

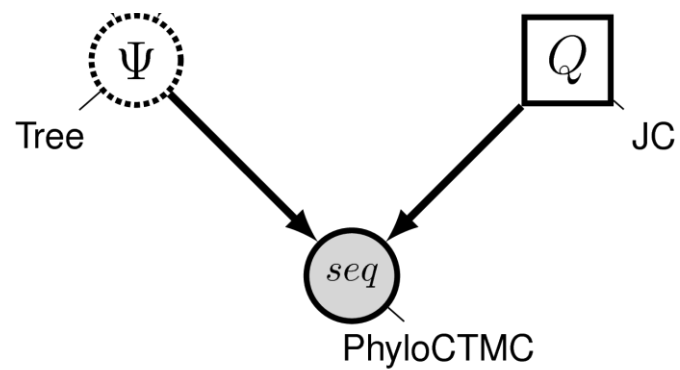
# BCB 503: RevBayes Intro



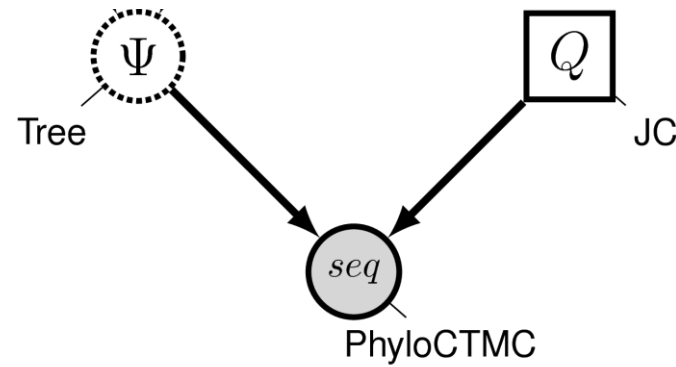
## Sixth session: Tree Building & Dating

Orlando Schwery, 19. Oct. 2021, University of Idaho

# Jukes-Cantor Nucleotide Substitution Model

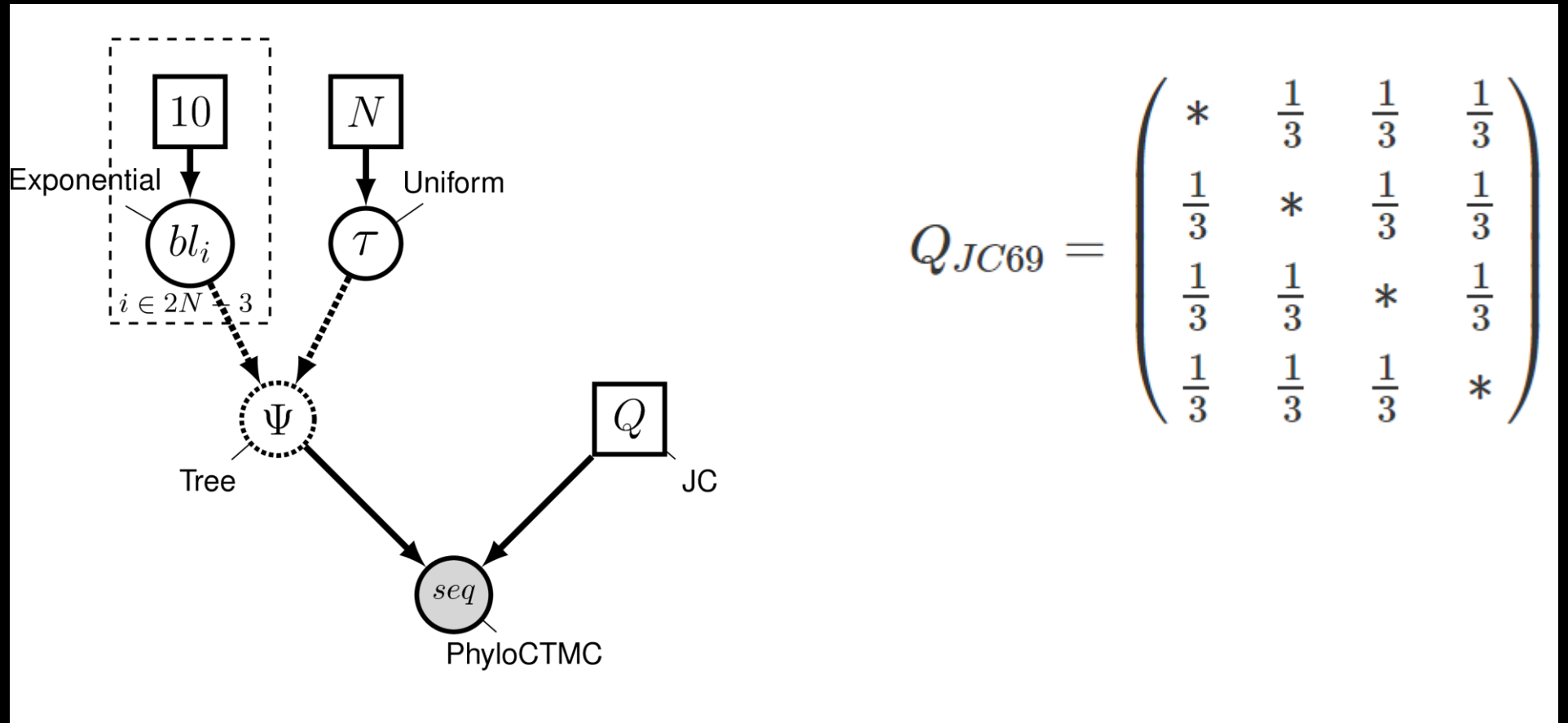


# Jukes-Cantor Nucleotide Substitution Model

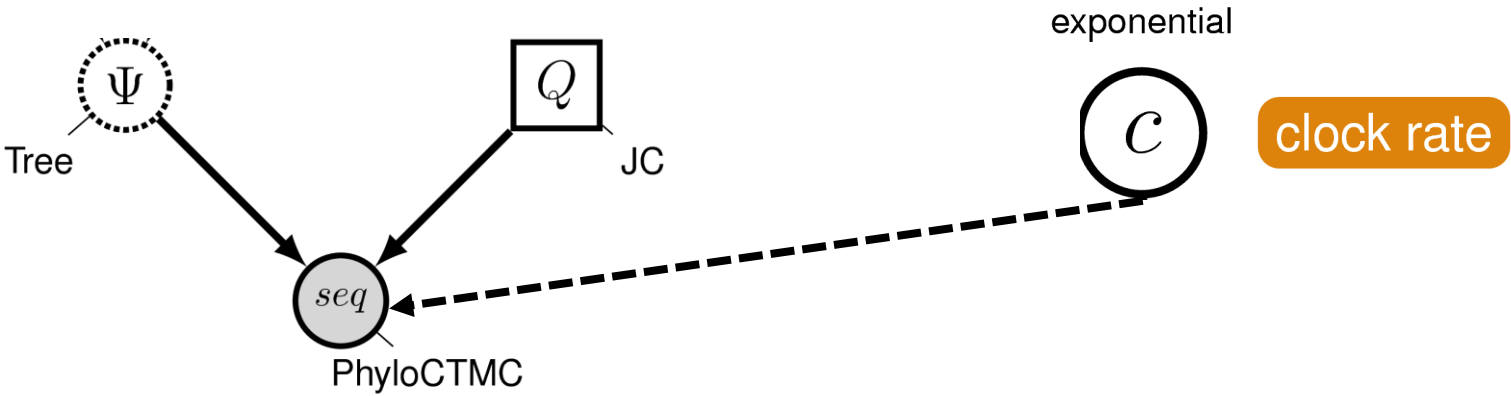


$$Q_{JC69} = \begin{pmatrix} * & \frac{1}{3} & \frac{1}{3} & \frac{1}{3} \\ \frac{1}{3} & * & \frac{1}{3} & \frac{1}{3} \\ \frac{1}{3} & \frac{1}{3} & * & \frac{1}{3} \\ \frac{1}{3} & \frac{1}{3} & \frac{1}{3} & * \end{pmatrix}$$

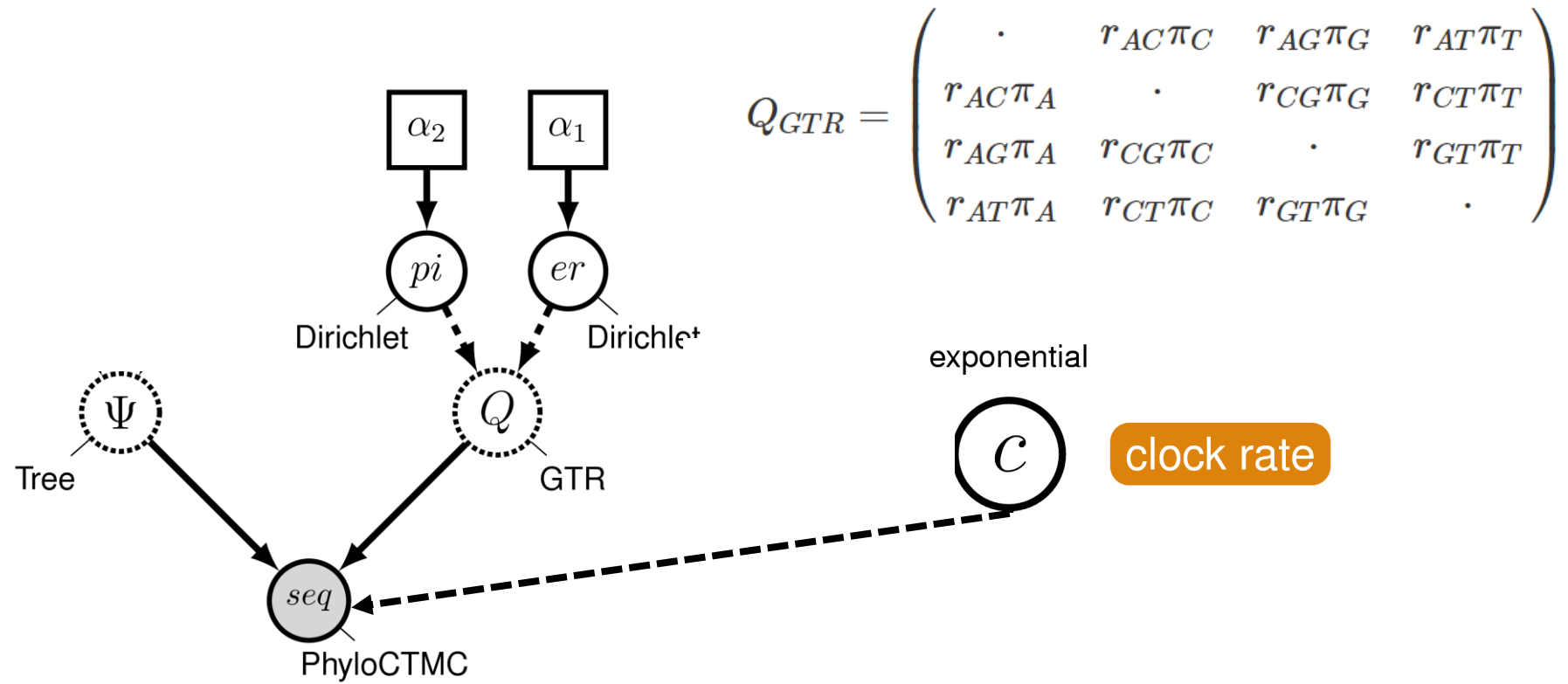
# Jukes-Cantor Nucleotide Substitution Model



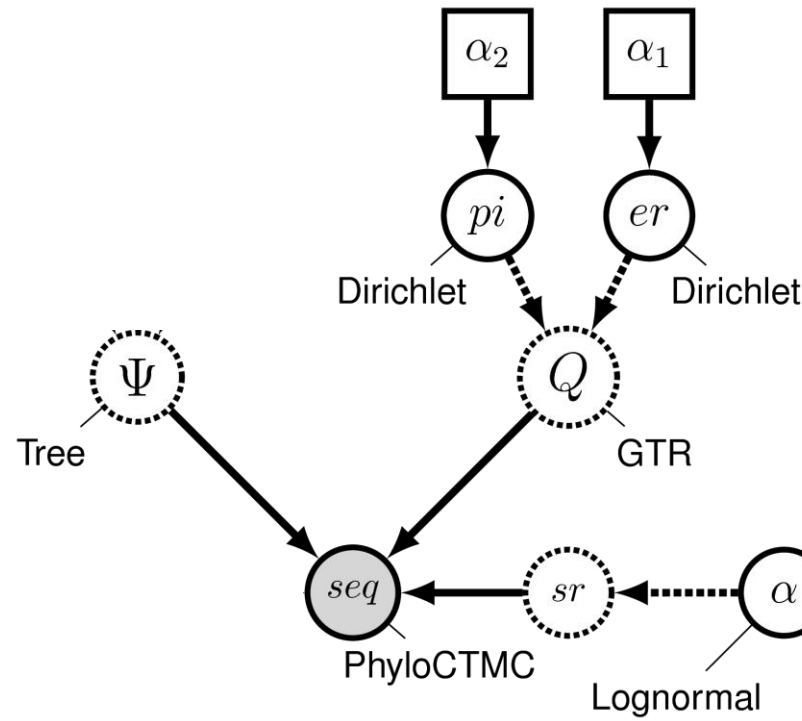
# Adding Clock Rate



# GTR Nucleotide Substitution Model

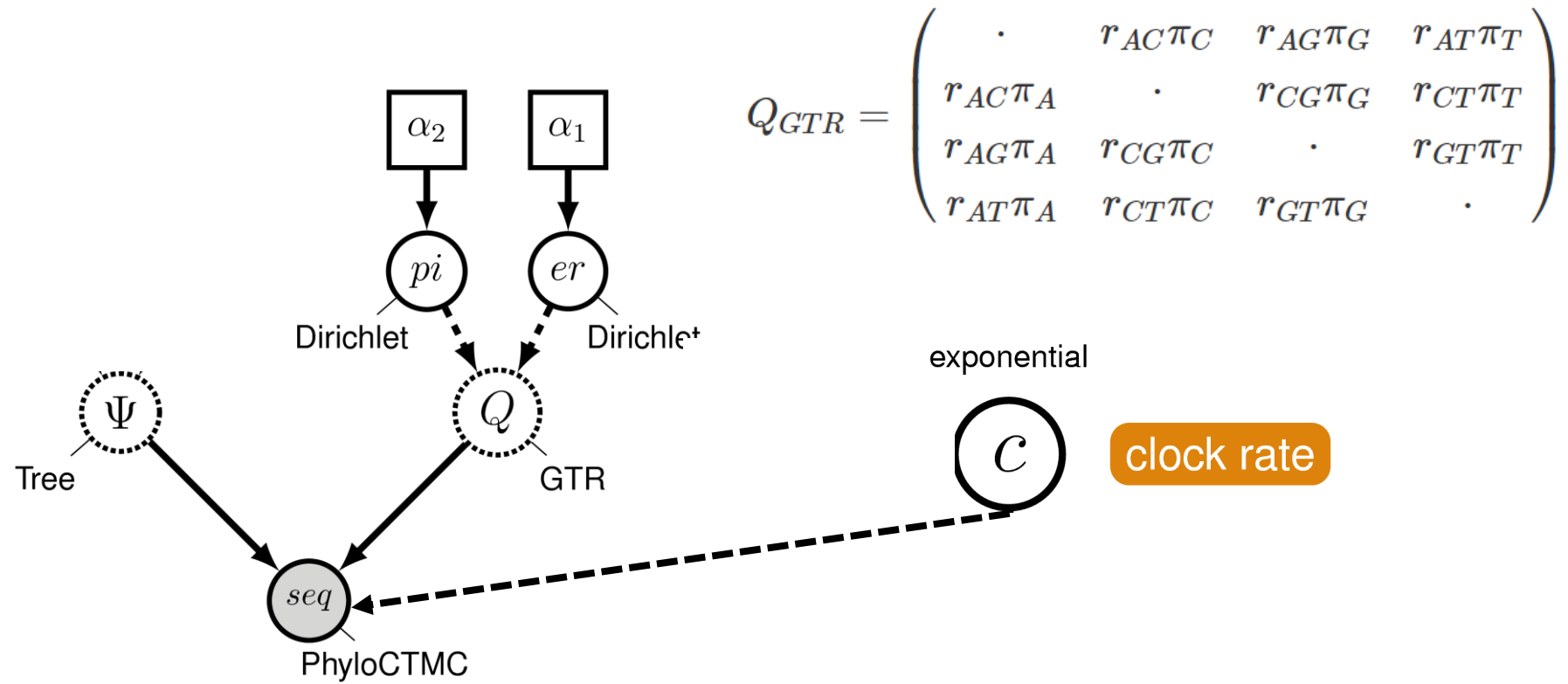


# GTR+gamma Nucleotide Substitution Model



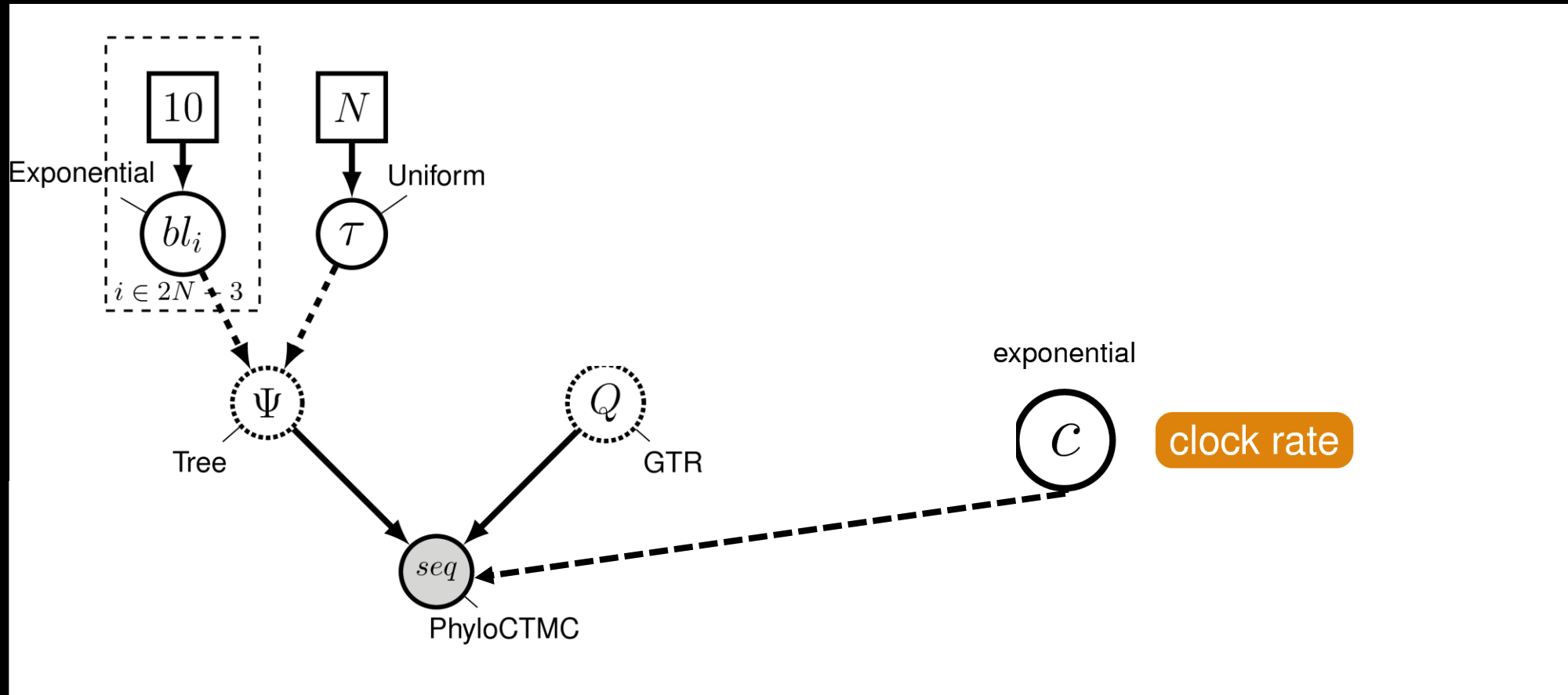
$$Q_{GTR} = \begin{pmatrix} \cdot & r_{AC\pi C} & r_{AG\pi G} & r_{AT\pi T} \\ r_{AC\pi A} & \cdot & r_{CG\pi G} & r_{CT\pi T} \\ r_{AG\pi A} & r_{CG\pi C} & \cdot & r_{GT\pi T} \\ r_{AT\pi A} & r_{CT\pi C} & r_{GT\pi G} & \cdot \end{pmatrix}$$

# GTR Nucleotide Substitution Model

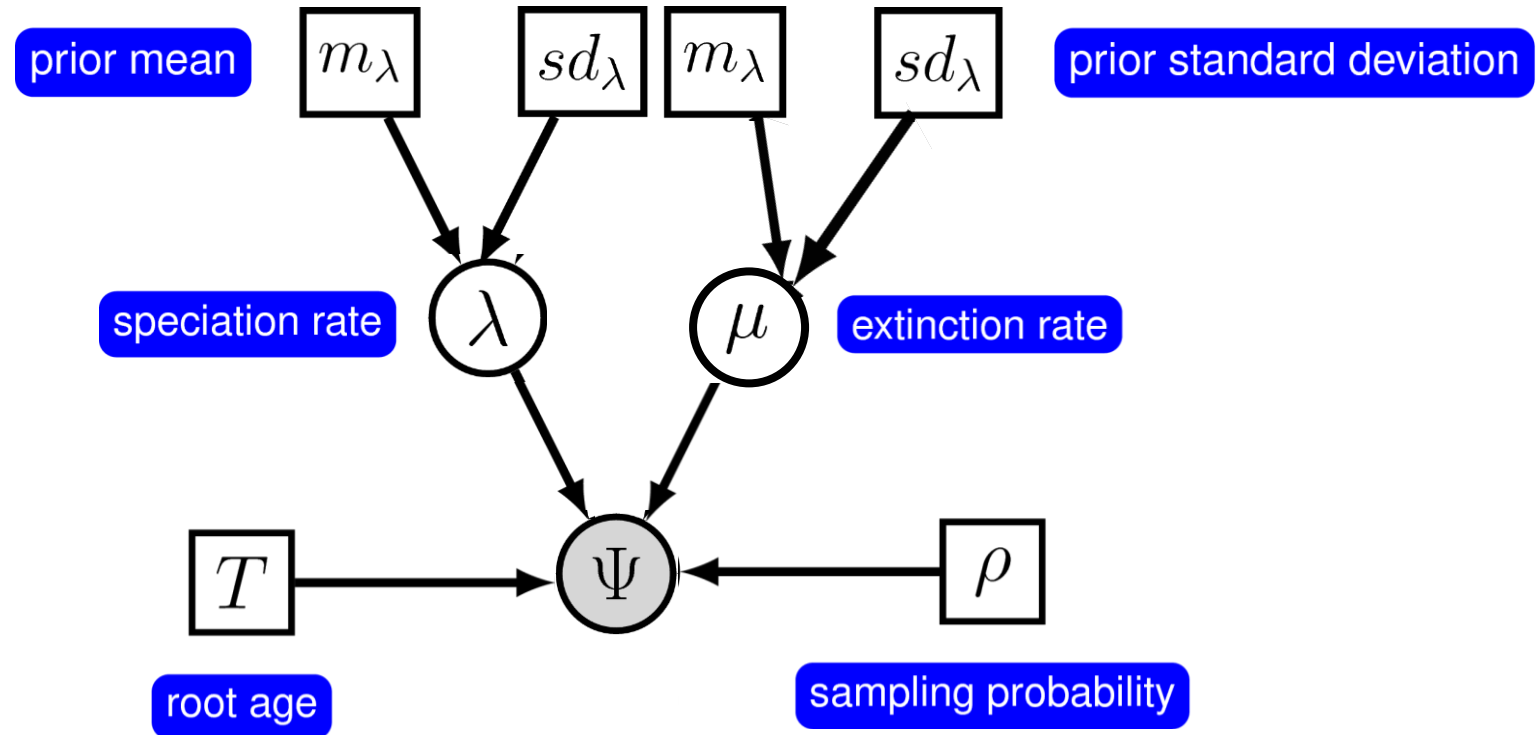




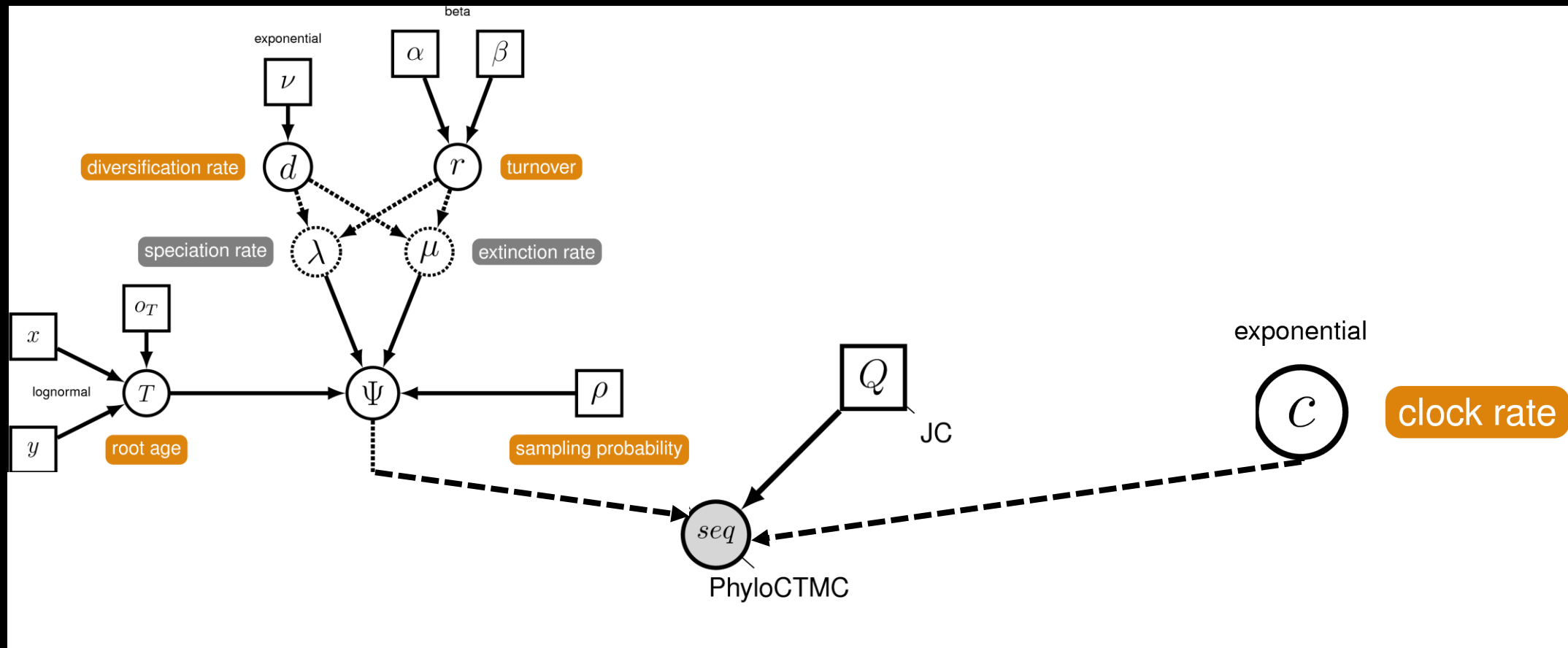
# Tree Model



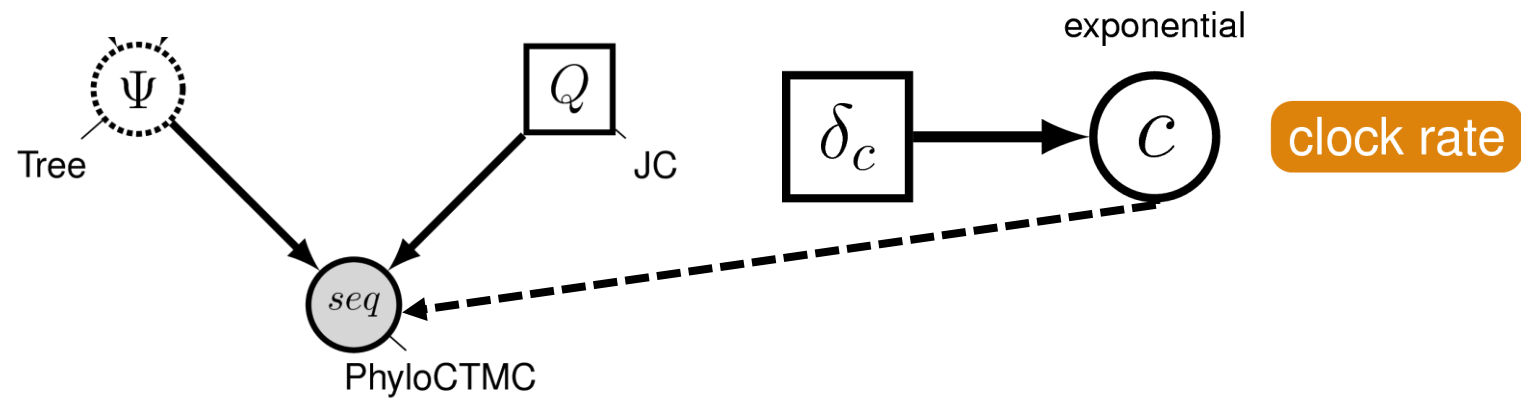
# BD



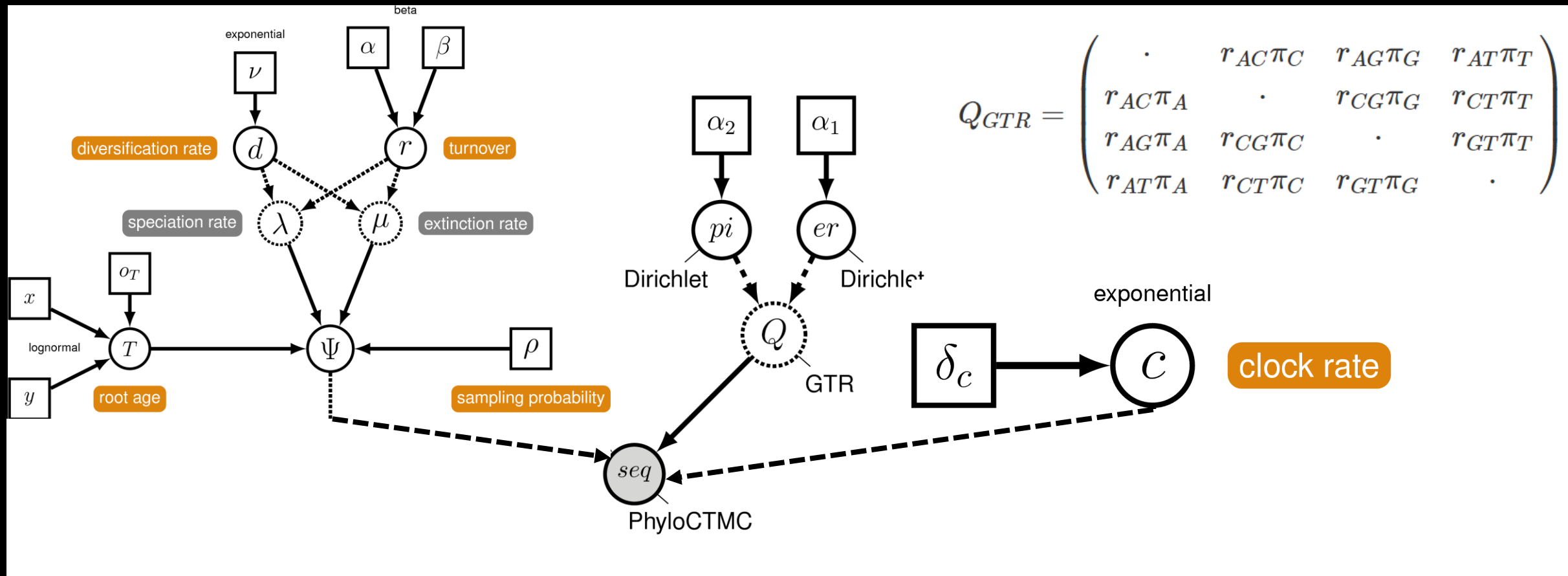
# Global Molecular Clock with BD tree model



# Global Molecular Clock



# BD – GTR – Global Molecular Clock



# BD – GTR – Relaxed Molecular Clock

