

Strategi Ekspresi dan Purifikasi Protein Rekombinan Tat-Eli HIV-1 menggunakan *Escherichia coli* = Strategy of Expression and Purification Tat-Eli HIV-1 recombinant protein using *Escherichia coli*

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Abstrak

Protein Transaktivator transkripsi (Tat) adalah protein regulator HIV-1 berfungsi sebagai aktivator transkripsi genom HIV-1. Varian protein Tat-Eli adalah aktivator transkripsi paling kuat daripada varian lain melalui induksi promotor LTR HVI-1. Kemampuan tersebut digunakan sebagai kontrol positif dalam pengembangan uji infeksiivitas HIV-1 berbasis gene reporter eGFP diregulasi LTR HIV-1. Pengembangan uji infeksiivitas tersebut menawarkan waktu deteksi infeksi lebih singkat daripada uji p24 pada uji fenotipik. Penelitian ini bertujuan untuk mengekspresikan protein rekombinan Tat-Eli di sistem ekspresi prokariot dan mempurifikasinya sehingga dapat dijadikan kontrol positif penginduksi promotor. Pada penelitian ini dilakukan pengklonaan gen sintetik Tat-Eli ke vektor pQE80L. Protein rekombinan Tat-Eli dipurifikasi menggunakan Ni-NTA. Pengklonaan ulang gen reporter eGFP disisipkan setelah promotor LTR HIV-1. Aktivitas protein rekombinan Tat-Eli terhadap ekspresi eGFP di sel mamalia dinilai berdasarkan persentase sel pengeksresi eGFP dan intensitas cahaya eGFP. Konstruksi plasmid rekombinan membawa gen Tat-Eli, pQETat, berhasil dibuat, diekspresikan dan dipurifikasi kondisi native. Plasmid pengeksresi eGFP dengan promotor HIV-1, pLReGFP berhasil dikonstruksi. Penambahan Tat-Eli rekombinan pada sel mamalia yang ditransfeksi pLReGFP menunjukkan perbedaan intensitas cahaya eGFP yang bermakna dan paling tinggi dari semua perlakuan. Protein rekombinan Tat-Eli dapat diekspresikan dan dipurifikasi secara optimal dari *E. coli*. Penambahan protein Tat-Eli pada sel yang ditransfeksi pLReGFP meningkatkan intensitas cahaya eGFP.

.....Transcriptional Transactivator Protein (Tat) is an HIV-1 regulatory protein functioning as an activator of HIV-1 genome transcription. The Tat-Eli protein variant was the most potent transcriptional activator than other variants through the induction of the HVI-1 LTR promoter. This ability was used as a positive control in the development of an HIV-1 infection test based on the eGFP reporter gene regulated by LTR HIV-1. The development of the infectiousness test offers a shorter infection detection time than the p24 test in the phenotypic test. This study aims to express Tat-Eli recombinant protein in the prokaryotic expression system and to purify it so that it can be used as a positive control inducer of the promoter. In this study, synthetic Tat-Eli gene was cloned into the pQE80L vector. Tat-Eli recombinant protein was purified using Ni-NTA. Recloning of the eGFP reporter gene was inserted after the HIV-1 LTR promoter. The activity of Tat-Eli recombinant protein on eGFP expression in mammalian cells was assessed based on the percentage of eGFP-expressing cells and eGFP light intensity. The recombinant plasmid construction carrying the Tat-Eli gene, pQETat was successfully generated, expressed and purified in native conditions. An eGFP-expressing plasmid with HIV-1 promoter, pLReGFP was successfully constructed. The addition of recombinant Tat-Eli to mammalian cells transfected with pLReGFP showed a significant difference in eGFP light intensity and was the highest of all treatments. Tat-Eli recombinant protein can be optimally expressed and purified from *E. coli*. The addition of Tat-Eli protein in pLReGFP-transfected cells increased eGFP light intensity.