

세미나 초록

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발표 주제	헬스케어 응용을 위한 기능성 나노구조체
발표 내용	<p>Migration of implantable devices, such as stents, can cause serious complications, including injury and blockage. These issues worsen health outcomes by necessitating additional surgeries or interventions and increasing the risk of related medical problems. To address this issue, we developed a hydrogel-impregnated robust interlocking nano connector (HiRINC), which ensures strong adhesion and reduces the mechanical mismatch between self-expandable metallic stents (SEMSs) and surrounding tissue. Featuring a network-like porous layer, HiRINC significantly enhances adhesion and energy dissipation during peristalsis by utilizing mechanical interlocking and increased hydrogen bonding sites, thus securing SEMS to esophageal tissue. The anti-swelling property of HiRINC prevents excessive hydrogel expansion, avoiding esophageal blockage. Both ex vivo and in vivo adhesion tests confirm that the HiRINC outperforms hydrogel-coated flat surfaces, securing stent positioning and effective prevention of migration. Furthermore, HiRINC-coated SEMS maintains its position and luminal patency, minimizing stent-induced tissue hyperplasia and inflammatory responses in both rat and porcine esophageal models during the 4-week follow-up. This study supports the HiRINC-SEMS as a novel platform for the anti-migration and prolonged stent patency of endoluminal organs.</p>