Docket #: S22-462

Secreted Particle Information Transfer (SPIT) - a cell based in vivo genetic engineering platform

Researchers at Stanford University have developed a novel platform for genetically engineering cells within a living organism, circumventing previous limitations related to accessing target tissues and the size of the genetic payload.

The ability to genetically engineer cells, whether in vivo or ex vivo, has emerged as a promising treatment approach for a wide range of conditions, including cancers and anemias. However, despite their therapeutic potential, extending these engineering techniques to a broader spectrum of diseases has been challenging due to limitations in targeting hard-to-reach tissues and delivering larger segments of genetic material. This has hindered the widespread adoption of cell engineering as a standard treatment modality.

Now, Professor Hiromitsu's group has developed a solution that can overcome these issues. Their platform called **S**ecreted **P**article **I**nformation **T**ransfer (SPIT), allows the engineering of genetic information in vivo with the use of a novel delivery vesicle, opening up a wider range of potential use cases for cell engineering.

Stage of Development
Proof of concept

Applications

- Cell engineering in vivo:
    - Altering genotypes
    - Altering epigenetic state
    - Reduction of aging
    - Delivery of genetic information (e.g. mRNA vaccine)

Advantages

- Better access to all tissue types
- More complex in vivo genetic engineering
- Potential of multiplexed genetic engineering
- Longer term genetic engineering after a single dose
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Patents

- Published Application: WO2025137322

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