



$$TE_{uORF,i} = \frac{RPF_{uORF,i}}{mRNA_{uORF,i}} \quad TE_{CDS,i} = \frac{RPF_{CDS,i}}{mRNA_{CDS,i}}$$

$$\beta_i = \frac{TE_{uORF,i}}{TE_{CDS,i}}$$

$$\begin{aligned} & \log_2(TE_{uORF,i}) \pm SE_{\log_2(TE_{uORF,i})} \\ & \log_2(TE_{CDS,i}) \pm SE_{\log_2(TE_{CDS,i})} \end{aligned}$$

Wald test

$$\begin{aligned} SE_{\log_2(\beta_i)} &= \sqrt{SE_{\log_2(TE_{uORF,i})}^2 + SE_{\log_2(TE_{CDS,i})}^2} \\ P(\beta_i \neq 1) &= 2 \cdot \left(1 - \Phi \left(\left| \frac{\log_2(\beta_i)}{SE_{\log_2(\beta_i)}} \right| \right) \right) \end{aligned}$$

$$mRNA_{uORF,i} = 100 \quad mRNA_{CDS,i} = 1000$$

$$RPF_{uORF,i} = 50 \quad RPF_{CDS,i} = 2000$$

$$TE_{uORF,i} = 0.5 \quad TE_{CDS,i} = 2$$

$$\beta_i = 0.25$$

$$SE_{\log_2(TE_{uORF,i})} = 0.366$$

$$SE_{\log_2(TE_{CDS,i})} = 0.156$$

$$SE_{\log_2(\beta_i)} = 0.398$$

$$P(\beta_i \neq 1) = 4.9 \times 10^{-7}$$