

Cancer progression models (CPMs)

Identify restrictions in the order of accumulation of mutations (events) using cross-sectional data.

Restrictions: deterministic dependencies, inhibiting/facilitating stochastic dependencies.

Not restricted to cancer.

- Variety of models
- Limited, restricted, and questionable assumptions
- Difficult to modify, extend, compare
- Interpretation problems
- Uncertainty in derived predictions

Universal Probabilistic Programming Languages

Extend programming languages with `sample` and `observe` constructs: *universal* PPLs.

Specify the *scientific model* as a program.

Separate the model from the inference algorithm:

- the user does not implement the inference algorithm
- the probabilistic programming language (almost) automatically performs inference

Example

