

# RGD Mimetic $\gamma$ -AApeptides and Methods of Use

**R**esearchers at the University of South Florida have synthesized a novel class of peptidomimetics, including  $\gamma$ -AA peptides. These compounds can be used for targeted drug delivery and as therapeutic and diagnostic agents in the treatment of various cancers.

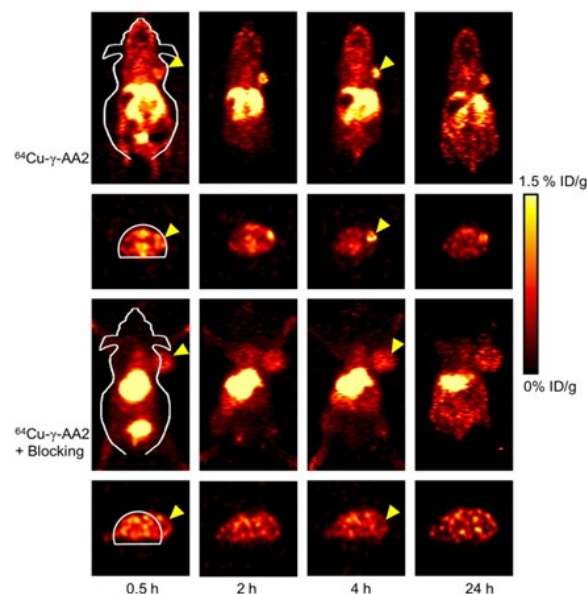
The specific recognition site of integrins with their ligands known as Arginine-Glycine-Aspartic (RGD), regulates cell-cell and cell-extracellular matrix interactions. Over the last few years, significant interest has been shown in the development of molecules including peptides and non-peptidic small molecules that can mimic the RGD motif, so as to specifically target integrins overexpressed by tumors and tumor cells as a new means of cancer targeted imaging and cancer treatment. Currently, available peptide-based RGD mimetics suffer from poor stability against proteolytic degradation. Such disadvantages pose obstacles for further development of RGD peptides. Furthermore, the small non-peptidic molecules, either lack specificity or are difficult to derivatize for various applications such as attachment of radioisotopes, fluorophores, or drugs for targeted imaging and drug delivery.

Our scientists have developed novel  $\gamma$ -AA peptide RGD mimetics that are able to target integrin  $\alpha\beta3$  specifically, and exhibit significantly higher stability than commonly used RGD peptides. In mouse tumor models, radiolabeled  $\gamma$ -AA peptide RGD mimetics exhibited integrin  $\alpha\beta3$ -specific uptake in tumors. These mimetics have the potential to be used for targeted drug delivery as well as therapeutic and diagnostic agents in the treatment of various cancers.

### ADVANTAGES:

- Higher stability
- Specific uptake in tumors
- Novel therapeutic potential in cancer

### *$\gamma$ -AApeptides for the Diagnosis and Treatment of Cancer*



*Serial PET imaging and biodistribution studies of  $^{64}\text{Cu}$ - $\gamma$ -AA2 in U87MG tumor-bearing mice. Arrows indicate tumors.*