Novel Superior Peptides for the Treatment of Myocardial Infarction

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Technology description

BACKGROUND:
Myocardial Infarction (MI), is the medical term for heart attack, which has been estimated to affect 7.9 million Americans annually. Approximately every 25 seconds, an American will experience a coronary event: one in two of these events will end terminally. Due to the increasing prevalence of MI, there has been much research into treatment strategies. The traditional drug development pathway of small molecule intervention has found very limited success. One growing area of research, peptide based drug development, has seen progressive growth over the past few decades. Peptides are classed as molecules that contain between two to fifty amino acids bonded together. The large structure of peptides offers a specific binding not found in small molecule therapeutics, due in great part to the peptide’ s ability to adopt a specific conformation allowing interaction with corresponding sites. When the peptides are cleared by the body through metabolism, they disassociate into common amino acid chains that do not offer toxic complexing as seen in small molecule therapies. However, as of currently, there has been limitedly successful peptide therapeutics that are capable of intervening in MI progression. A major factor in the limited success of peptides in the intervention of MI, has been the ability of the peptides to permeate myocardial tissue, and the ability of these peptides to withstand degradation at the target site.
INNOVATION:
UCLA researchers in the department of Anesthesiology have developed a novel series of peptides that are capable of effectively treating MI. The new peptides can be synthesized and delivered i.v. acutely to patients experiencing MI or during percutaneous coronary intervention treatment: offering more versatility to peptide intervention compared to previous generations of peptide treatments. The novel peptides offer increased ability to permeate through myocardial tissue, and increased metabolic stability. These attractive characteristics allow a greater concentration of peptides to be delivered to the site of infarct, and remain intact long enough for protective benefits. In a comparison to clinically relevant peptides for MI therapy, the novel peptides exerted superior cardioprotective effects by substantially reducing infarct size. This observation has not been seen in previous peptide generations, suggesting that the novel peptide series may serve as clinically relevant peptides in the near future.

Application area

• The treatment of Myocardial Infarction (i.v. or through percutaneous coronary intervention)

Advantages

• Increased permeability of the peptides to the site of Infraction

• Increased metabolic stability, allowing for extended myocardial protection

• The only observed peptide therapeutic to produce noticeable infarct size reduction

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