

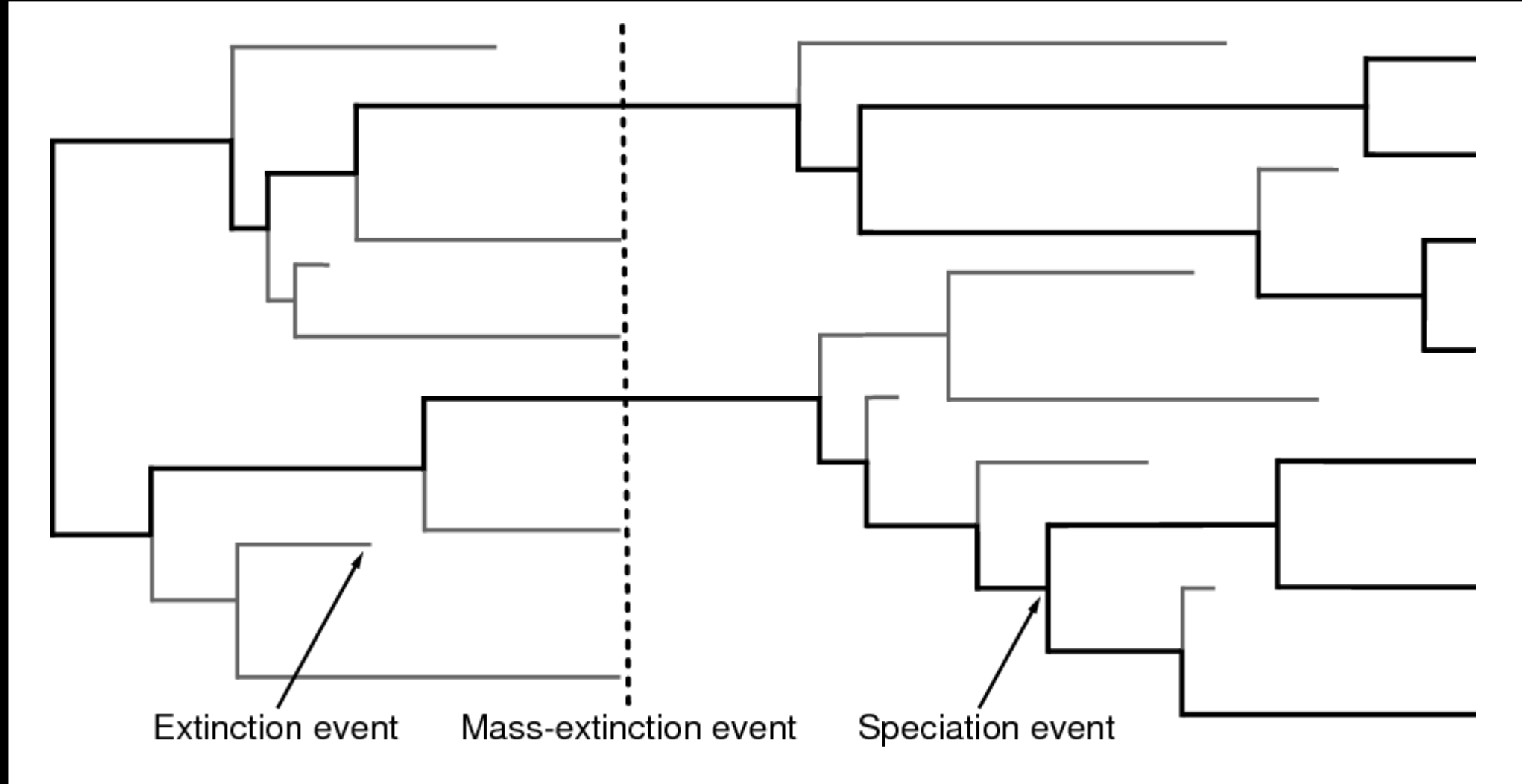
BCB 503: RevBayes Intro



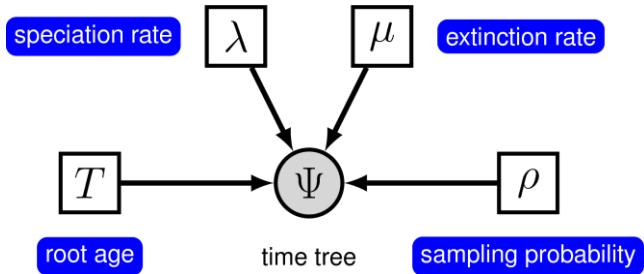
Fifth session: Diversification-Add-On

Orlando Schwery, 12. Oct. 2021, University of Idaho

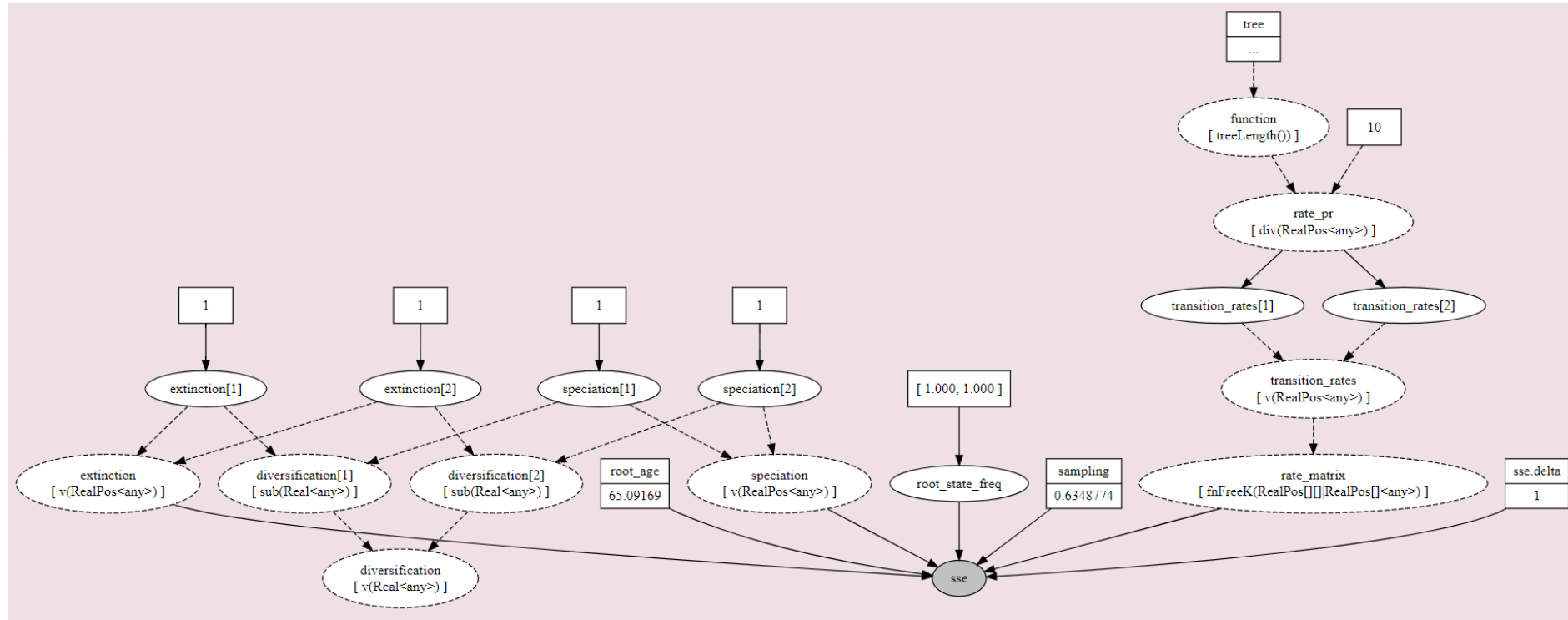
Birth Death Models



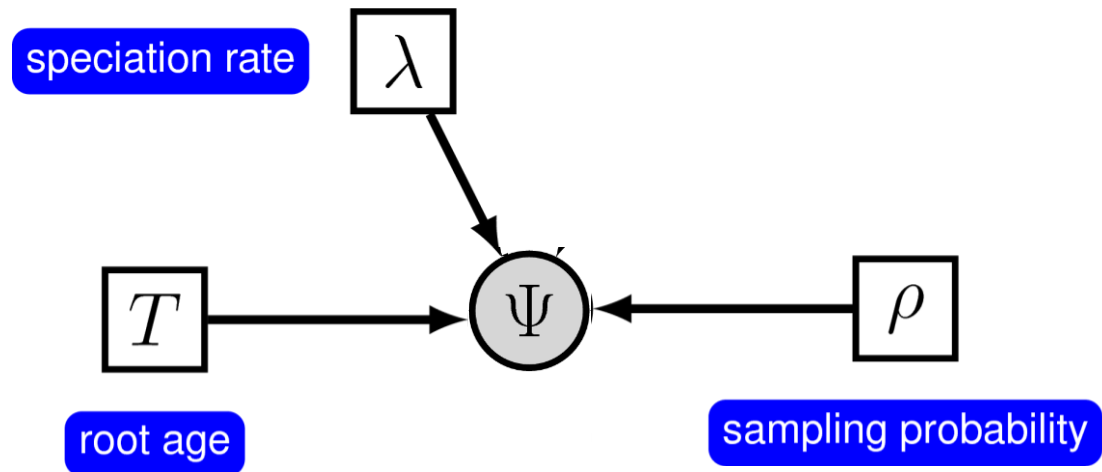
Binary State Speciation & Extinction



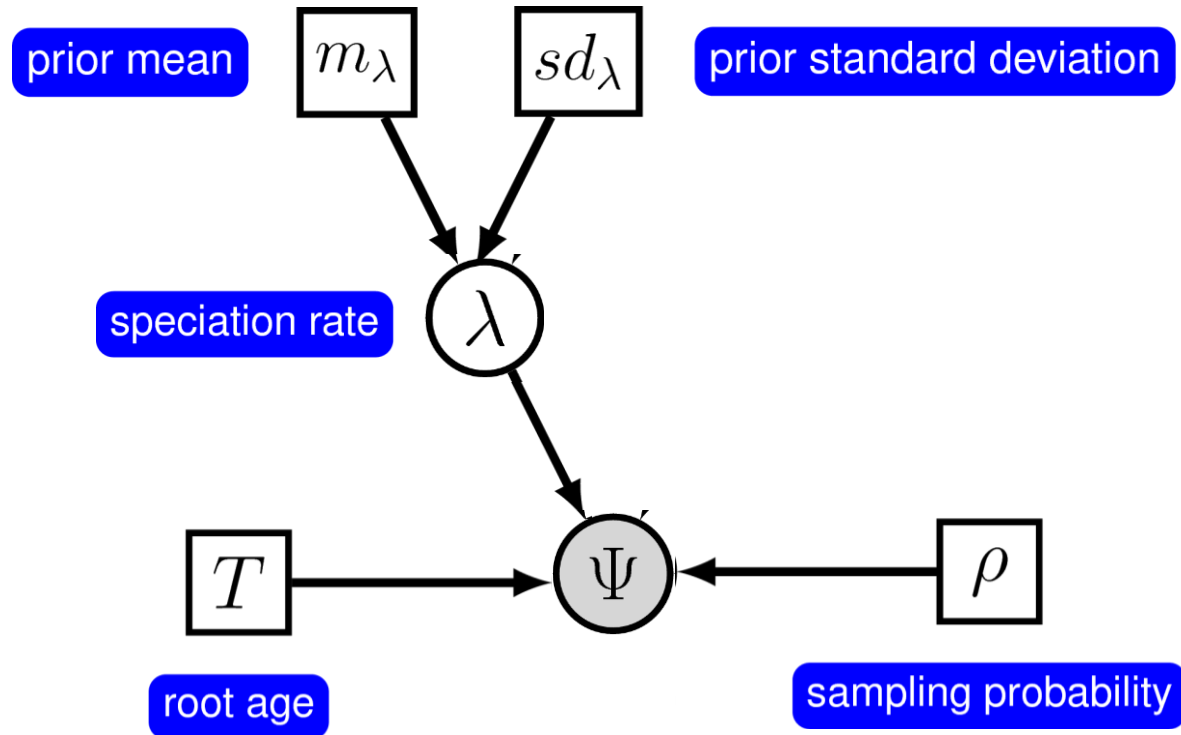
Parameter	Interpretation
Ψ	Phylogenetic tree with divergence times
T	Root age
q_{01}	Rate of transitions from 0 to 1
q_{10}	Rate of transitions from 1 to 0
λ_0	Speciation rate for state 0
μ_0	Extinction rate for state 0
λ_1	Speciation rate for state 1
μ_1	Extinction rate for state 1



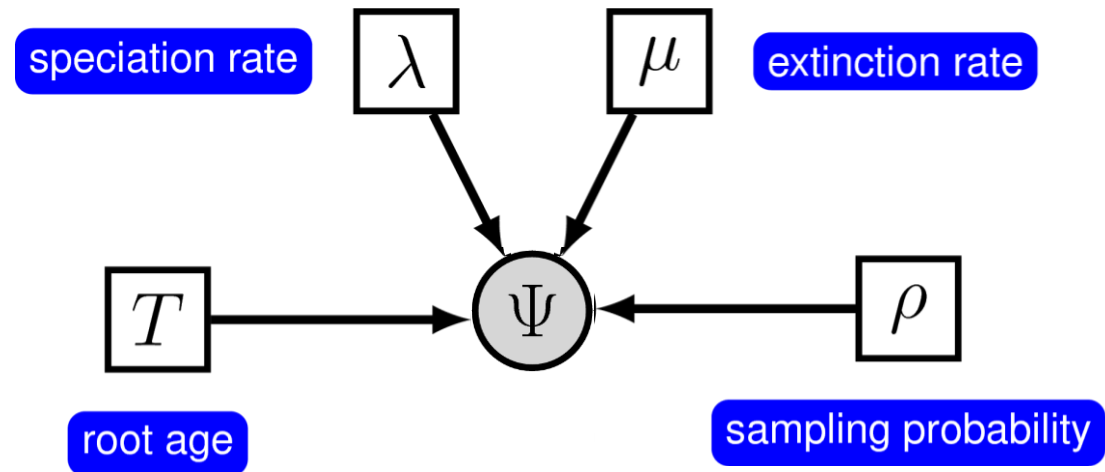
Yule



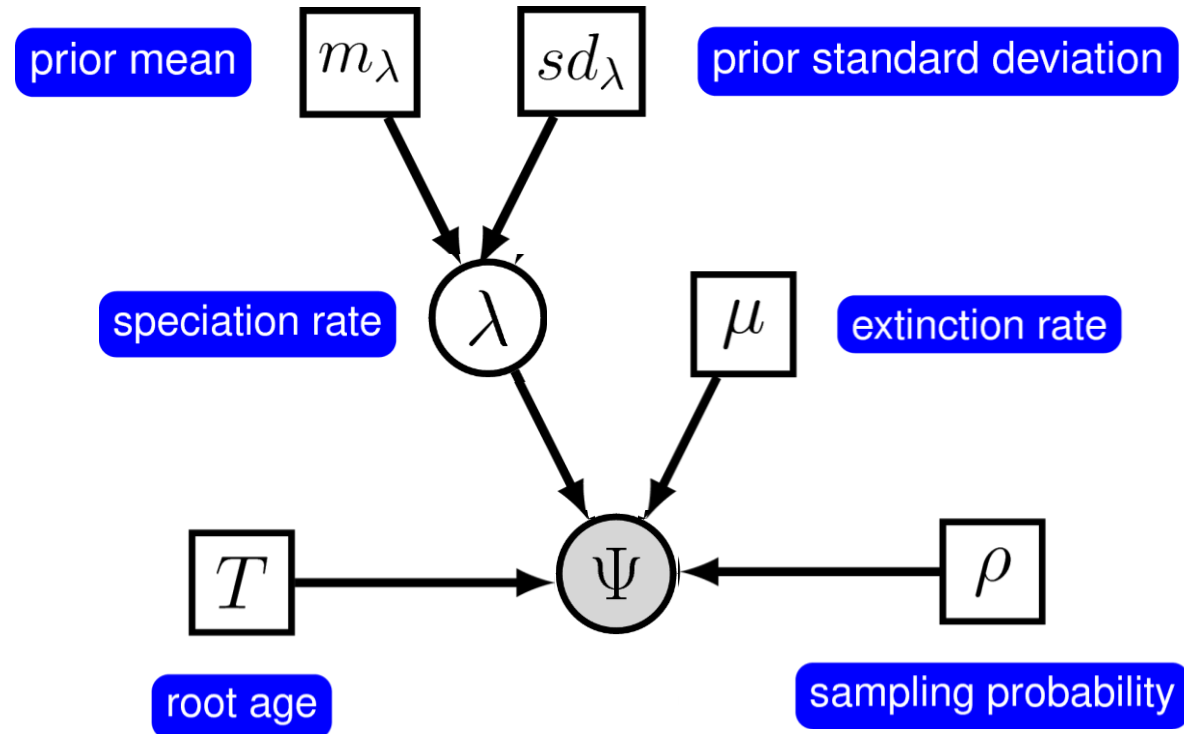
Yule – prior on lambda



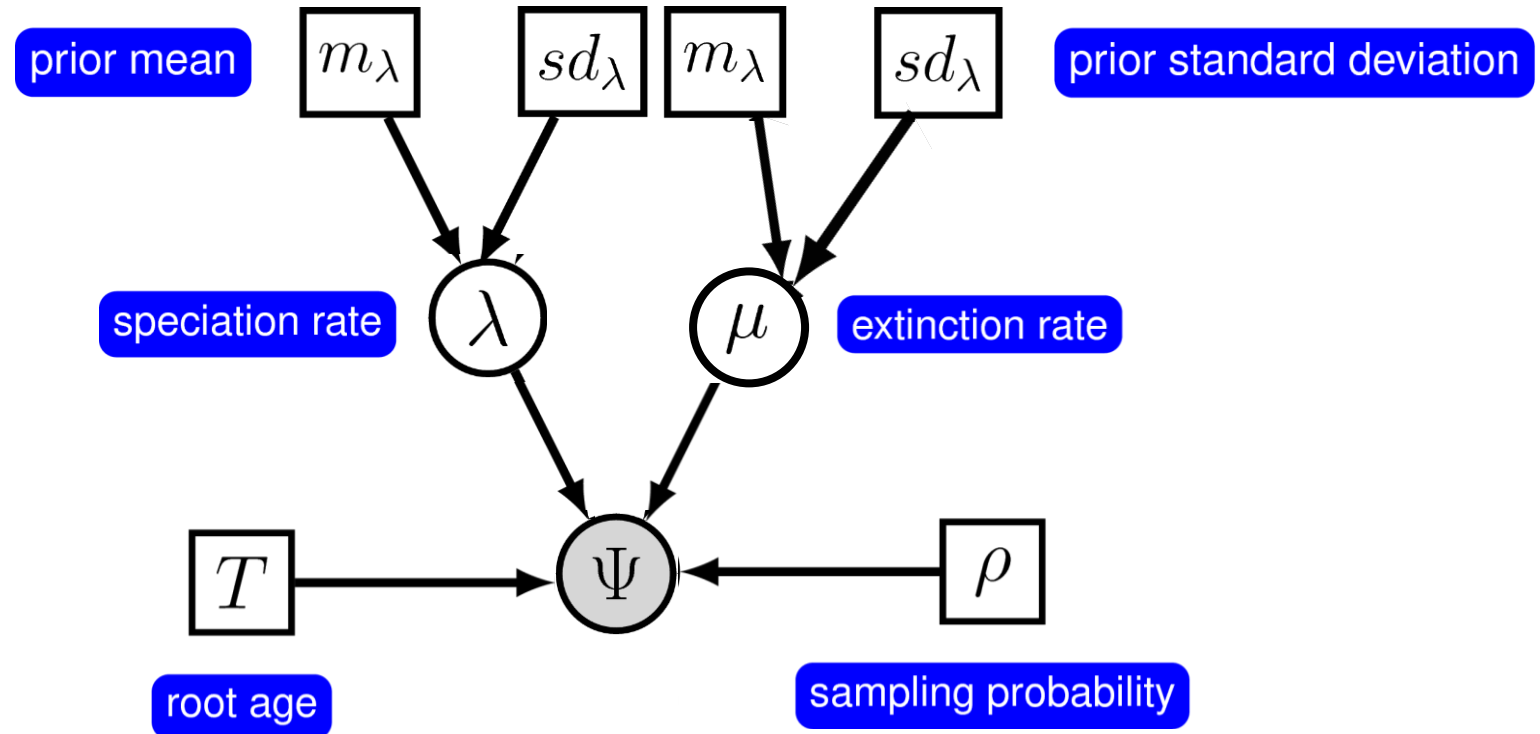
BD



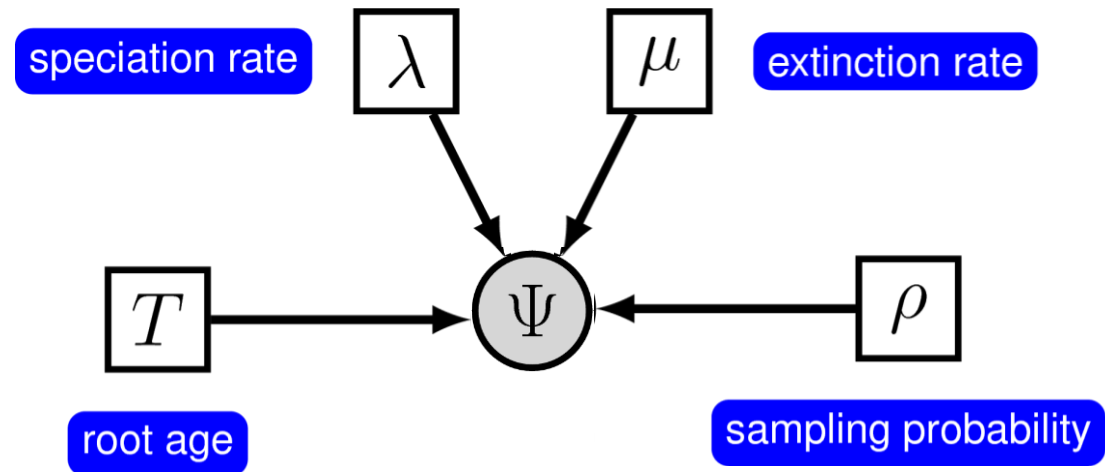
BD – prior on lambda



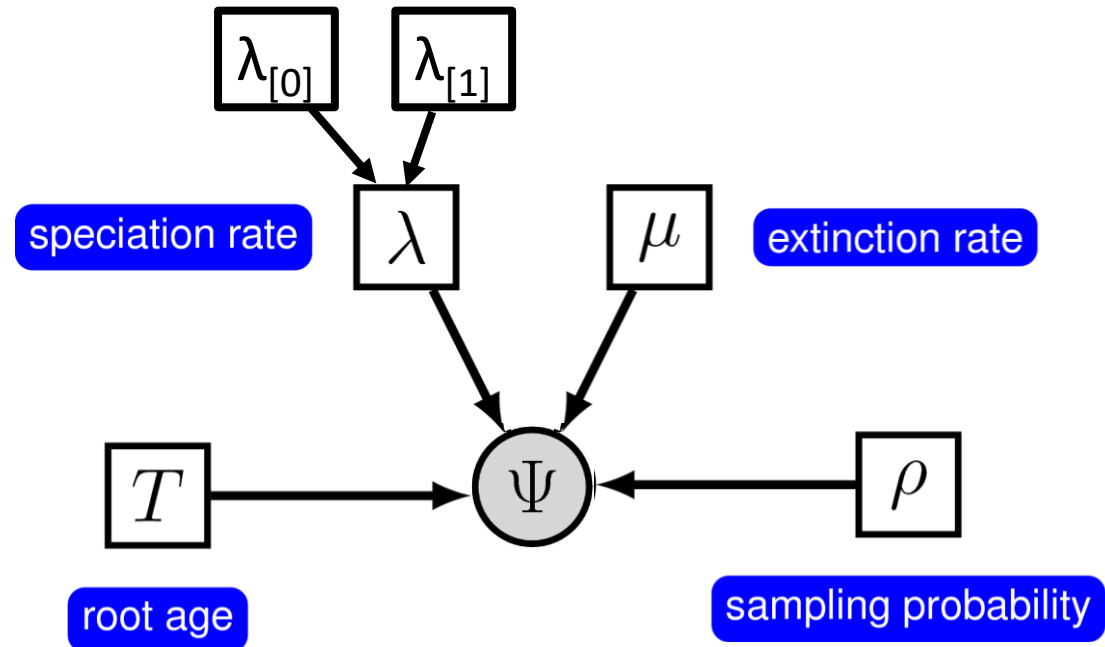
BD – prior on mu



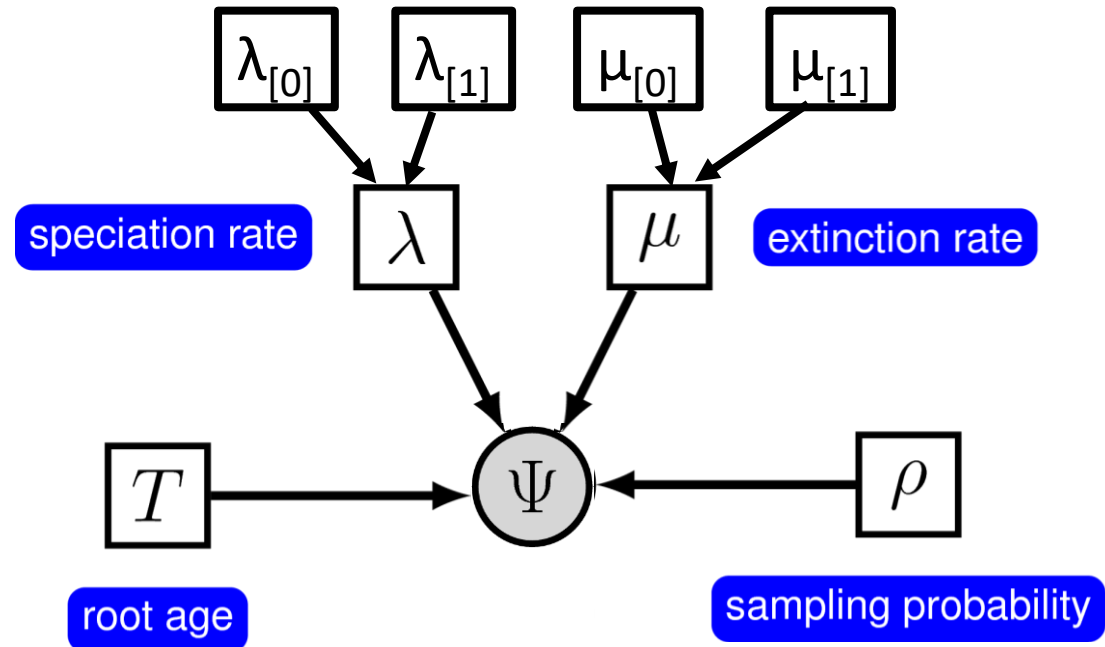
BD to BiSSE



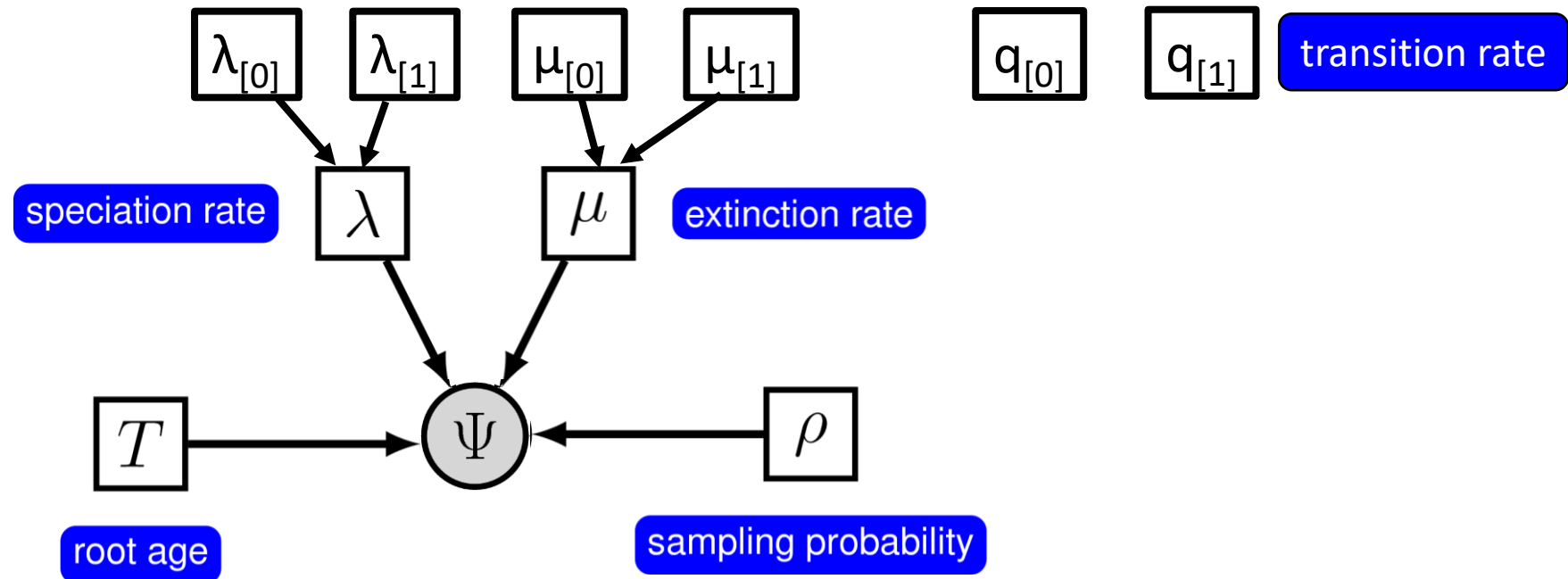
BD to BiSSE - lambdas



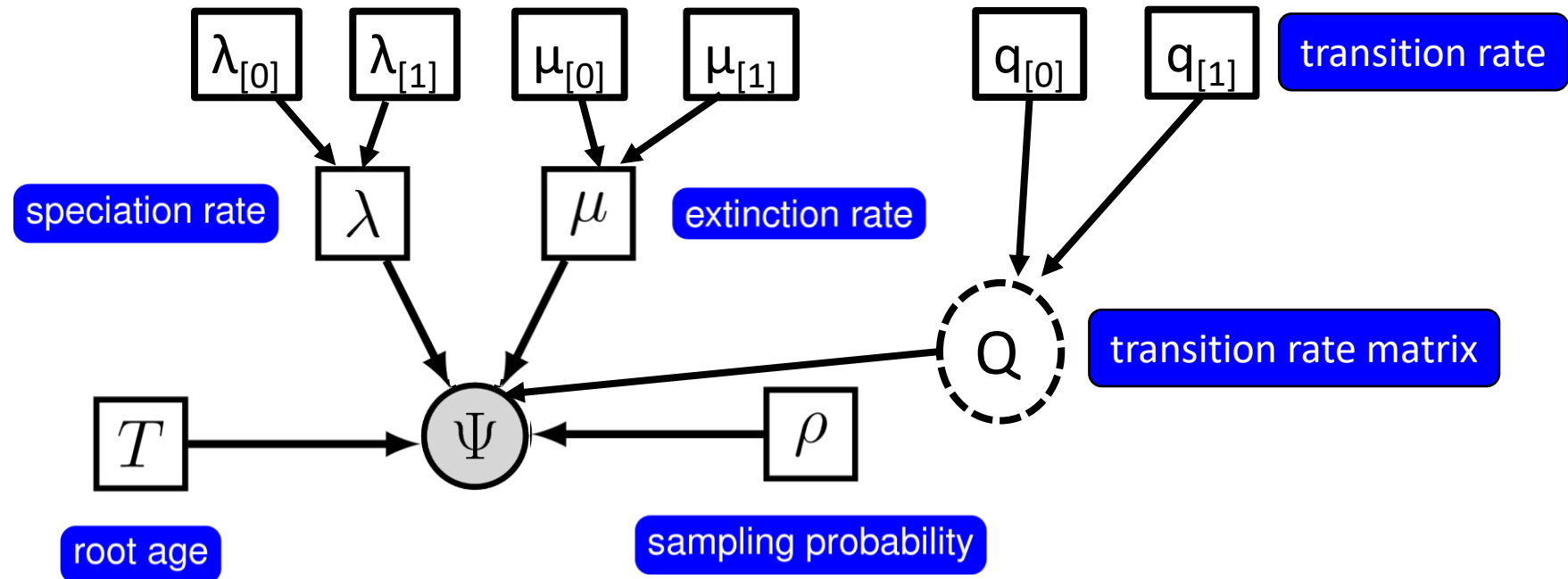
BD to BiSSE - mus



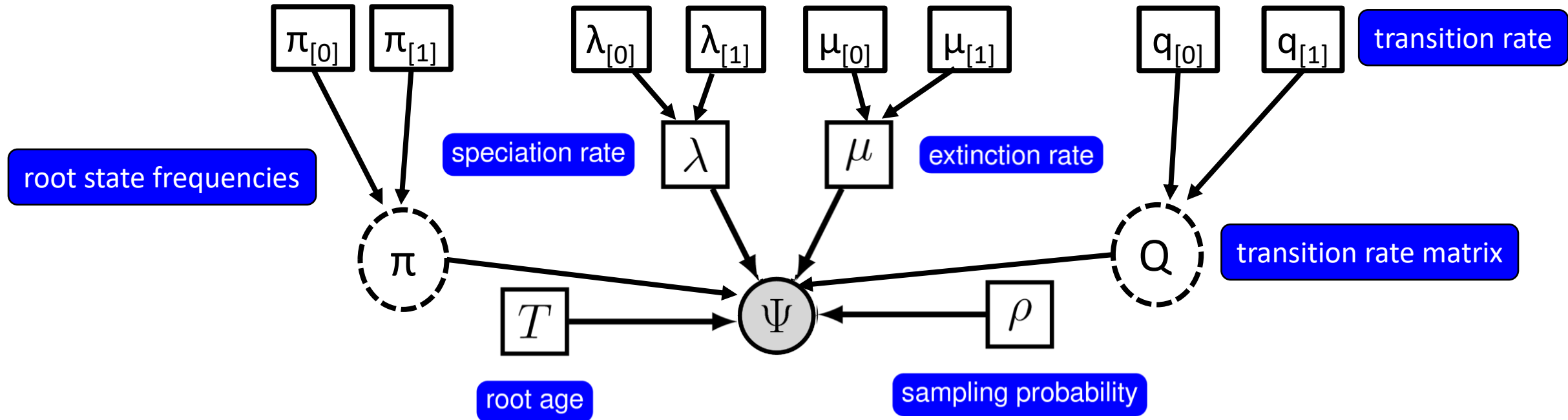
BD to BiSSE – transition rates



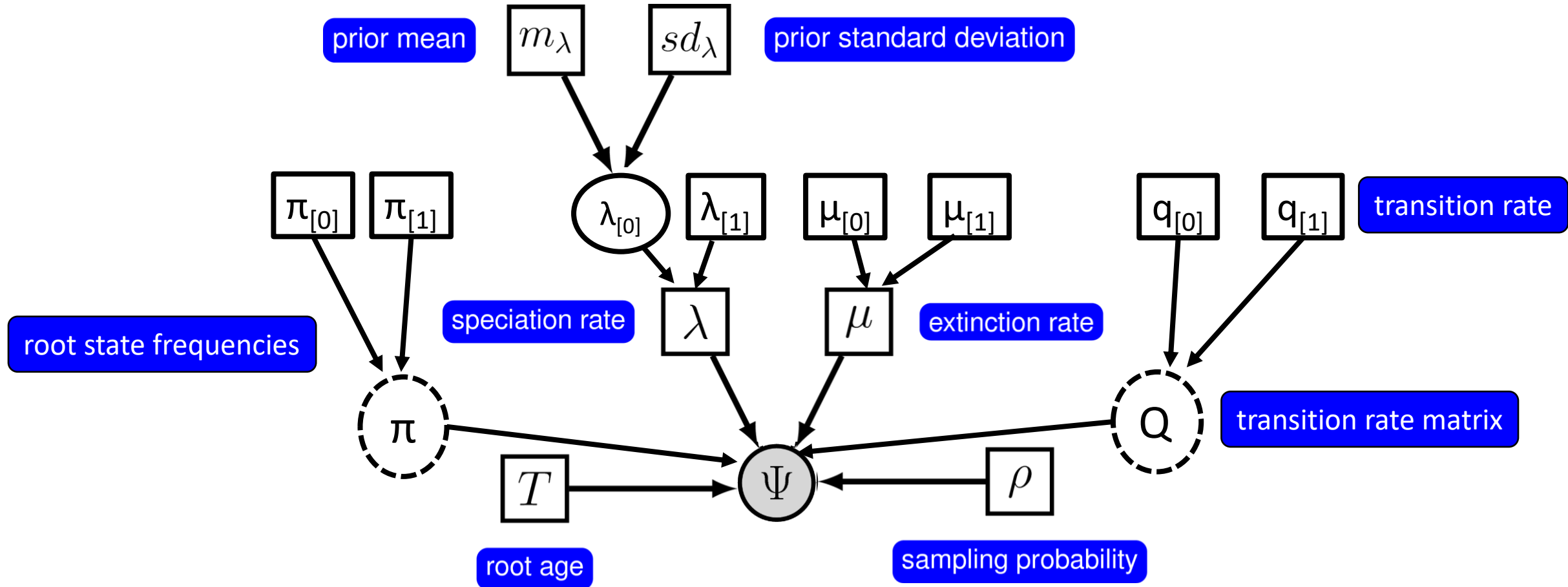
BD to BiSSE – transition rate matrix



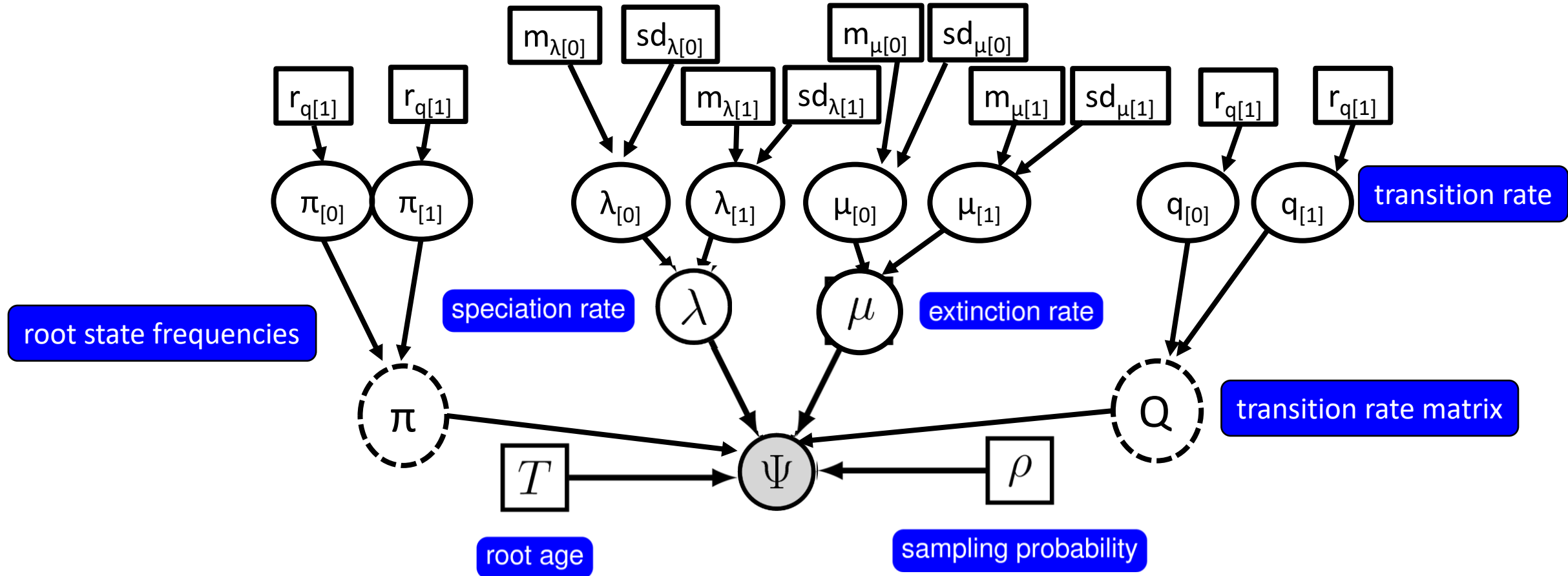
BD to BiSSE – root states



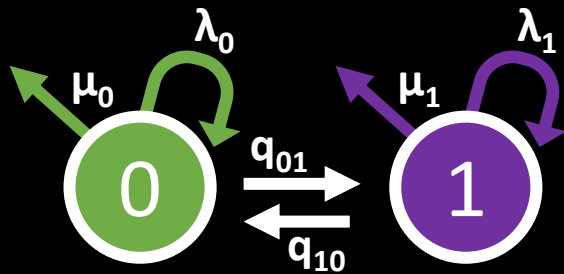
BD to BiSSE - priors



BD to BiSSE - priors

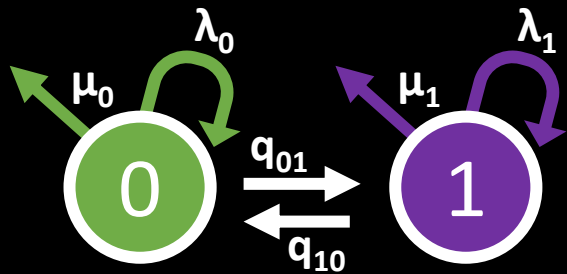


BiSSE to MuSSE

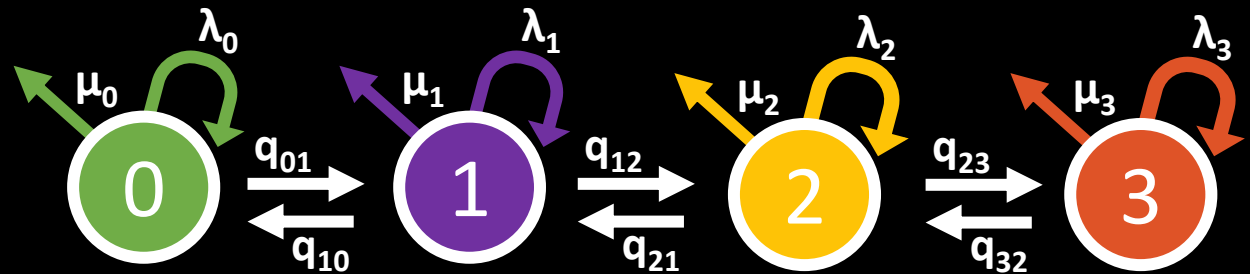


BiSSE

BiSSE to MuSSE

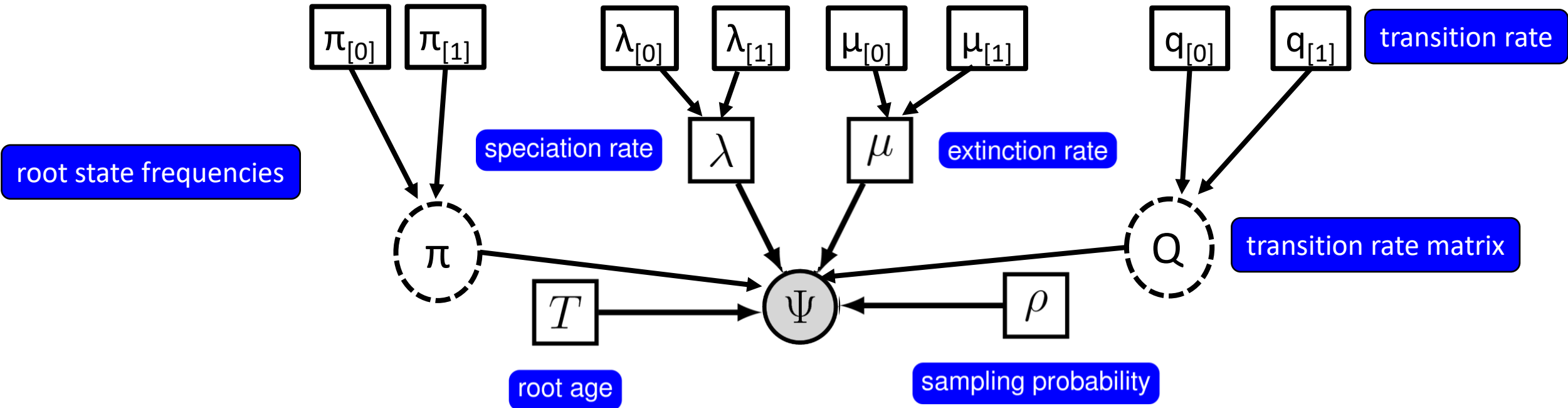


BiSSE

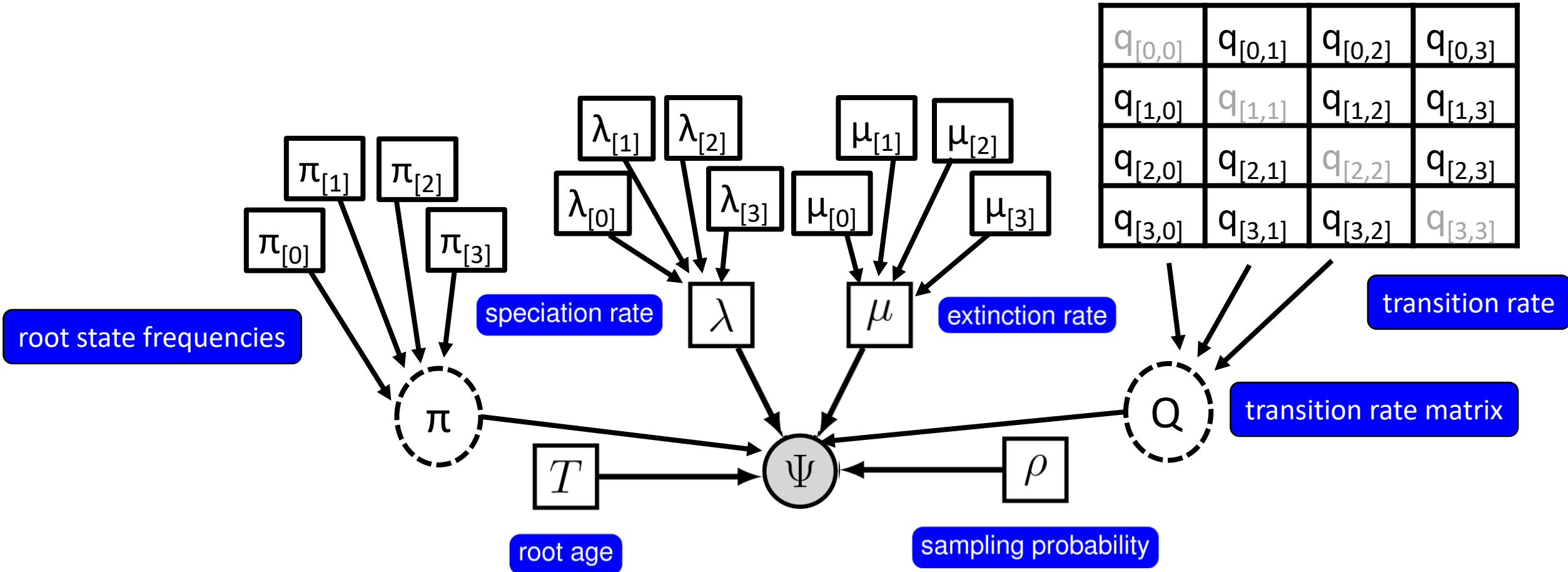


MuSSE

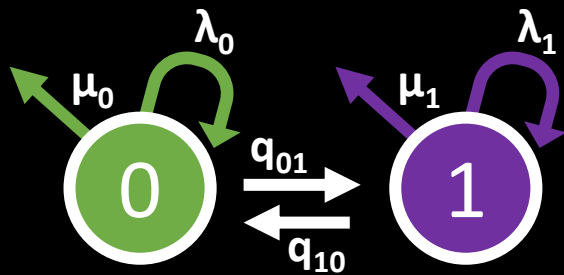
BiSSE to MuSSE



BiSSE to MuSSE

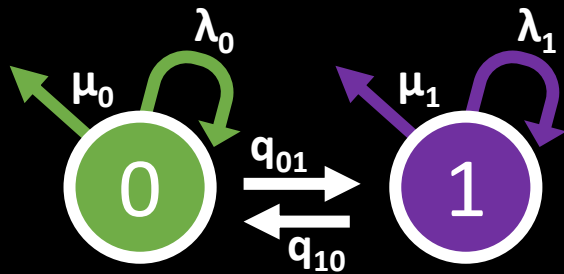


BiSSE to CID-2 (character independent div)

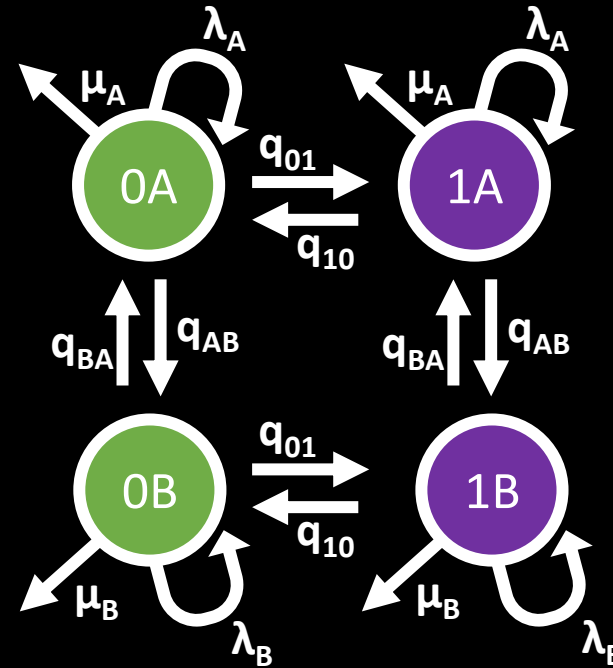


BiSSE

BiSSE to CID-2

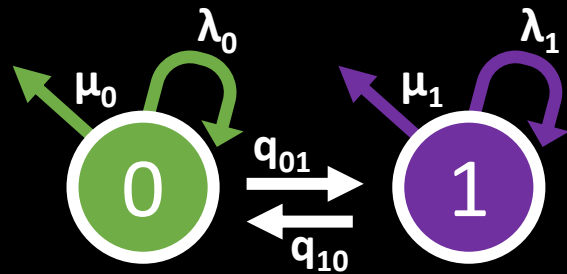


BiSSE

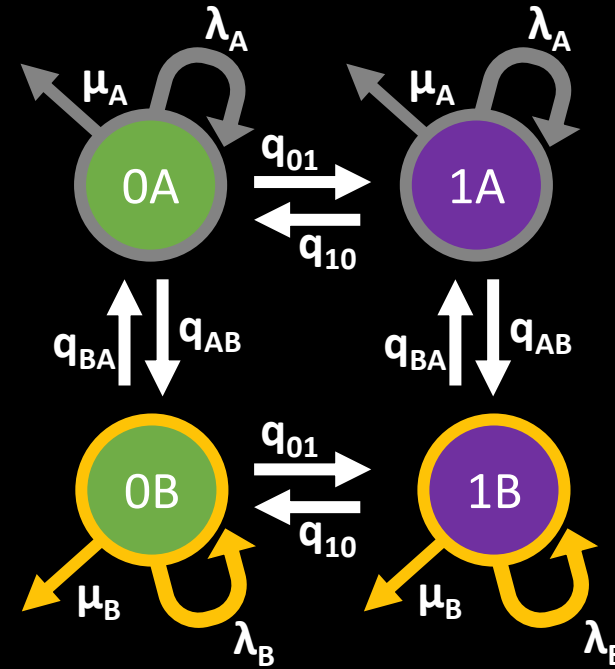


CID-2

BiSSE to CID-2

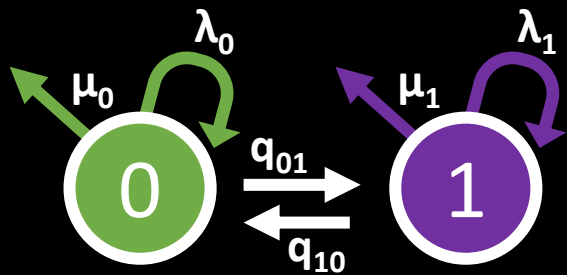


BiSSE

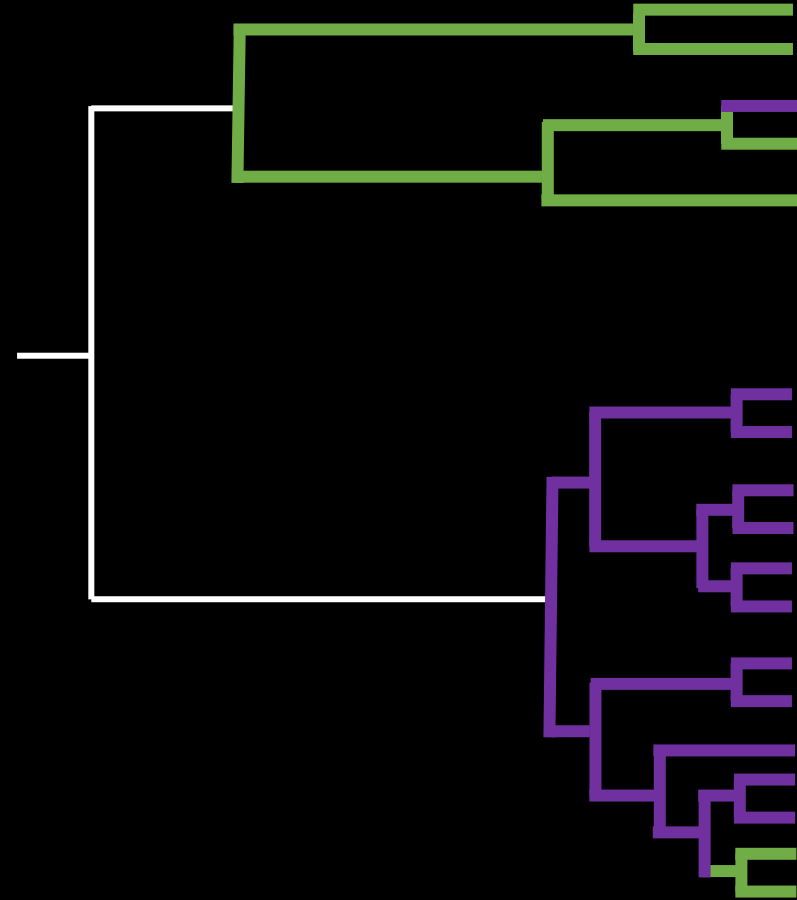


CID-2

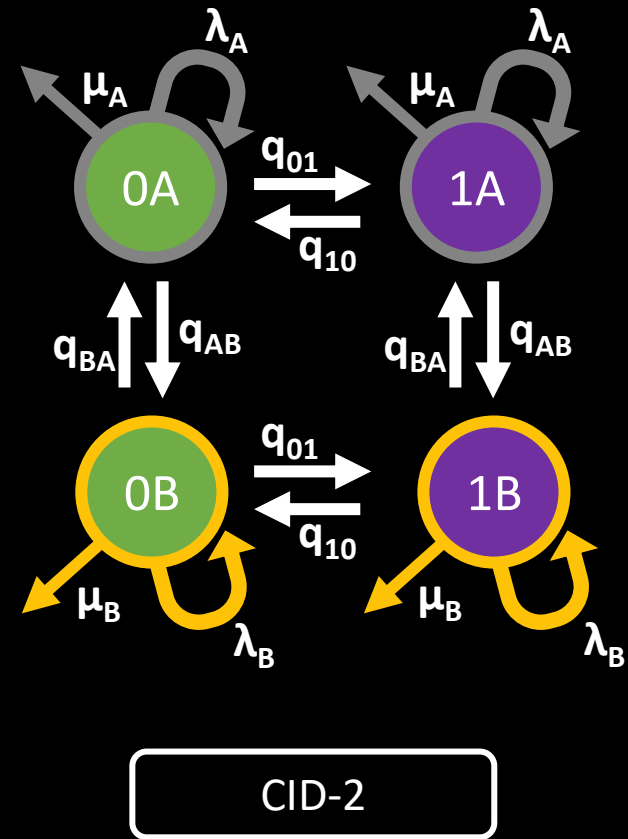
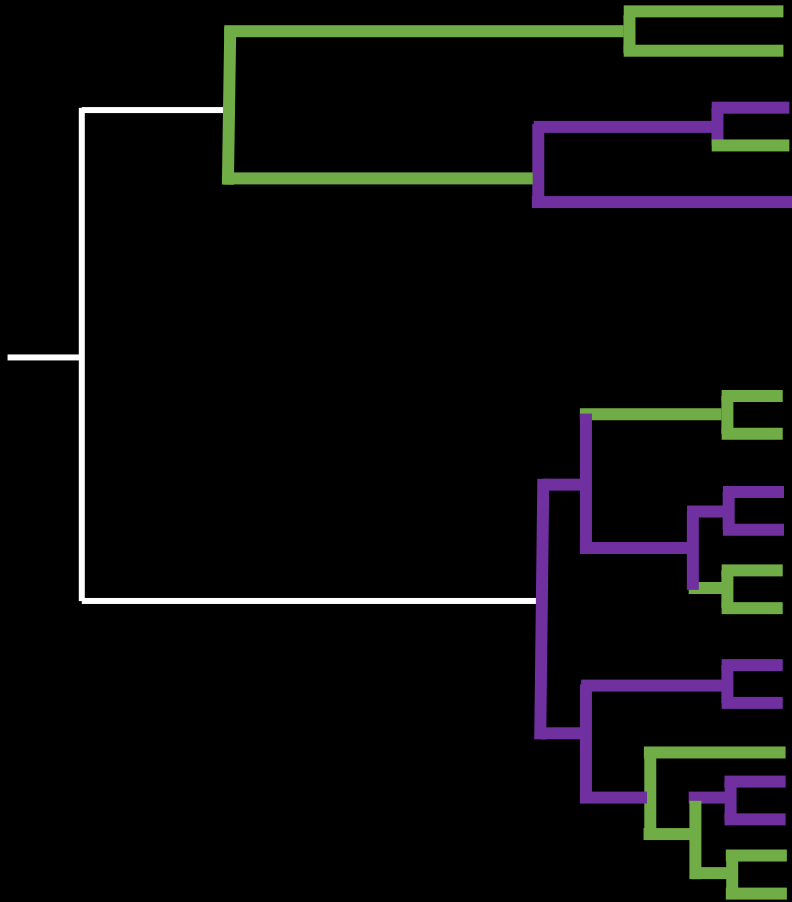
BiSSE to CID-2



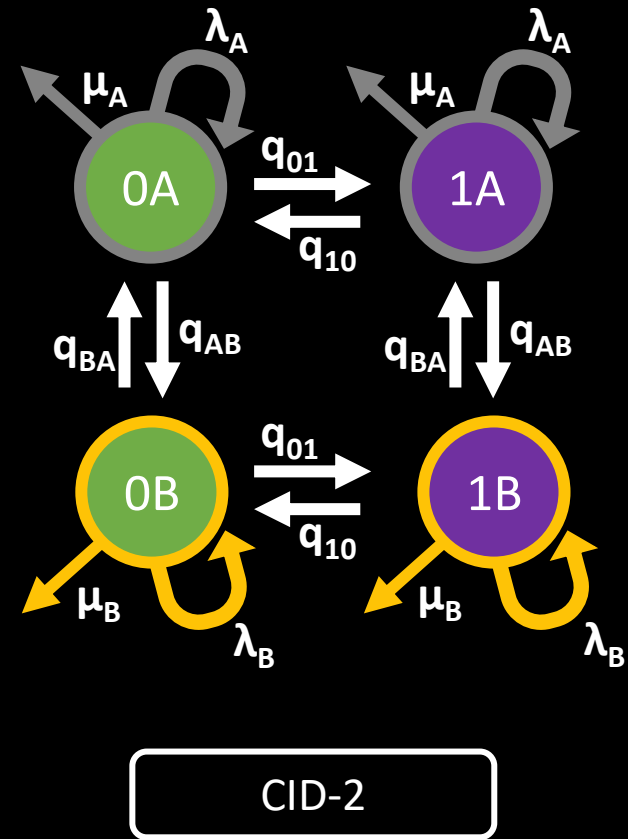
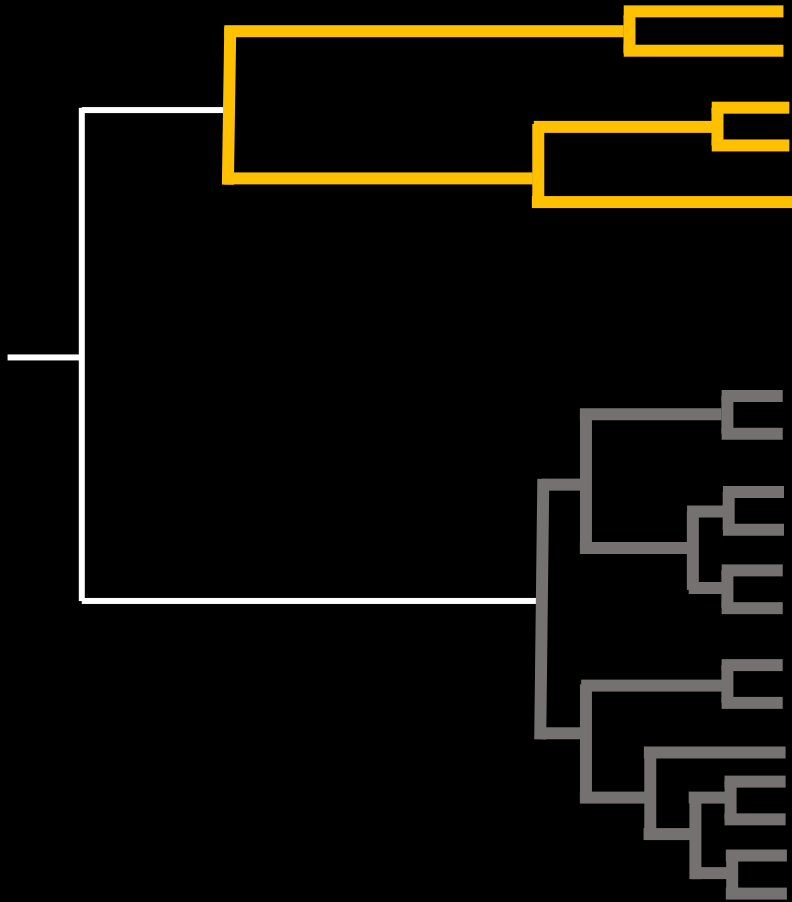
BiSSE



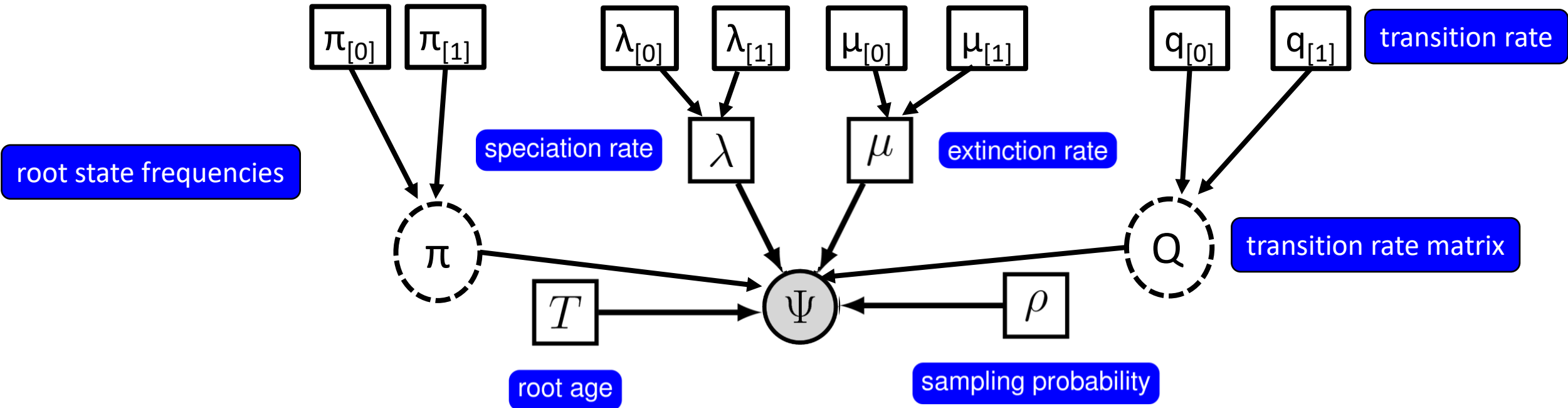
BiSSE to CID-2



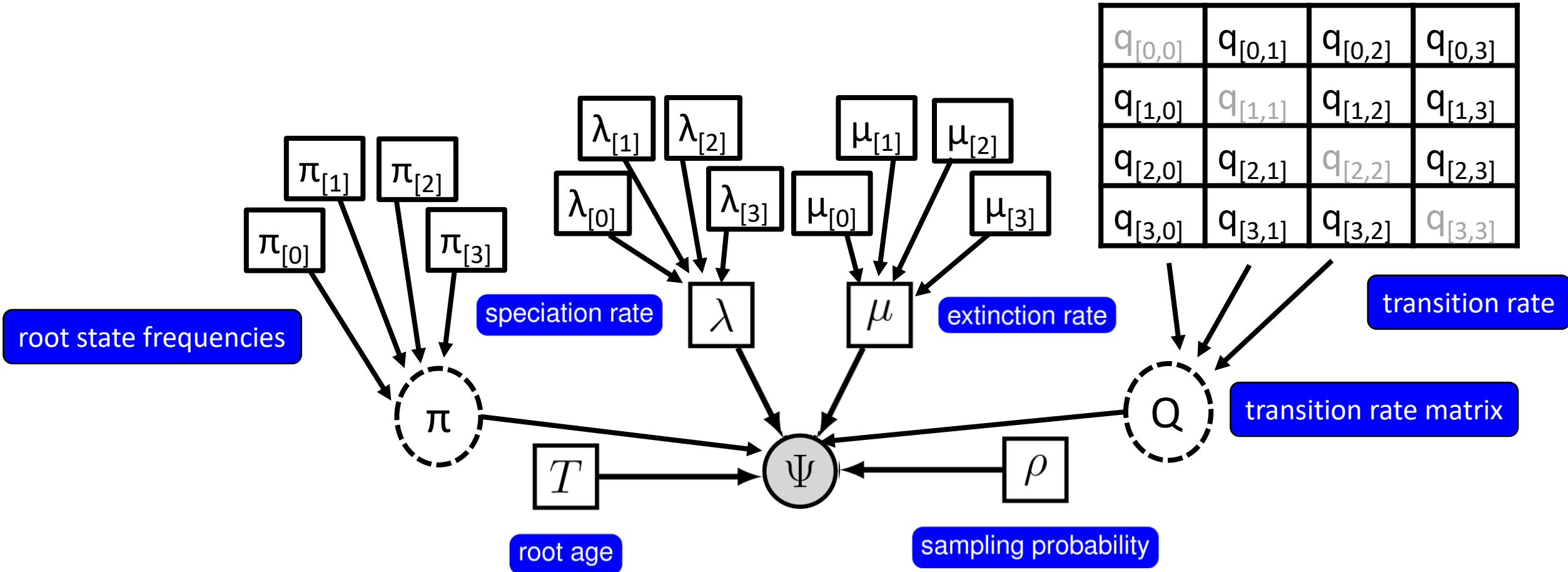
BiSSE to CID-2



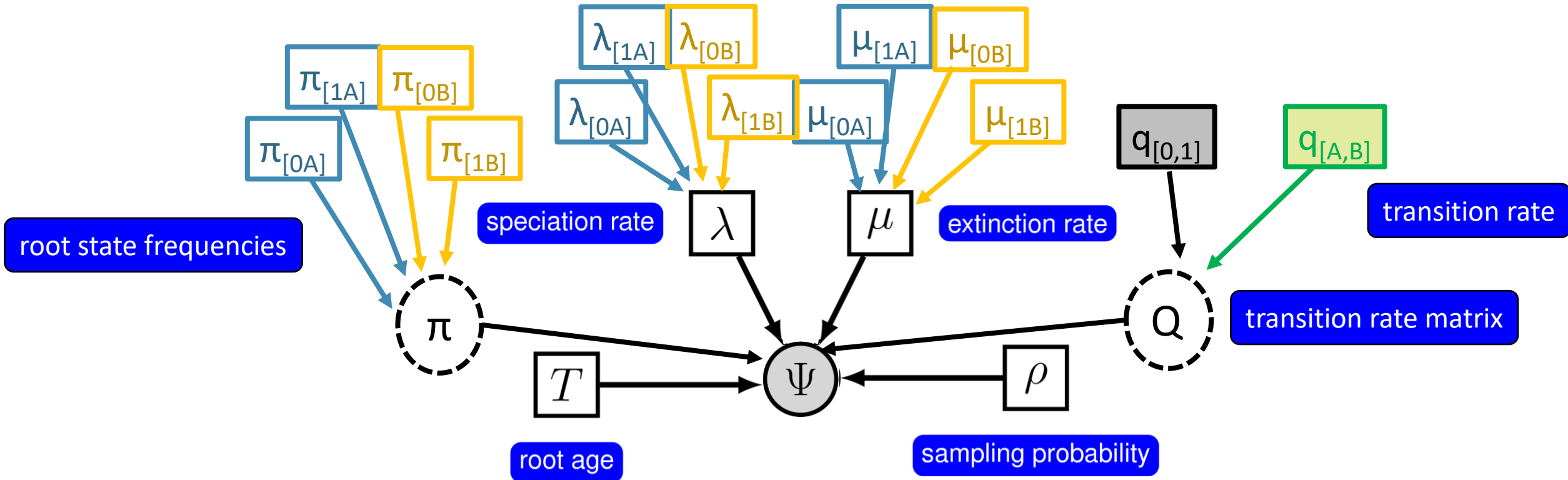
BiSSE to MuSSE



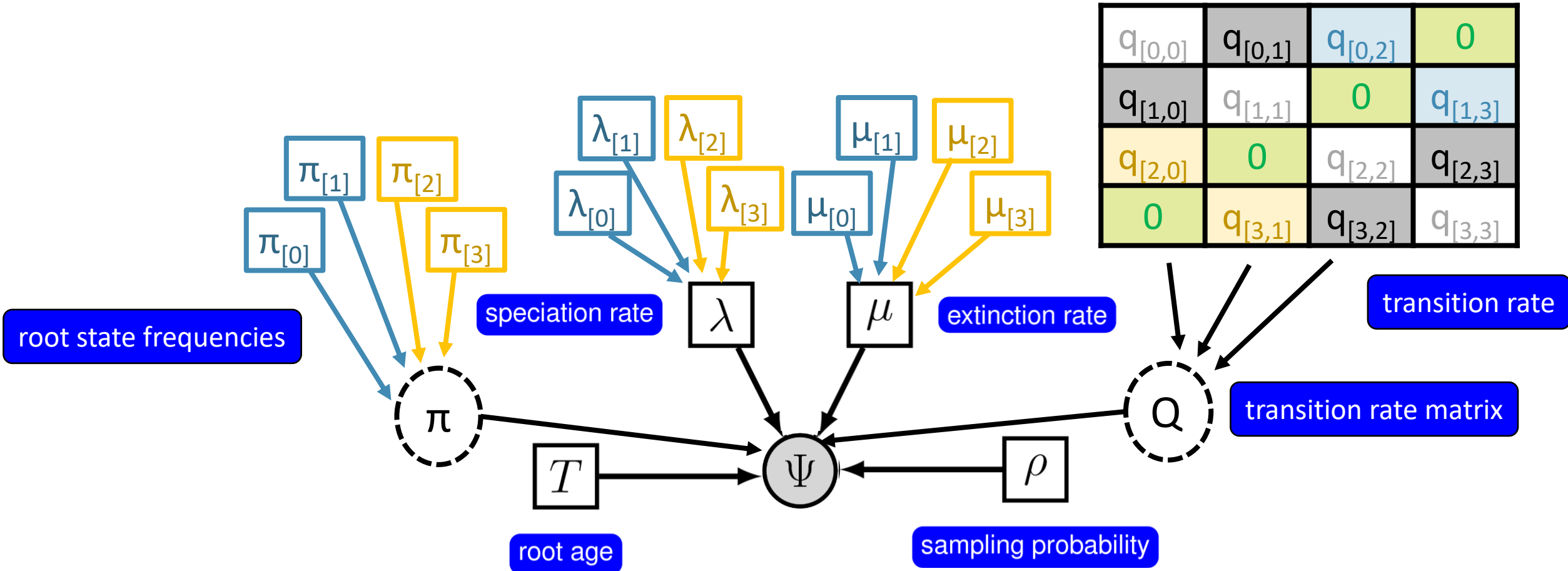
BiSSE to MuSSE



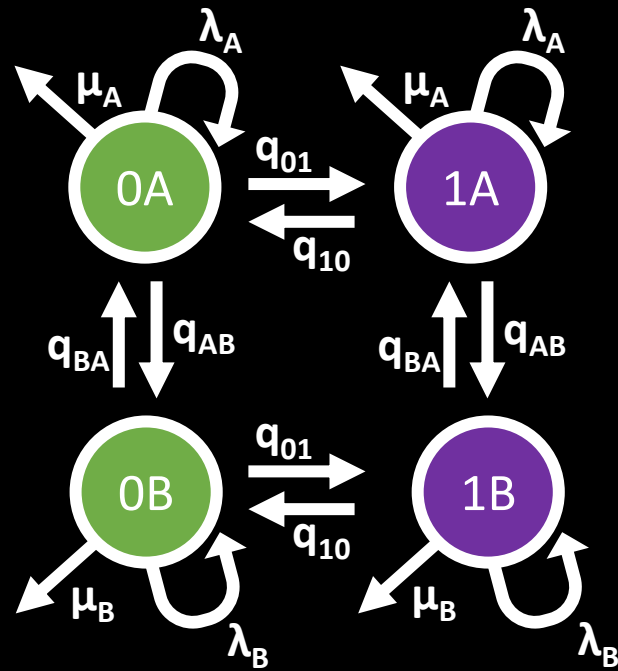
Hidden States – BiSSE/MuSSE to CID-2



Hidden States – BiSSE/MuSSE to CID-2

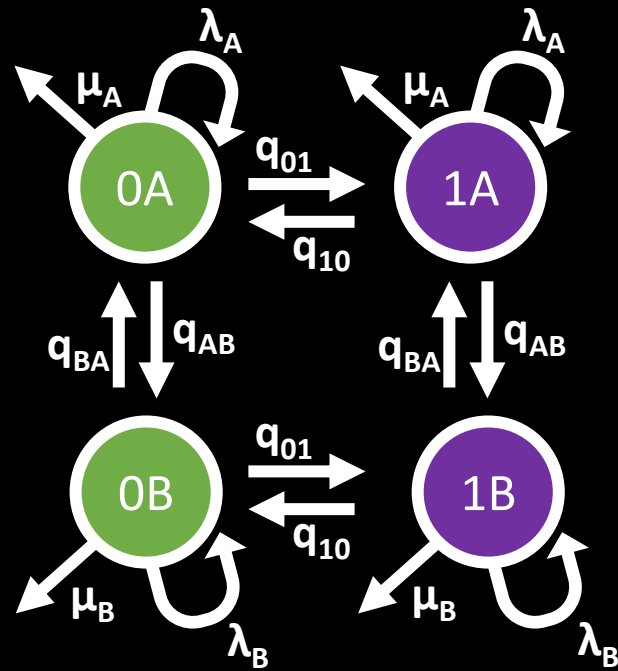


CID-2 to HiSSE



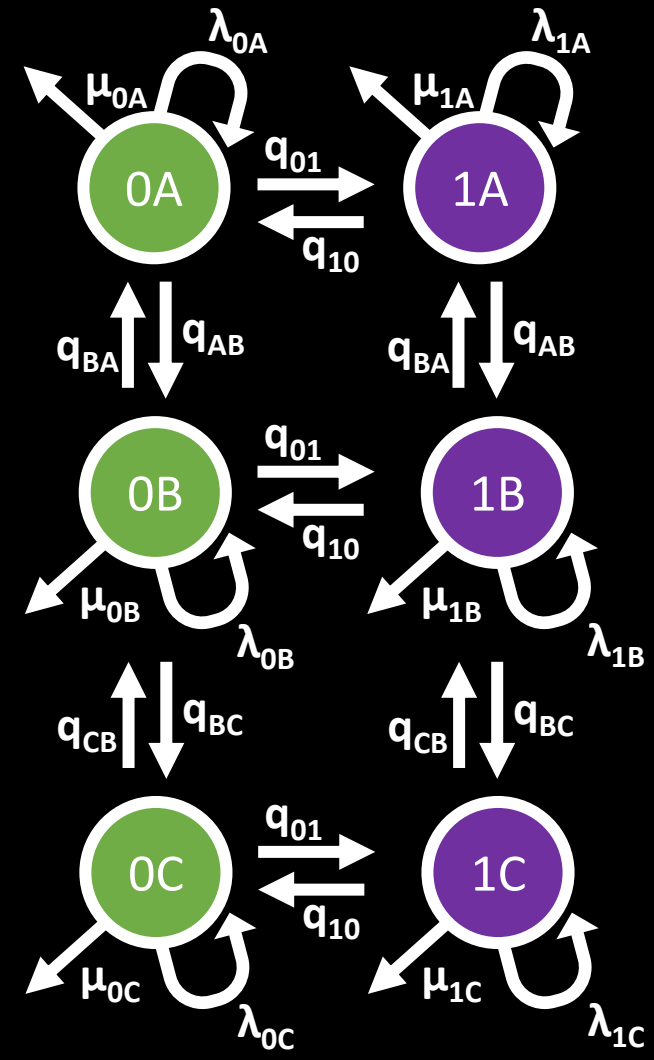
CID-2

CID-2 to HiSSE

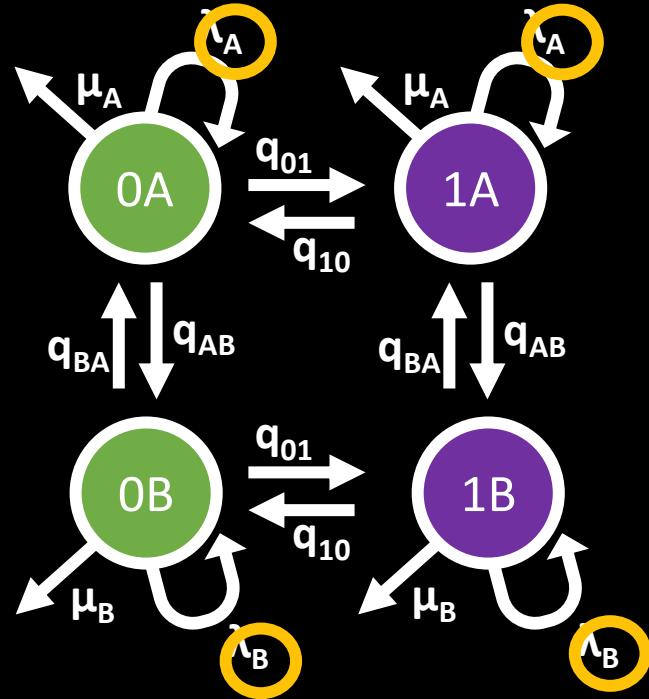


CID-2

HiSSE (3)

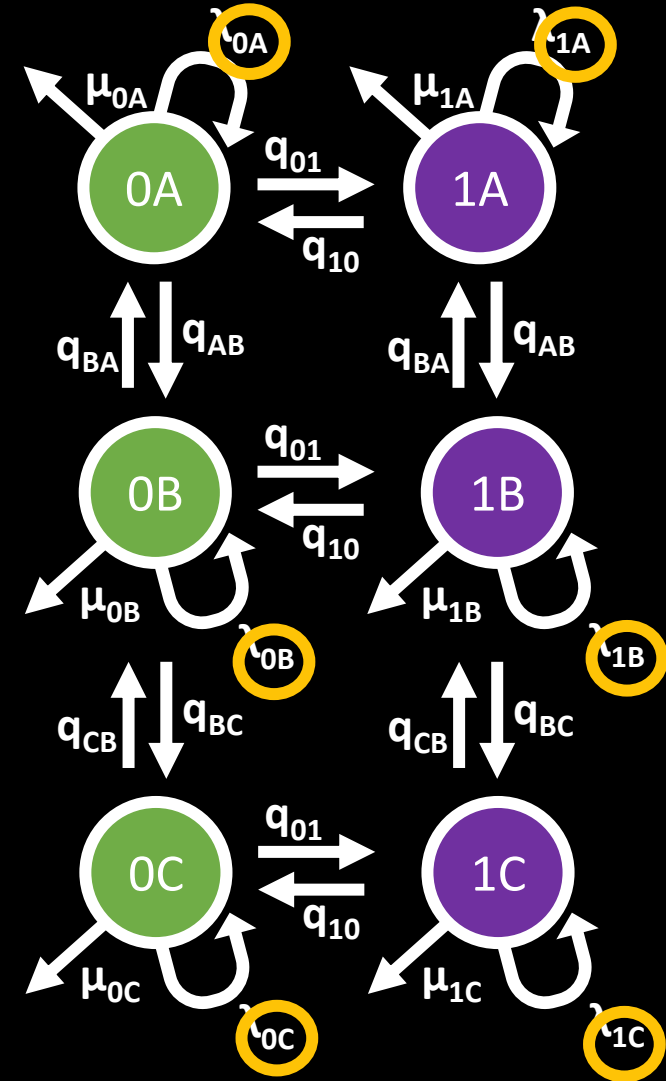


CID-2 to HiSSE

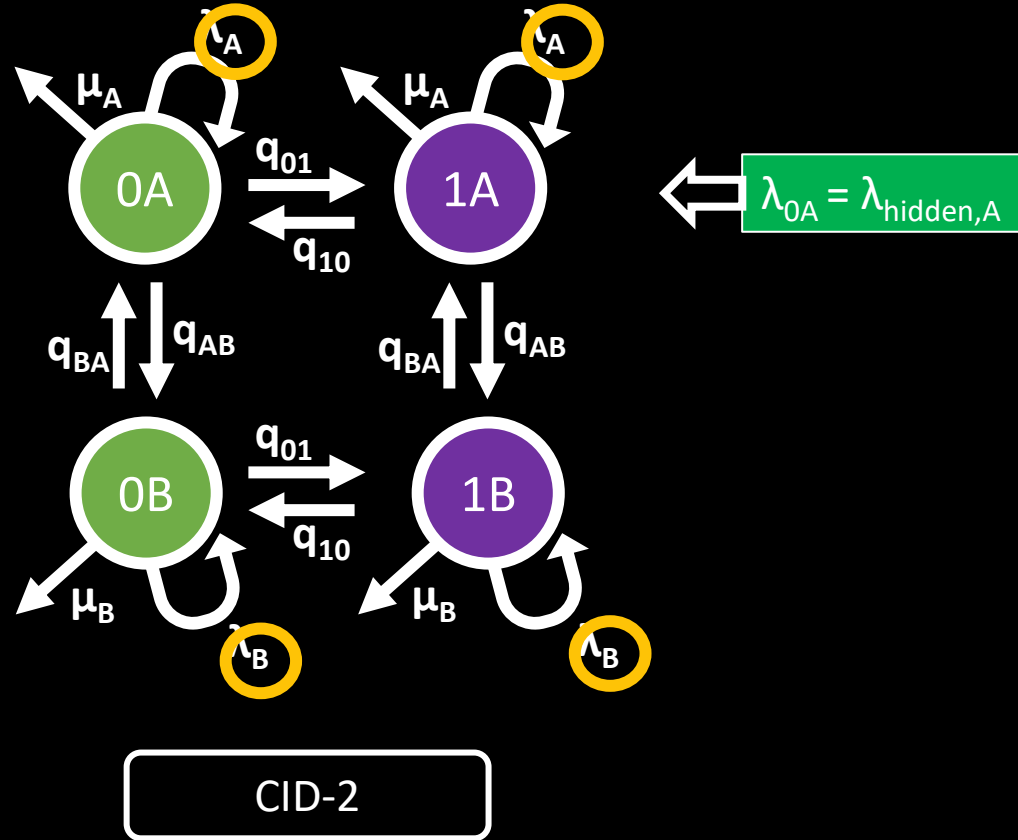


CID-2

HiSSE (3)

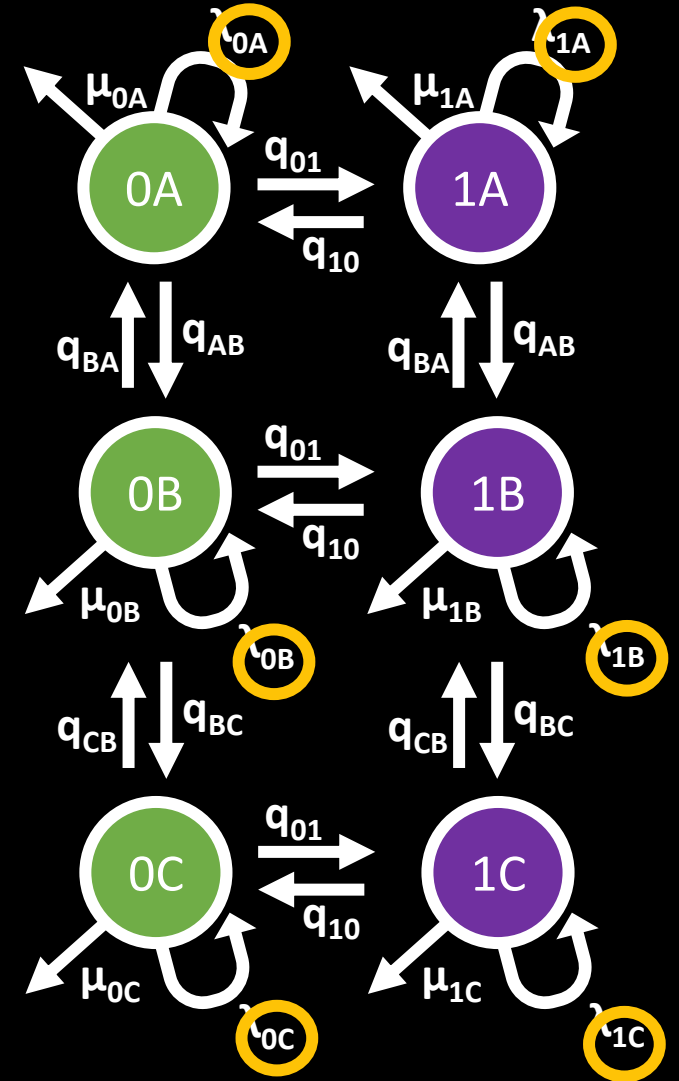


CID-2 to HiSSE

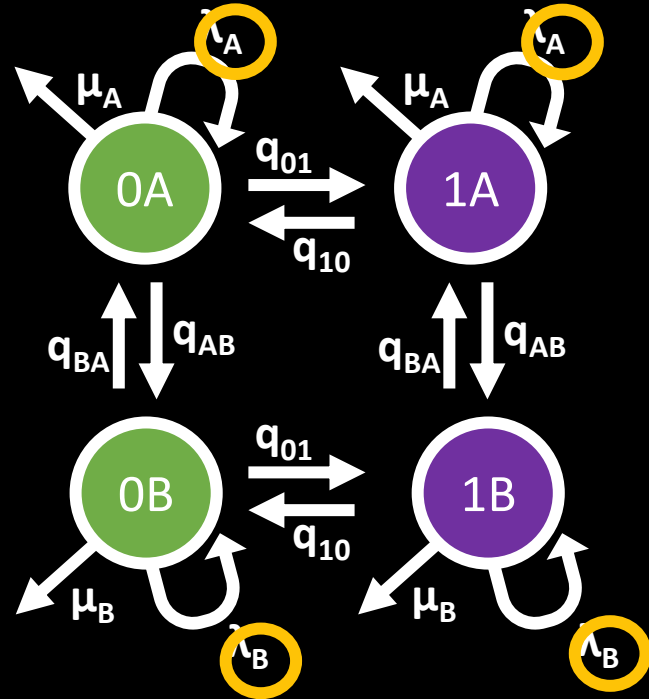


CID-2

HiSSE (3)



CID-2 to HiSSE

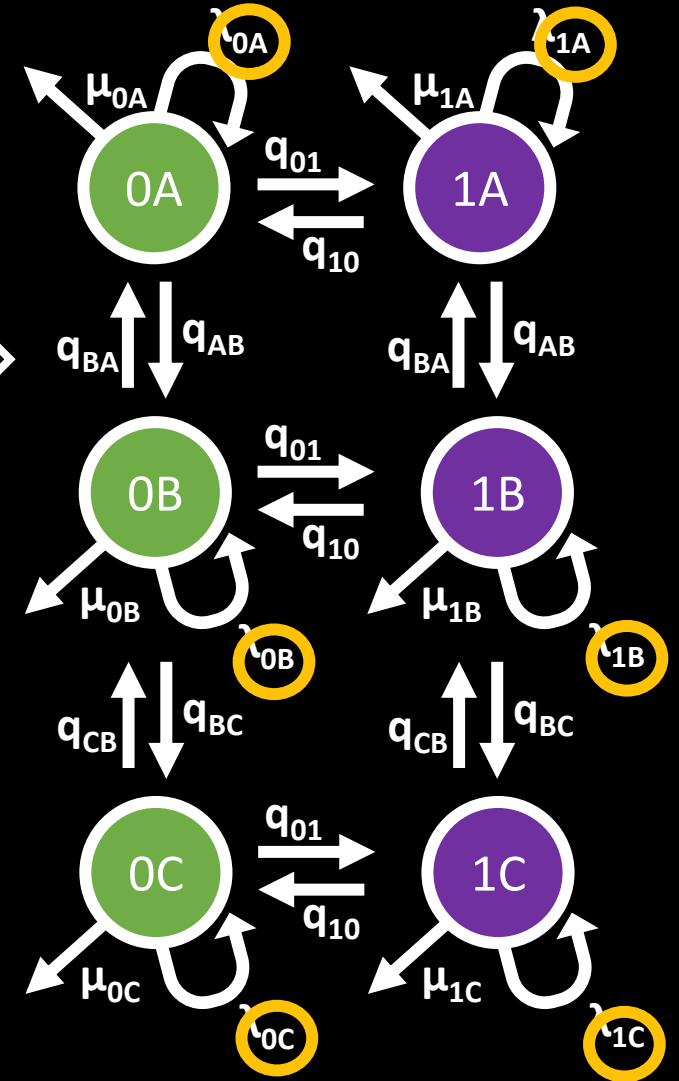


CID-2

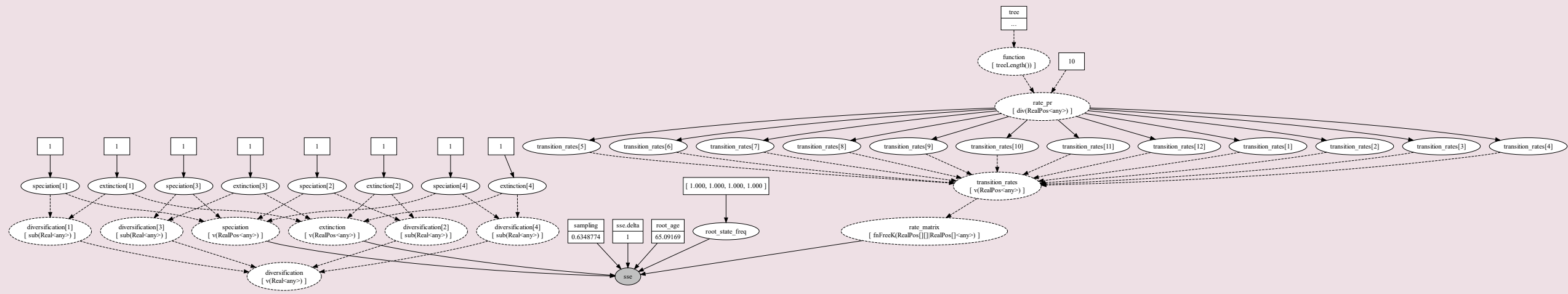
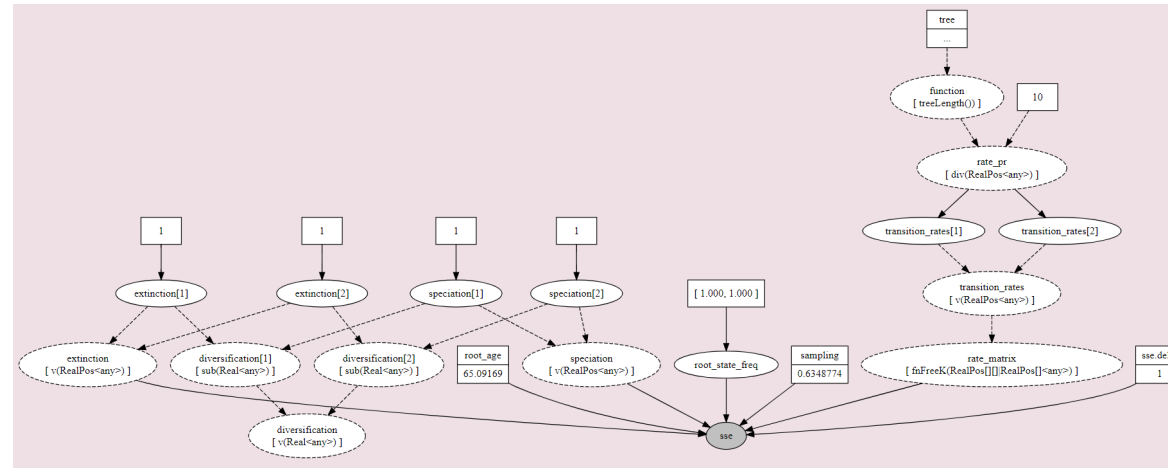
$$\lambda_{0A} = \lambda_{\text{hidden},A}$$

$$\lambda_{0A} = \lambda_{\text{observed},0} * \lambda_{\text{hidden},A}$$

HiSSE (3)



Multiple State Speciation & Extinction



Hidden State Speciation & Extinction

