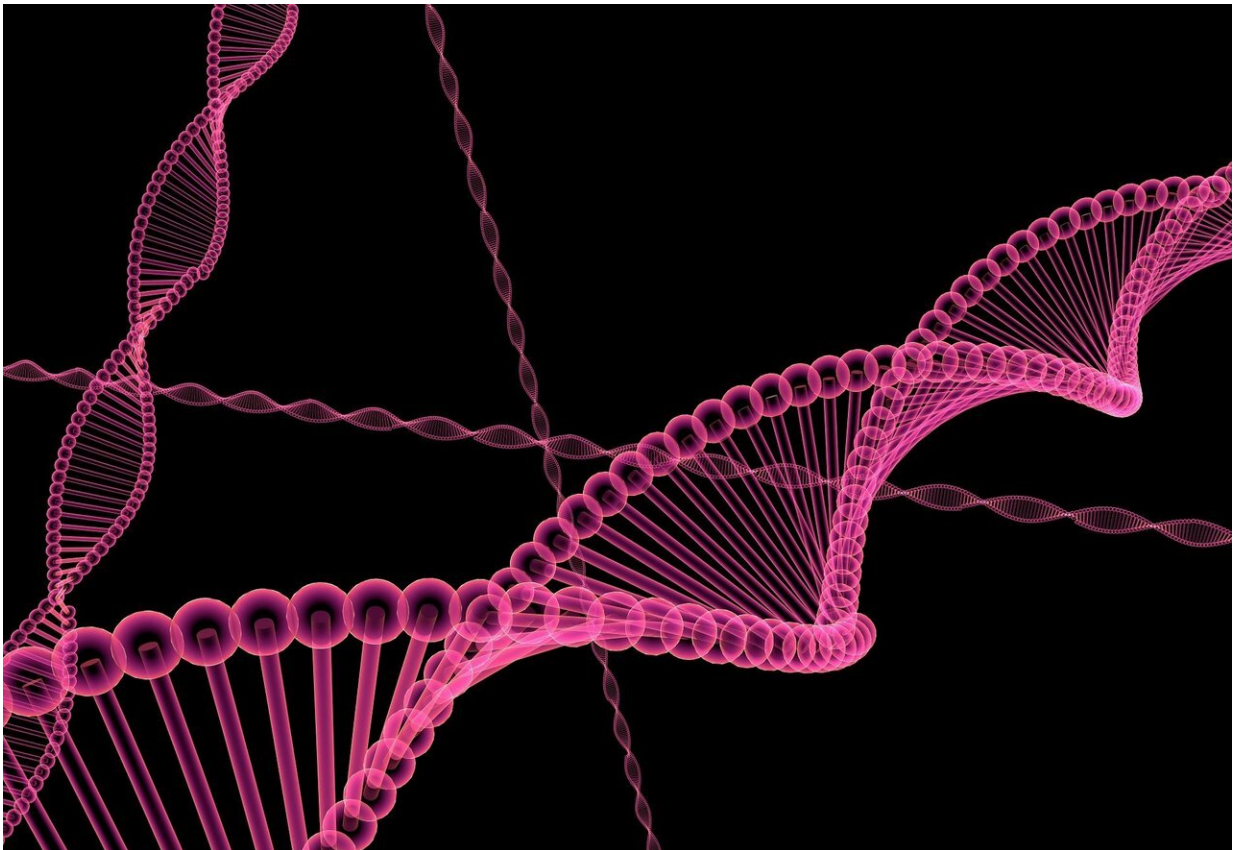


# Potential pitfalls when using the Cre-LoxP system in cancer research

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A new editorial paper has been published in *Oncoscience*, titled, "[Be mindful of potential pitfalls when using the Cre-LoxP system in cancer research.](#)"

In this editorial, researchers Piotr Czarnota and Jaroslaw Cisowski from Jagiellonian University discuss Cre-LoxP—a widely used system to conditionally modify [gene expression](#) in mouse models of [cancer](#) and other diseases.

"It is based on specific recognition and cutting of LoxP elements embedded in the genome by [Cre recombinase](#)," say Czarnota and Cisowski

The [genetic modifications](#) induced by Cre-LoxP can be spatially and/or temporarily restricted to specific tissues due to the use of cell-specific and/or inducible gene promoters driving Cre expression. However, the specificity of Cre expression depends on the cell type fidelity of these promoters. Thus, the appropriate interpretation of experimental results involving the Cre-LoxP system requires knowledge of the activity pattern of a given gene promoter in organs and tissues.

In this regard, it is worth emphasizing that the activities of some gene promoters utilized to drive Cre expression are not specific to intended [cell types](#).

As an example, many of the pancreatic endocrine and ductal cell-specific promoters are also expressed in some brain neurons, liver, stomach, and intestines, and may be temporarily active at early [stages of development](#), resulting in the lack of specificity of genetic recombination.

This problem is not limited by any means to the pancreas, e.g., a Lys2 promoter, a gene encoding a protease Lysozyme M, widely used to delete genes in the myeloid lineage, is also active in type 2 [pneumocytes in the lungs](#). Moreover, microvesicles-mediated transfer of Cre mRNA into neighboring cells may also contribute to unfaithful labeling of cells and lead to false interpretation of results.

"The use of Cre-LoxP system to interrogate [cancer biology](#) poses additional challenges to be considered for proper interpretation of the results," say the researchers.

**More information:** Be mindful of potential pitfalls when using the Cre-LoxP system in cancer research, *Oncoscience* (2023). [DOI: 10.18632/oncoscience.591](#)

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