Model Selection for Cell Signaling Pathways

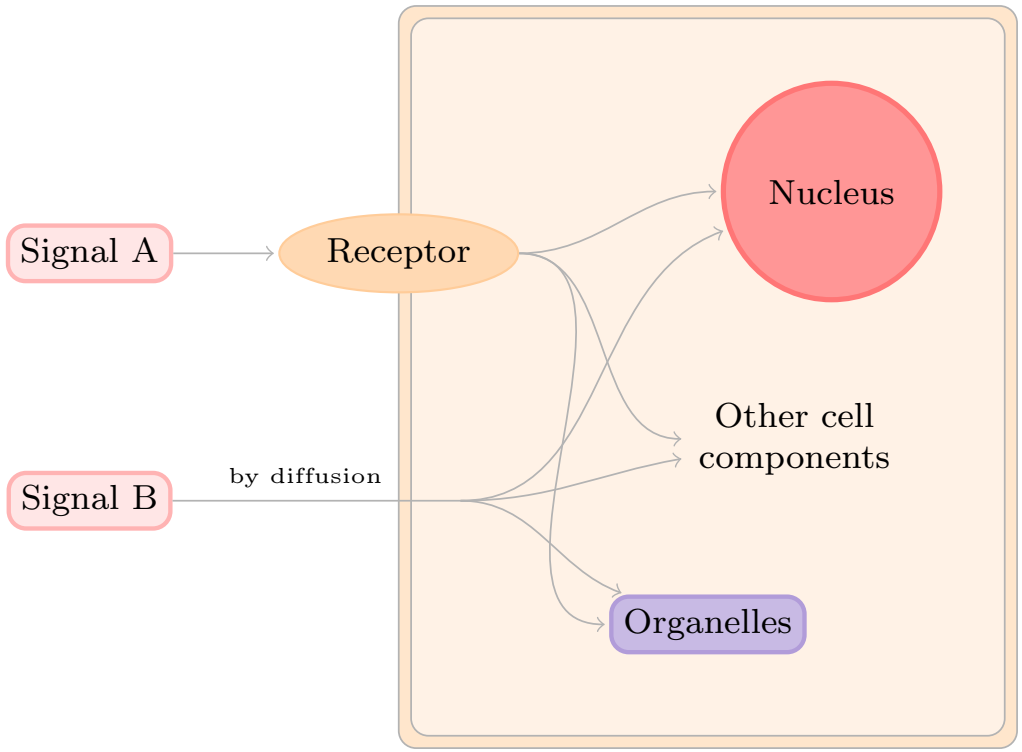
Student: Gustavo Estrela
Supervisor: Marcelo S. Reis

Institute of Mathematics and Statistics - University of São Paulo (IME-USP).
Special Laboratory of Cell Cycle, Butantan Institute.
During the development of this work, the author received financial support from São Paulo Research Foundation (FAPESP).

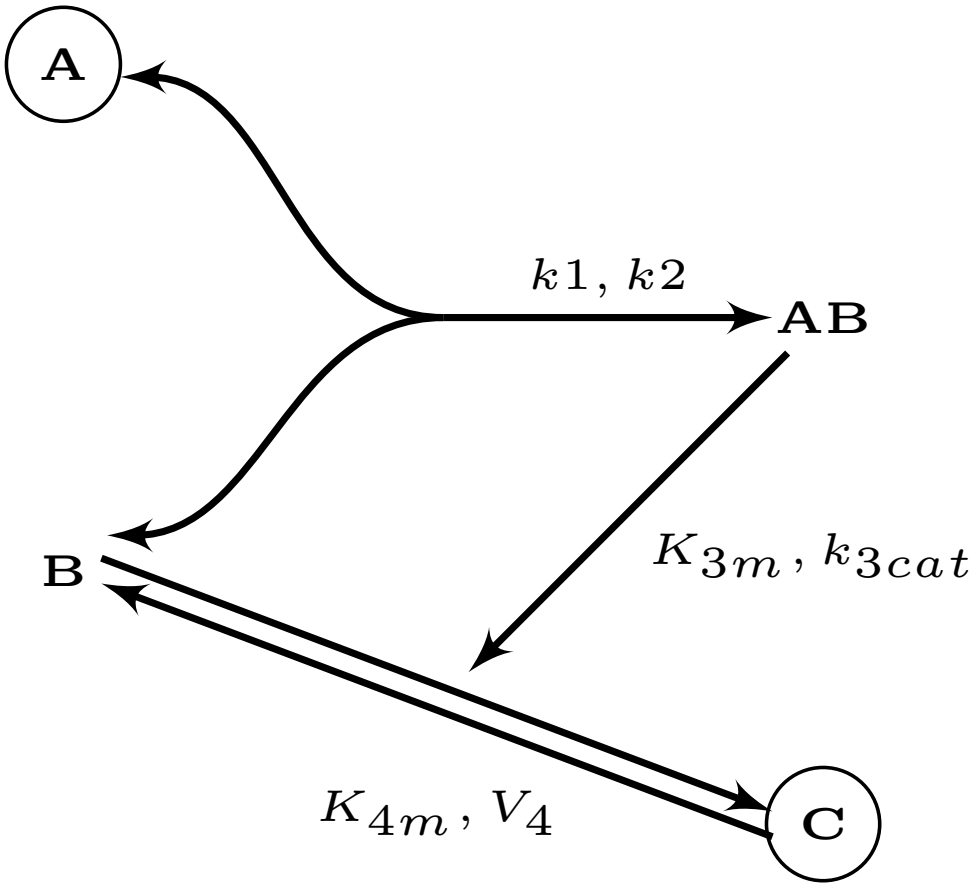
SPSAS - 2019

Contact: Gustavo Estela (gestrela@ime.usp.br)

Cell Signaling



Cell Signaling Pathways



These structures models change of concentrations of proteins.

Ranking Models

- Define a likelihood function $p(\mathbf{D}|M, \theta)$.

Contact: Gustavo Estela (gestrela@ime.usp.br)

Ranking Models

- Define a likelihood function $p(\mathbf{D}|M, \theta)$.
- Marginalize it to obtain $p(\mathbf{D}|M)$.

$$p(\mathbf{D}|M) = \int_{\Theta} p(\mathbf{D}|M, \theta) p(\theta|M) d\theta,$$

Contact: Gustavo Estela (gestrela@ime.usp.br)

Proposing Models

- Gather possible interactions from databases such as KEGG and STRING;

Contact: Gustavo Estela (gestrela@ime.usp.br)

Proposing Models

- Gather possible interactions from databases such as KEGG and STRING;
- Systematically remove/add these chemical reactions to a model to create new models.