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Heat Shock Protein 27 (HSP27) Kinase Inhibitor Peptides

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Inventors

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Invention Description

Wound healing is one of the most important processes in the body. When the healing process, however, is overly active at the cellular level, fibrosis can occur. This can result in scarring that can obliterate the architecture of the underlying organ or tissue. Smooth muscle cell migration can also occur, likewise promoting scar formation. If the healing process could be controlled, it would have important applications in many areas of medicine.

Researchers at Arizona State University, Purdue University, and the Department of Veterans Affairs have developed a polypeptide that inhibits phosphorylation of HSP27. HSP27 is a small heat shock protein that has been shown to alter cytoskeletal dynamics. When phosphorylated, HSP27 promotes myofibroblast formation and also migration of smooth muscle cells, both processes that can cause fibrosis if overly active. The novel polypeptide inhibits phosphorylation by the HSP27 kinase MAPKAP2.

Because the actions of phosphorylated HSP27 are widespread, regulating its phosphorylation via this polypeptide may have applications in many areas of human health, including heart disease, cardiac and vascular surgery, wound healing, and treating fibrotic disorders or keloids.

Potential Applications

- treating any medical condition that would benefit from
  - reducing smooth muscle cell proliferation or migration
    - following bypass surgery, stent placement, etc.
  - promoting smooth muscle relaxation or treating heart disorders
    - bradyarrythmia, stunned myocardium, diastolic dysfunction, etc.
  - promoting wound healing
  - reducing fibrotic disorders, keloids, or scar formation
  - reducing the incidence of intimal hyperplasia, stenosis, restenosis, and atherosclerosis

Benefits and Advantages

- polypeptide functions intracellularly
- works downstream of other compounds that function on the same pathway
- more targeted function than other similar compounds

Intellectual Property Status:

Patent Pending

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