

PLENARY LECTURE

Messenger RNA as a new drug modality

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Messenger RNA (mRNA) is a new promising modality for vaccines and drugs. Not only the flexibility for designing the nucleic acid sequences to produce various proteins, mRNA has advantages such as availability for any cell type with negligible risk of insertional mutagenesis. Now the mRNA is chiefly used for vaccines for infectious diseases including COVID-19 and other infectious diseases, but also the vaccines for cancer immunotherapy are under development¹, which leads to personalized medicine that offers therapy based on a detailed knowledge of the characteristics of each individual's specific cancer. In addition, mRNA is available for therapeutic purposes such as hereditary diseases², cancer, and the tissue engineering³⁻⁵. For developing mRNA vaccines and medicines, three elements, the mRNA engineering, DDS, and the ideas of medical applications based on understanding of disease states, are equally important, which would require interdisciplinary efforts over medicine, pharmaceutical science, and engineering.

In this presentation, I would like to briefly present the history and the current status of developing mRNA vaccines and drugs, including our own trials for the treatment of articular cartilage and the brain diseases. Then, I would like to discuss on the future perspective of the mRNA vaccines and drugs.

References

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