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Taiwan unveils breakthrough targeted exosome platform for non-invasive spinal cord injury repair

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Facilitates intravenous, lesion-targeted delivery of BDNF mRNA and improved motor coordination in preclinical models



Taiwan-based China Medical University Hospital (CMUH), in collaboration with Ever Supreme International Biotechnology and Shine Out Bio Technology, has unveiled a targeted gene-engineered exosome platform for acute spinal cord injury (SCI) that enables intravenous, lesion-targeted delivery of brain-derived neurotrophic factor (BDNF) mRNA.

In preclinical models, the platform demonstrated significant improvement in motor coordination. Spinal cord injury remains one of the most challenging conditions in neurological medicine. According to the World Health Organization, the global incidence of spinal cord injury is estimated at 40 to 80 cases per million people each year, with many patients facing permanent disability and long-term rehabilitation. Existing treatment approaches often involve invasive procedures, while recovery outcomes remain suboptimal.

CMUH said the newly developed mBDNF@?ITG EV gene-engineered exosome platform is designed to address two major barriers in SCI treatment: the need for invasive local administration and the limited targeting ability of conventional exosomes. By using intravenous delivery, the platform is intended to guide therapeutic cargo to injured spinal cord tissue in a non-invasive manner.

The research team applied nanoengineering and genetic engineering strategies to create an exosome-based delivery system designed to selectively homing to injured spinal cord tissue after intravenous administration. The approach supports a more precise and less invasive regenerative treatment strategy for neural repair.