Advances in Pharmacology and Therapeutics Journal
Shahid Sadoughi University of Medical Sciences, Yazd, Iran

SHAHID SADOUGHI UNIVERSITY OF MEDICAL SCIENCES

Editorial Article

Targeted Therapy Based on Peptide– Drug Conjugates

Running Title: Targeted therapy by Peptide– Drug Conjugates

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ARTICLEINFO

Received: 06/08/2026
Accepted: 06/10/2026

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Abstract

Peptide–drug conjugates (PDCs) are useful in new targeted therapy, especially in cancer. It has also been established that proteases are highly expressed in cancer types. These enzymes can cleave the linker, releasing the drugs as a key payload within the tumor. Therefore, overexpression of cathepsins in tumor environments is a favorable characteristic for targeted cancer therapy. The linker must exhibit stability in circulation to avoid undefined cargo release. Releasing with no goal can cause some problems with the enhancement of toxins, which can lead to hazardous or even incurable side effects. Payloads as cytotoxic agents usually show low IC50 values and high toxicity. Two payloads applied within PDC types include Taxol and Daunorubicin.

Keywords: Peptide–drug conjugates, Targeted therapy, Cancer

Citation: Lotfi M, Shahcheraghi S.H. Targeted Therapy Based on Peptide– Drug Conjugates. Adv Pharmacol Ther J. 2025;5(4): 247-248.

Dear Editor

The novel tools, titled peptide–drug conjugates (PDCs), are beneficial in new targeted therapy. PDCs include three main parts: a) a peptide titled homing, b) a linker between parts, and c) a payload (1). The first part of the peptide is responsible for directing the entire PDC structure to target cells in different diseases, especially cancer. So, the most important character related to a drug is penetrance to the damage site, and the homing peptide performs it for a PDC (2). Also, the homing peptide not only guides the drug to the target tissue but also facilitates its internalization, specifically and only at the site of our aim (1).

The linker must exhibit stability in circulation to avoid undefined cargo release. Releasing with no goal can cause some problems with the enhancement of toxins, which can lead to hazardous or even incurable side effects. The linker applied for PDC types can be as cleavable, which is usually perfected (3).

Payloads as cytotoxic agents usually exhibit low IC50 values and high toxicity. Two payloads applied within PDC types include Taxol and Daunorubicin (4). Also, the payloads can be radionucleotide types.

This point is vital: PDCs are not restricted to the delivery of toxic agents but are also extensively used as imaging tools, such as PDCs containing radionucleotides (5).

An interesting example of PDCs is the use of Daunorubicin conjugated to a peptide (NGR) via a cleavable linker. The concentration of cathepsins available in the endosome and lysosome is more than in other parts of the cells (6). It has also been established that proteases, especially cathepsins, are highly expressed in many cancer types. These enzymes can cleave the linker mentioned above, releasing the Daunorubicin drug as the main payload. Therefore, overexpression of cathepsins in tumor environments is a favorable characteristic for targeted cancer therapy.

Conflict of Interest: Authors state that they have no conflicts of interest.

Funding: No

Authors' contribution: Writing Primary draft: SHSH, ML. Revision: SHSH. Final approval: SHSH, ML

References

References

1.Cooper BM, Iegre J, O'Donovan DH, Halvarsson MÖ, Spring DR. Peptides as a platform for targeted therapeutics for cancer: peptide–drug conjugates (PDCs). Chemical society reviews. 2021;50(3):1480-94.

2.Jadhav K, Abhang A, Kole EB, Gadade D, Dusane A, Iyer A, et al. Peptide–Drug Conjugates as Next-Generation Therapeutics: Exploring the Potential and Clinical Progress. Bioengineering. 2025;12(5):481.

3.Lei Y, Zheng M, Chen P, Seng Ng C, Peng Loh T, Liu H. Linker design for the antibody drug conjugates: a comprehensive review. ChemMedChem. 2025;20(15):e202500262.

4.Pysz I, Andriollo P, Thurston DE. Traditional cytotoxic agents as antibody–drug conjugate (ADC) payloads. 2019.

5.Ullah A, Khan M, Zhang Y, Shafiq M, Ullah M, Abbas A, et al. Advancing therapeutic strategies with polymeric drug conjugates for nucleic acid delivery and treatment. International Journal of Nanomedicine. 2025:25-52.

6.Heh E, Allen J, Ramirez F, Lovasz D, Fernandez L, Hogg T, et al. Peptide drug conjugates and their role in cancer therapy. International Journal of Molecular Sciences. 2023;24(1):829.

  DOI: https://doi.org/ 10.18502/aptj.v5i4.21765