REVIEW ARTICLE | POWERPOINT SUMMARY

Yiru ZHANG · Wei YU · Wenlong DING · Shixian LIN

Journal of Zhejiang University-SCIENCE B 2026 27(10):1041-1058 https://doi.org/10.1631/jzus.B2600331

Sense Codon Reassignment

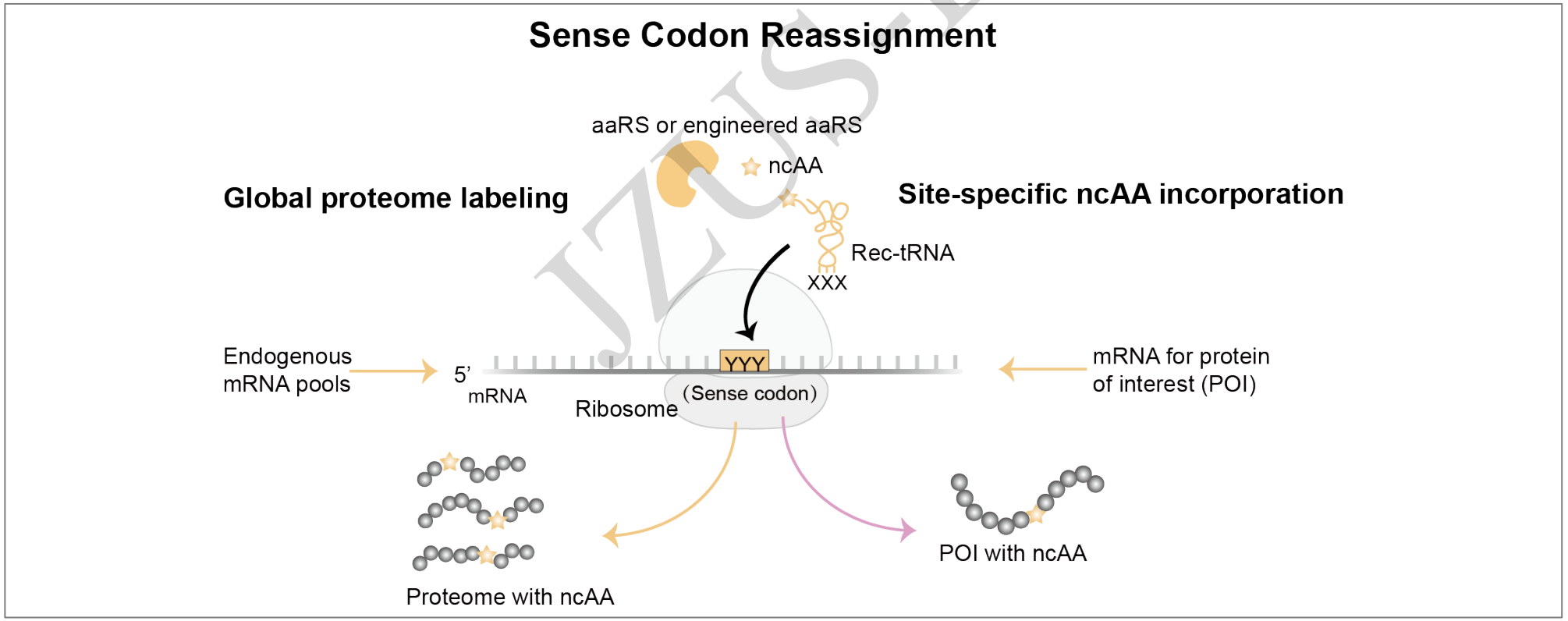
From Global Proteome Profiling to Precision Protein Engineering

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Key words: Sense codon reassignment; Genetic code expansion; Stochastic orthogonal recoding of translation; Rare codon; Orthogonal translation system

Research Summary

By manipulating endogenous decoding competition, sense codon reassignment supports applications ranging from global proteome labeling with endogenous synthetases or SORT to site-specific ncAA incorporation through rare codon recoding and genome-scale creation of blank coding channels.



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Innovation points

1 — **Global labeling landscape**

Integrates endogenous/engineered synthetase-based labeling and programmable SORT for proteome-wide ncAA incorporation.

2 — **Precision encoding spectrum**

Organizes site-specific strategies by reducing endogenous competition through rare codon recoding or eliminating it through blank coding channels.

3 — **Unified comparison framework**

Compares BONCAT/SPI, SORT, rare codon recoding, and genome-recoded organisms across mechanisms, host compatibility, specificity, limitations, and applications.

4 — **Dual-route integration**

Connects proteome-wide stochastic labeling with site-specific precision engineering through their shared use of sense codon reassignment.

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