

Gene Expression

VaxPress: a codon optimizer for mRNA vaccine design

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Abstract

Motivation: mRNA vaccines have emerged as a promising alternative to traditional vaccine technologies due to their potential for rapid and scalable production. This makes them especially suitable for addressing sporadic infectious diseases and for use as personalized cancer vaccines. For optimal efficiency, it's crucial to enhance translation efficiency, in vivo stability, immunogenicity, and storage stability by a careful design of the mRNA sequence. While the codon adaptation index (CAI) and minimum free energy (MFE) structures are vital for design, many other factors influence the overall antigen production in vaccine recipients.

Results: VaxPress is a codon optimizer targeted for optimal antigen expression in mRNA vaccines. Its user-friendly interface and diverse package distributions facilitate easy integration across different contexts and locations. Additionally, its pluggable scoring system allows users to easily incorporate their unique optimization strategies in sequence design.

Availability: VaxPress is open-source, licensed under the MIT license, and can be accessed on GitHub, PyPI, and Anaconda.

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Supplementary information: Supplementary data are available at *Bioinformatics* online.

1 Introduction

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This work has been supported by the... Text Text Text Text.

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