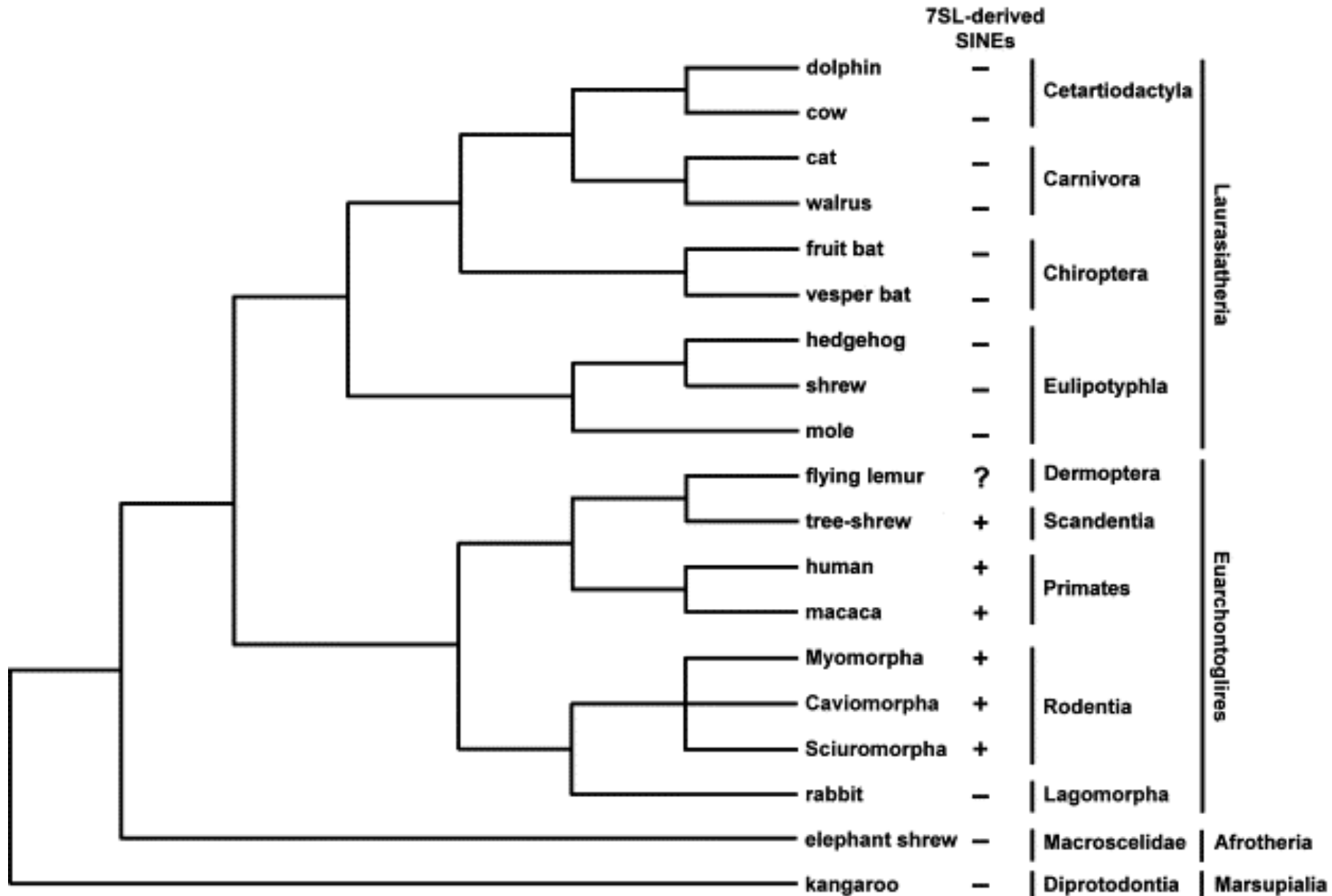


# Retrotransposon Phylogenetics

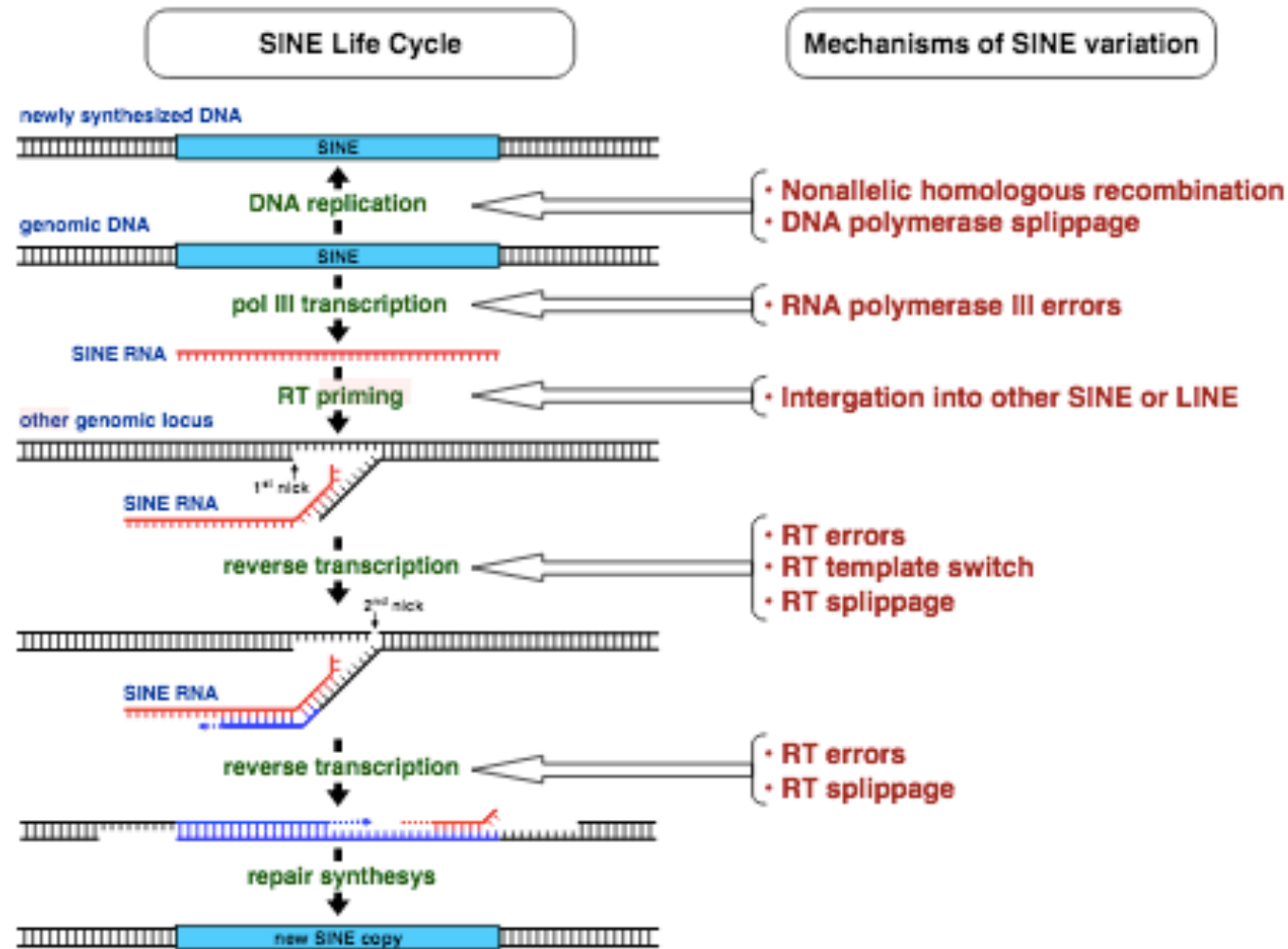
Surbhi Jain



# What makes retrotransposons so interesting?

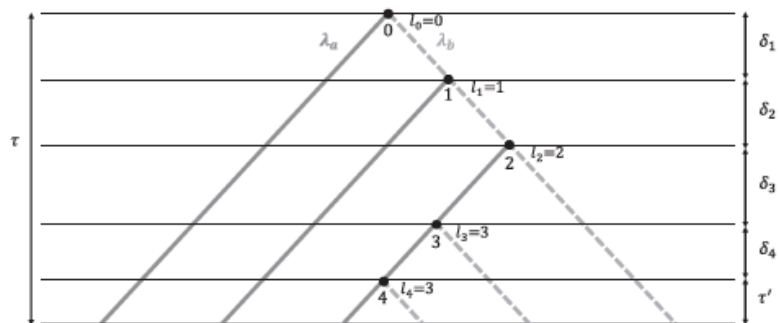
- No biological basis
- “Nothing in biology makes sense except in the light of evolution.” ([Dobzhansky, 1973](#))
- What is the biological basis of retrotransposons? Maybe the answer lies in evolution i.e. phylogenetics

# Rodent phylogeny: SINE B2 elements



# Aims

- Aim 1: Using 'Dual-birth model' to identify proportion of active SINE B2 elements
- Aim 2: Determine  $\lambda_a$ ,  $\lambda_b$  (birth parameters)
- Aim 3: Using Bayesian inference, determine tree distribution for mouse-related clade



# Methods

- Step 1: Building the dataset:
  - SINE B2 profile hidden Markov models (profile HMMs) from Dfam database
  - nhmmer to scan the reference genome
- Step 2: Multiple sequence alignment by PASTA
  - Tree inference by RAxML
- Step 3: Parameter estimation by Dual-birth model
  - $\lambda_a, \lambda_b$
  - r value