

## Peptide-based drug delivery for anti-cancer therapy

### Abstract:

Cancer is a major public health concern which resulted in almost 10 million deaths in the year 2022. Traditional modes of treatment like surgery, radiotherapy and chemotherapy cause substantial side-effects and are not efficacious in metastatic cancer conditions. Drug delivery methods provide the possibility of specifically targeting cancer, minimizing the damage to non-cancerous cells. One such mode of drug delivery is the utilization of cell-penetrating peptides (CPPs) which can travel across the cellular membrane and enter the cell. These CPPs can be conjugated to a wide range of cargo molecules for intracellular delivery. In this work, we have designed and synthesized a series of peptides based on their electrostatic features to specifically deliver an anti-cancer drug molecule to cancer cells and drug resistant cancer cells. The penetrative ability and cancer cell cytotoxicity of the CPP-drug conjugate was tested using in-vitro studies. The conjugates also showed significant tumor reduction in breast cancer mice models. Thus, our designed peptide-based delivery vectors present a novel approach for targeting cancer and cancer drug resistance.

### Keywords:

Drug delivery; Cell-penetrating peptides; electrostatic potential; cancer; cancer drug resistance