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ASIA EDITION

Korea develops micro-needle bandage for cardiac tissue regeneration

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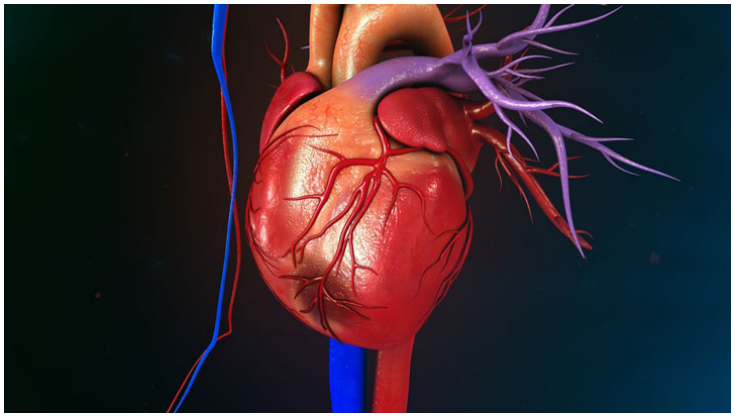
Damaged cardiac wall is regenerated by delivering biofunctional peptides to the myocardial infarction site through microchannels



A research team at South Korea-based Pohang University of Science and Technology (POSTECH) has developed a treatment for myocardial infarction using a mussel adhesive protein or MAP-based microneedle bandage that are attachable to the heart tissue.

MAPs incorporate biofunctional peptides derived from growth factors or extracellular matrix in the body. Growth factors are proteins involved in cell growth and differentiation, and extracellular matrix refers to the rest of the tissue excluding the cells.

The research team constructed a microneedle, a patch-type injection that is attached to the heart tissue to effectively deliver the biofunctional peptide to the damaged myocardial tissue. Silk fibroin protein, which displays excellent mechanical strength, was added to the tip of the microneedle to facilitate and accelerate its penetration to the surface of the myocardial tissue in the animal model.

“We have effectively delivered biofunctional peptides in an animal myocardial infarction using a mussel adhesive protein, a biomaterial that originated in Korea. This not only confirms the potentiality of the newly developed treatment for myocardial infarction, but also of its applicability to tissue regeneration treatment in similar environments”, said the researchers.

The MAP technology has undergone a technology transfer to Nature Glutech and clinical trials are in the works.