

## Bifunctional Peptide Derivatives with Opioid Agonist and Substance P Antagonist Activities

**Background:** Both opioid agonists and substance P antagonists play a vital role in the neuropathic pain state. Co-administration of an opioid agonist and a substance P antagonist has shown antinociceptive potency in acute pain states. Furthermore, the co-administration of these compounds has shown a decrease in overall opioid induced tolerance in chronic trials. This suggests that the action of the opioid agonist is closely linked to that of substance P rather than each operating independently of one another.

### Applications:

- Development of bifunctional peptides that incorporate both the opioid agonist and substance P pharmacophores

### Advantages:

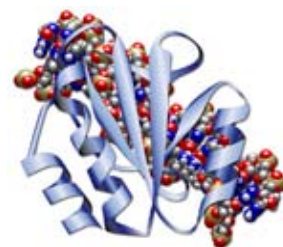
- Administration of a bifunctional peptide is easier than each of the individual components separately
- Higher antinociceptive potency without the development of analgesic tolerance

**The Technology:** Researchers at the University of Arizona have designed novel chimeric molecules that incorporate both the d/μ opioid agonists and substance P antagonists into a single compound. This molecule may have a higher local concentration at its target which could lead to a stronger therapeutic effect than a combined administration of the individual components. This type of bifunctional peptide is not uncommon; however, the affinity of the compounds developed herein to its target is 1000 times more potent than reported peptide derivatives based on an alternative design.

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