

Recent progress in biomedical applications of RGD-based ligand: From precise cancer theranostics to biomaterial engineering: A systematic review

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Abstract

Arginine-glycine-aspartic acid (RGD) peptide family is known as the most prominent ligand for extracellular domain of integrin receptors. Specific expression of these receptors in various tissue of human body and tight association of their expression profile with various pathophysiological conditions made these receptors a suitable targeting candidate for several disease diagnosis and treatment as well as regeneration of various organs. For these reasons, various forms of RGD-based integrins ligands have been greatly used in biomedical studies. Here, we summarized the last decade application progress of RGD for cancer theranostics, control of inflammation, thrombosis inhibition and critically discussed the effect of RGD peptides structure and sequence on the efficacy of gene/drug delivery systems in preclinical studies. Furthermore, we will show recent advances in application of RGD functionalized biomaterials for various tissue regenerations including cornea repair, artificial neovascularization and bone tissue regeneration. Finally, we analyzed clinical translatability of RGD peptides, considering examples of integrin ligands in clinical trials. In conclusion, prospects on using RGD peptide for precise drug delivery and biomaterial engineering are well discussed.

Keywords

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