Re-cycling cyclic peptides through peptidyl-tRNA drop-off

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During translation, the escape of peptidyl-tRNA from the P-site, called peptidyl-tRNA drop-off happens, which is believed to be essential in all living forms. This "loss in translation" has been known for a long time, but our understanding on peptidyl-tRNA drop-off was limited. We found that the site of peptidyl-tRNA drop-off could be pinpointed in translation of histone H3 N-terminal tail, which can facilitate the studies on peptidyl-tRNA drop-off. Using Histone H3 tails as a model peptide, we here show that codon reprogramming method can be successfully utilized to help understanding peptidyl-tRNA drop-off, and some of preliminary results regarding the event are presented. We also show that a simple twist in idea that "utilizes" peptidyl-tRNA drop-off can be used to synthesize cyclic peptides and possibly proteins using an example of sunflower trypsin inhibitor-1.