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China leads research of world's first spatiotemporal map of brain regeneration

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Previous research has only partially characterised which cells and pathways are involved in brain regeneration



A multi-institute research team led by China-based BGI Group has used BGI Stereo-seq technology to construct the world first spatiotemporal cellular atlas of the axolotl (*Ambystoma mexicanum*) brain development and regeneration, revealing how a brain injury can heal itself.

The research team analyzed the development and regeneration of salamander brain, identified the key neural stem cell subsets in the process of salamander brain regeneration, and described the reconstruction of damaged neurons by such stem cell subsets.

At the same time, the team also found that brain regeneration and development have certain similarities, providing assistance for cognitive brain structure and development, and offering new directions for regenerative medicine research and treatment of the nervous system.

By comparing the molecular change during the development and regeneration of the salamander brain, researchers found that the formation process of neurons is highly similar during both development and regeneration. This result indicates that brain injury may induce neural stem cells to reversely transform into an early developmental state to initiate the regeneration process.

In addition to BGI, researchers from China, the United States, and Denmark, including Guangdong Provincial People's Hospital, South China Normal University, WuhanUniversity, School of Life Sciences at University of Chinese Academy of Sciences, Shenzhen Bay Laboratory, Whitehead Institute, University of Copenhagen, and other institutes participated in this study which received ethical approval and used laboratory-grown axolotl.