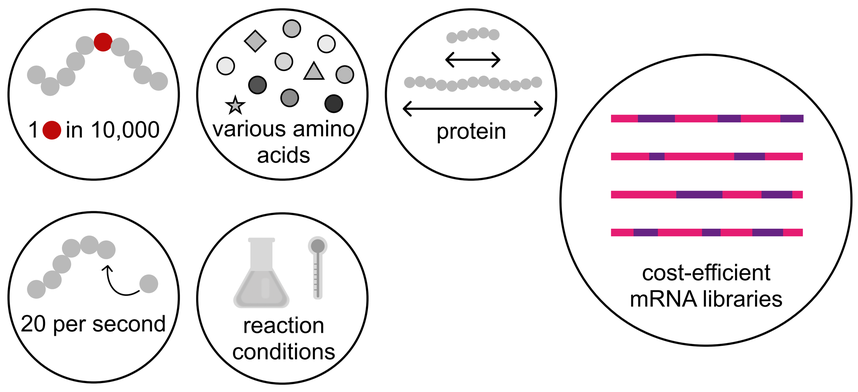
Towards the improvement of non-canonical amino acid incorporation via Decoupled Synthesis of Ribosomes (DeSyR)

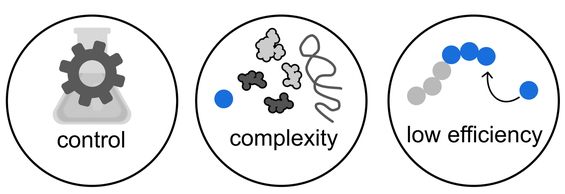
*Benedikt Golisch**†, *Anton Meier*†, *Martin J. Weissenborn*†



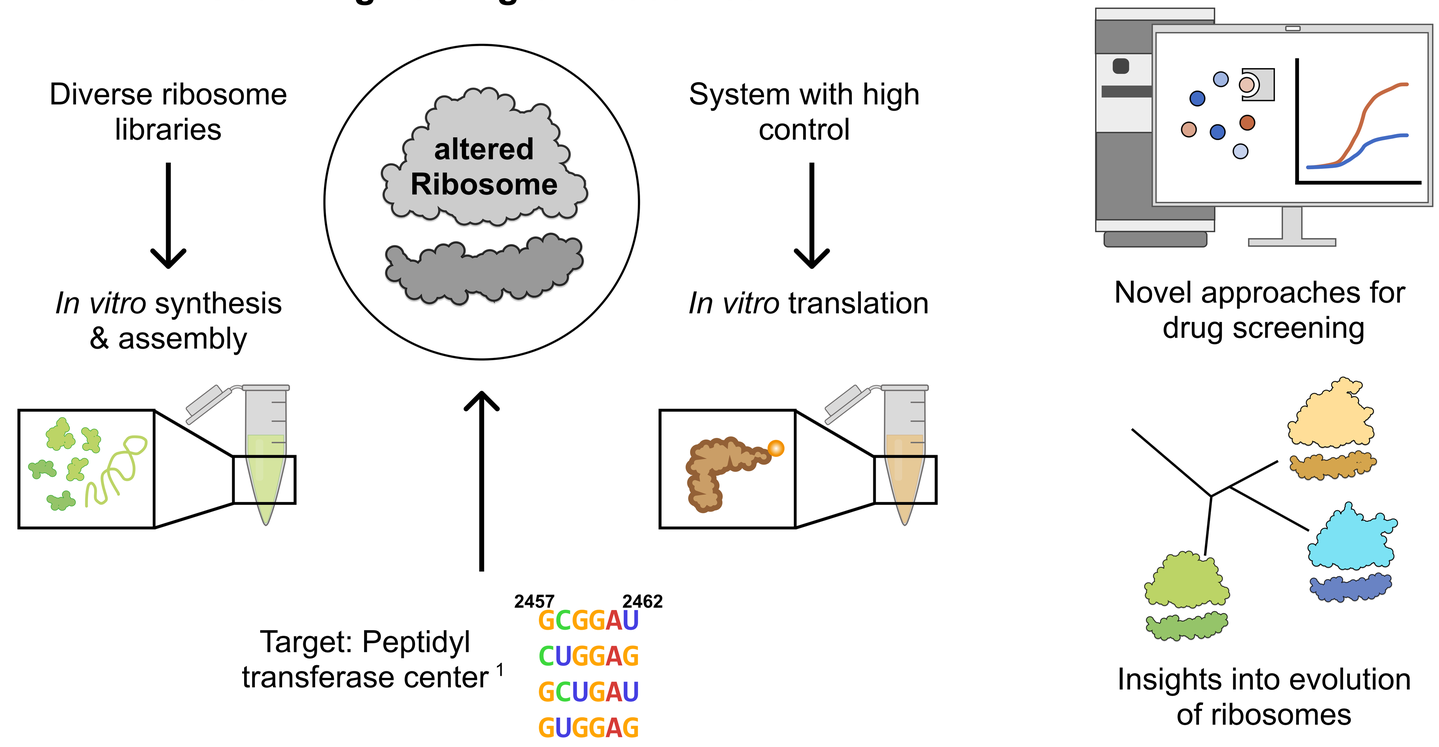
Advantage of ribosomal peptide synthesis



Disadvantage of ribosomal peptide synthesis

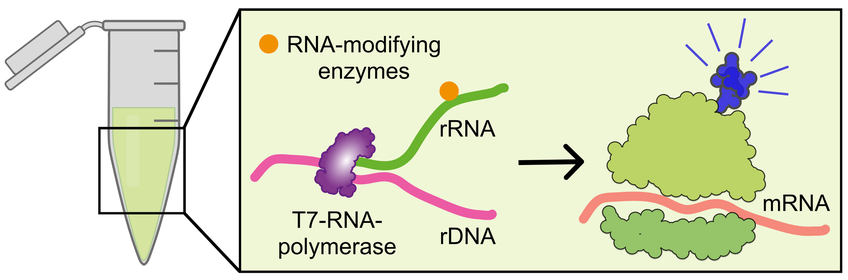


Goal: Engineering of ribosomes



Decoupled Synthesis of Ribosomes (DeSyR)

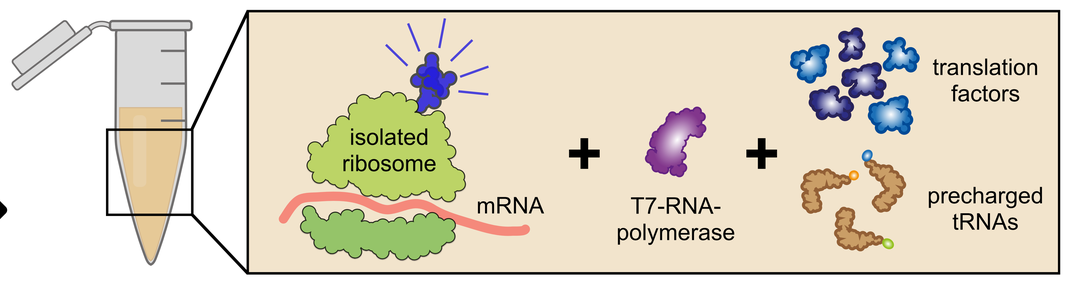
In vitro synthesis of active ribosomes



Cell extract based iSAT (integrated synthesis, assembly & translation)[2]

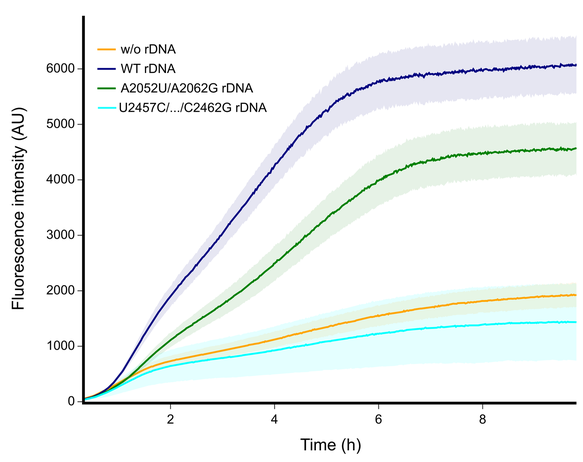
Ribosome isolation via ultracentrifugation

In vitro translation

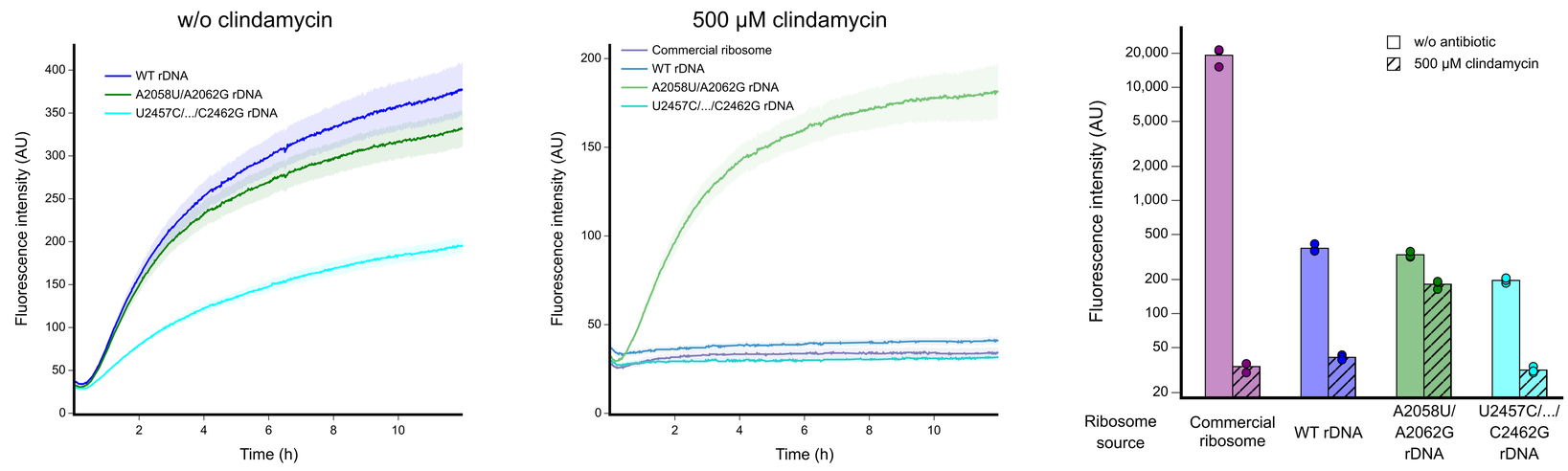


PURE system (Protein synthesis Using Recominant Elements)[3]

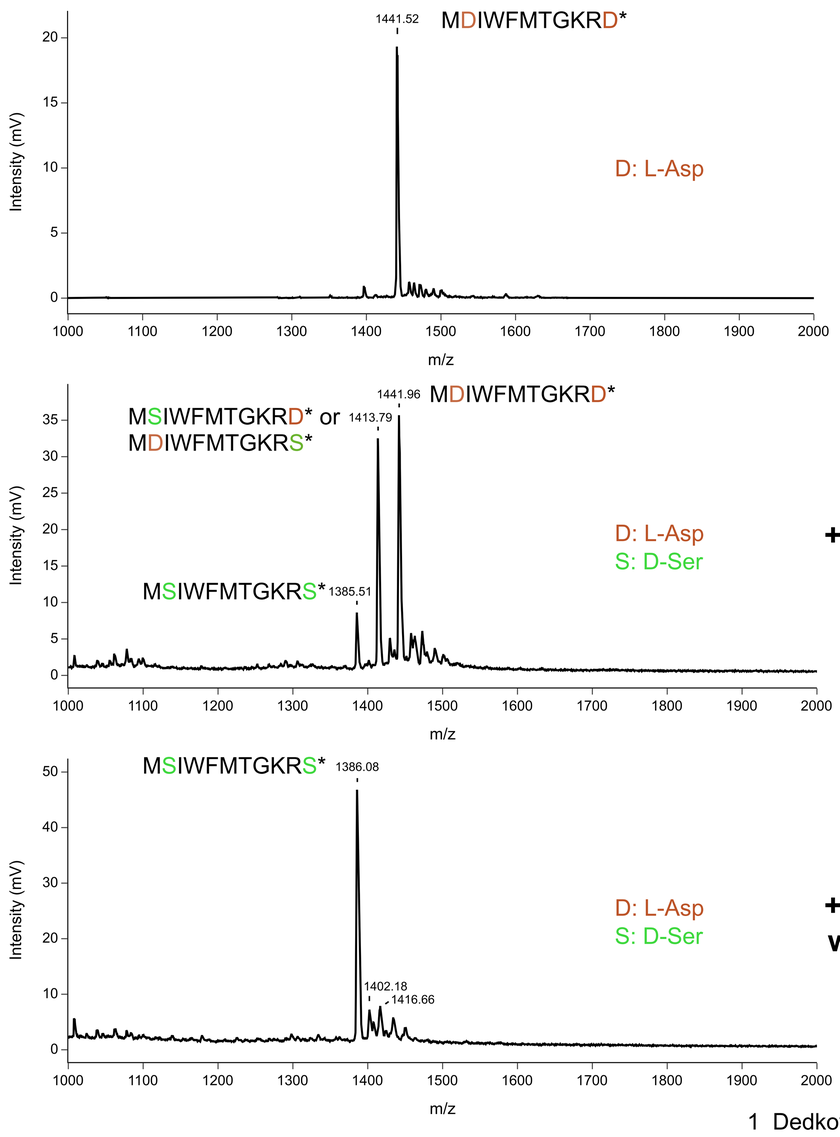
Successful synthesis of WT ribosome and a double mutant monitored via GFP-translation



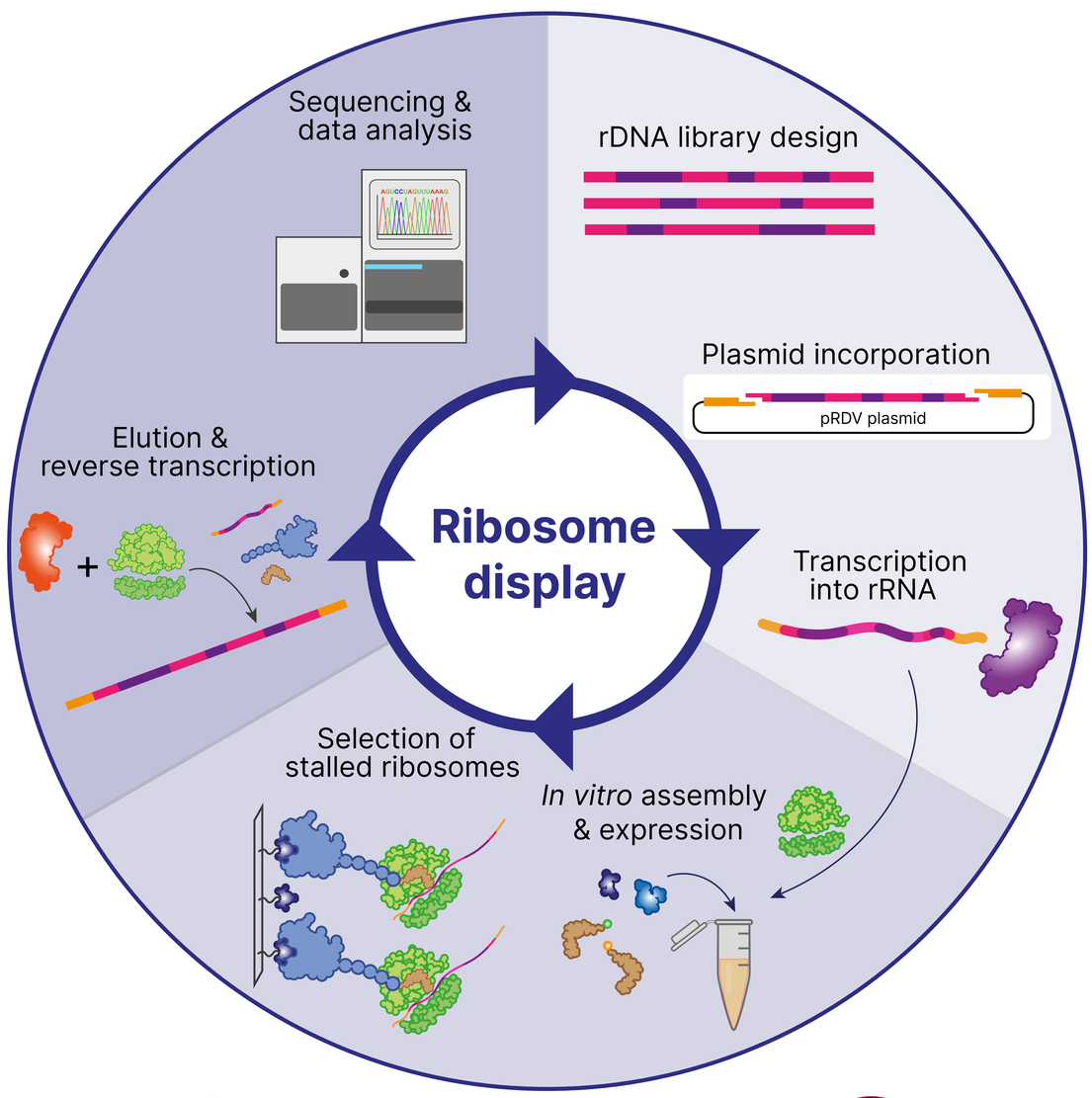
Activity of 1.5 µM isolated ribosomes using PURExpress



Incorporation of D-amino acids



Outlook: Ribosome engineering[4]



Available under https://doi.org/10.17952/38EPS.2026.P300

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1 Dedkova *et al.*, JACS, 2013.

2 Jewett *et al.*, Molecular systems biology, 2013.

3 Shimizu *et al.*, Nature biotechnology, 2001.

4 Hammerling *et al.*, Nature Communications, 2020.

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