

## Effect of translation rate on the efficiency of programmed nonsense-suppression

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### Abstract

Chemical diversity of protein molecules can be expanded through the in vitro incorporation of unnatural amino acids in response to a nonsense codon. Chemically misacylated tRNAs are used for tethering unnatural amino acids to a nonsense-mutated target codon (programmed suppression). In the course of experiments to introduce S-(2-nitrobenzyl)cysteine (NBC) into targeted location of human erythropoietin (hEPO) molecule, we found that the suppression efficiency was inversely affected by the translation rate of target protein. Therefore, the yield of nonsense-suppressed hEPO was dependent on both the overall productivity and the efficiency of NBC incorporation. Even though the detailed mechanism needs to be explored further, our present result will offer a preliminary guideline to optimize the reaction conditions for in vitro production of protein molecules containing unnatural amino acids.

### References

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