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Kidswell Bio Corporation (TSE:4584)

S-Quatre Corporation

PR Release

Joint Presentation on Research Findings Related to Spinal Cord Injury Treatment Using Next-Generation SHED

Tokyo, June 16, 2025 - Kidswell Bio Group is engaged in the research and development of novel cell-based therapies (regenerative medicine products) utilizing stem cells from human exfoliated deciduous teeth (SHED), with the aim of developing new treatments for pediatric and rare diseases for which no effective therapies currently exist.

Recently, the Department of Neurosurgery at Nagoya University Graduate School of Medicine ("Nagoya University") and our group company S-Quatre Corporation ("S-Quatre") jointly presented the results of their collaborative research at the 40th Annual Meeting of the Neurospinal Society of Japan, held from June 12 to 13, 2025. This academic conference serves as a major platform for sharing the latest research and treatment advancements in the field of spinal surgery. The presentation showcased the potential of next-generation (genetically modified) SHED as a groundbreaking treatment for spinal cord injury.

Spinal cord injury (SCI) is a condition caused by physical trauma to part of the spinal cord nerves, often resulting from accidents or falls, and leads to severe impairments in motor and sensory function. Patients suffering from SCI are often forced to live with significant physical limitations, such as paralysis and difficulty walking, for the rest of their lives. As such, there is a strong unmet need for therapeutic approaches that can help restore neurological function, even partially.

One of the major reasons SCI results in long-term disability is the occurrence of secondary injury—a pathological process in which inflammation triggered by the initial physical damage causes additional neural degeneration, thereby hindering the regeneration of neurons.

To address this challenge, S-Quatre and Nagoya University have been conducting joint research to develop a novel treatment using SHED. The initial findings from this research were published in January 2024. Building upon these results, the team has since been working on enhancing the therapeutic efficacy by developing a next-generation SHED that incorporates the NEUROD4 gene, referred to as ND4-SHED, and has continued to advance their research.

Highlights of the Research Findings

- Administration of SHED to rats with spinal cord injury led to a certain degree of improvement in motor function, however, a more pronounced effect was observed with ND4-SHED.
- Histopathological analysis revealed an increased presence of M2-type macrophages—which are associated with anti-inflammatory effects—in the spinal cord of rats treated with SHED. This increase was even more prominent in the group treated with ND4-SHED.
- In cell culture experiments, co-culturing macrophages with SHED induced M2 macrophage polarization, and this inductive capability was stronger in ND4-SHED compared to unmodified SHED.
- ND4-SHED demonstrated enhanced secretion of multiple protein factors related to immune modulation, compared to SHED without gene modification.
- These findings suggest that the introduction of the NEUROD4 gene into SHED enhances its innate immunomodulatory function—particularly its ability to promote M2 macrophage polarization—thereby potentially improving the recovery of motor function following spinal cord injury.