

SBI Toolbox: Idea: recap

Bayesian approach to parameter estimation

$$p(\theta|X = x) = \frac{p(x|\theta)p(\theta)}{p(x)}$$

→ Numerically expensive

SBI Toolbox: Idea: recap

“Likelihood-free” approach to parameter estimation

$$p(\theta|X = x) = \frac{p(x|\theta)p(\theta)}{p(x)}$$

Unknown

Numerically expensive

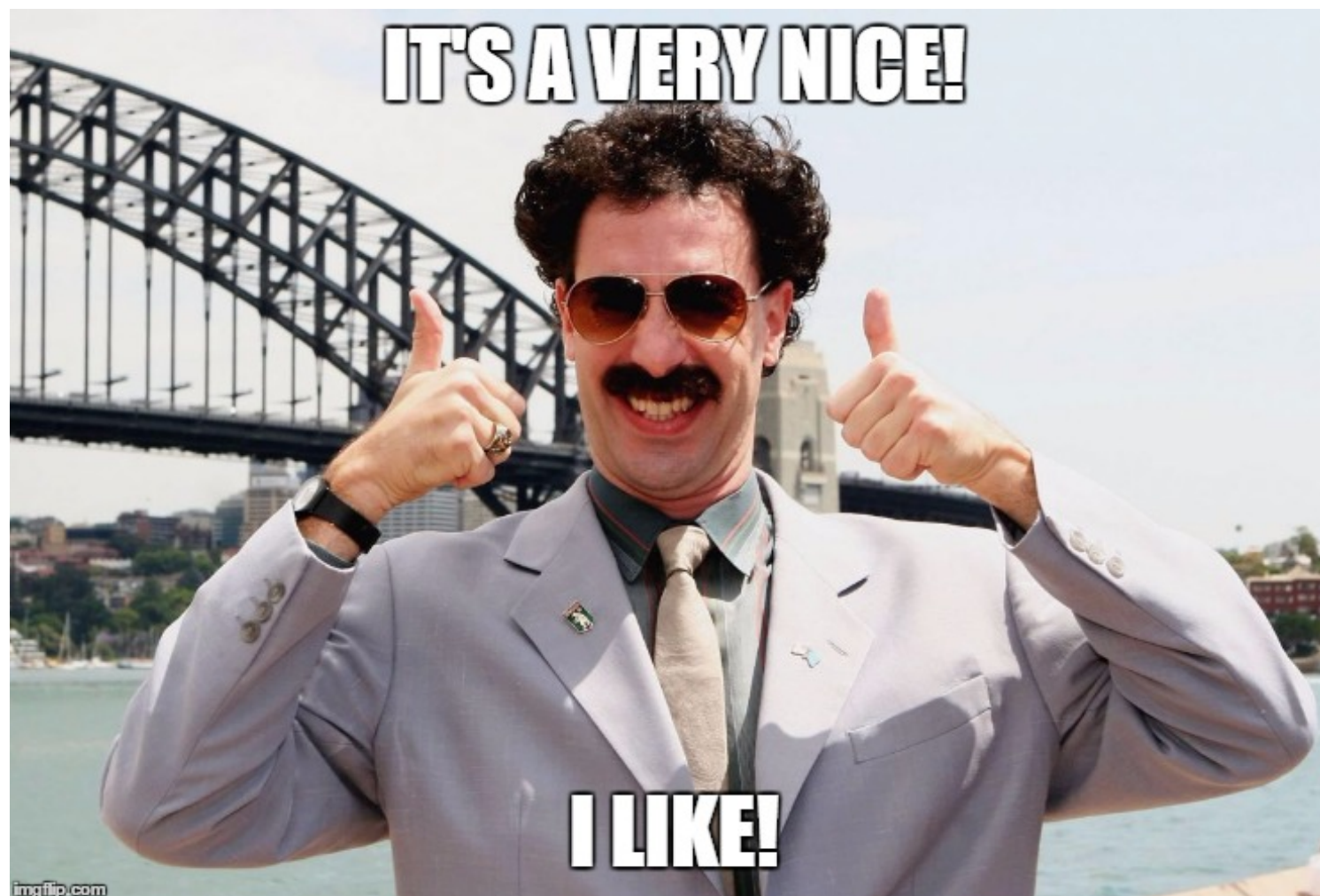
SBI Toolbox: Idea: recap

“Likelihood-free” approach to parameter estimation

$$p(\theta|X = x) = \frac{p(x|\theta)p(\theta)}{p(x)}$$

Unknown ←

→ Numerically expensive



SBI Toolbox: Idea: recap

“Simulation-based” approach to parameter estimation

(redefined)

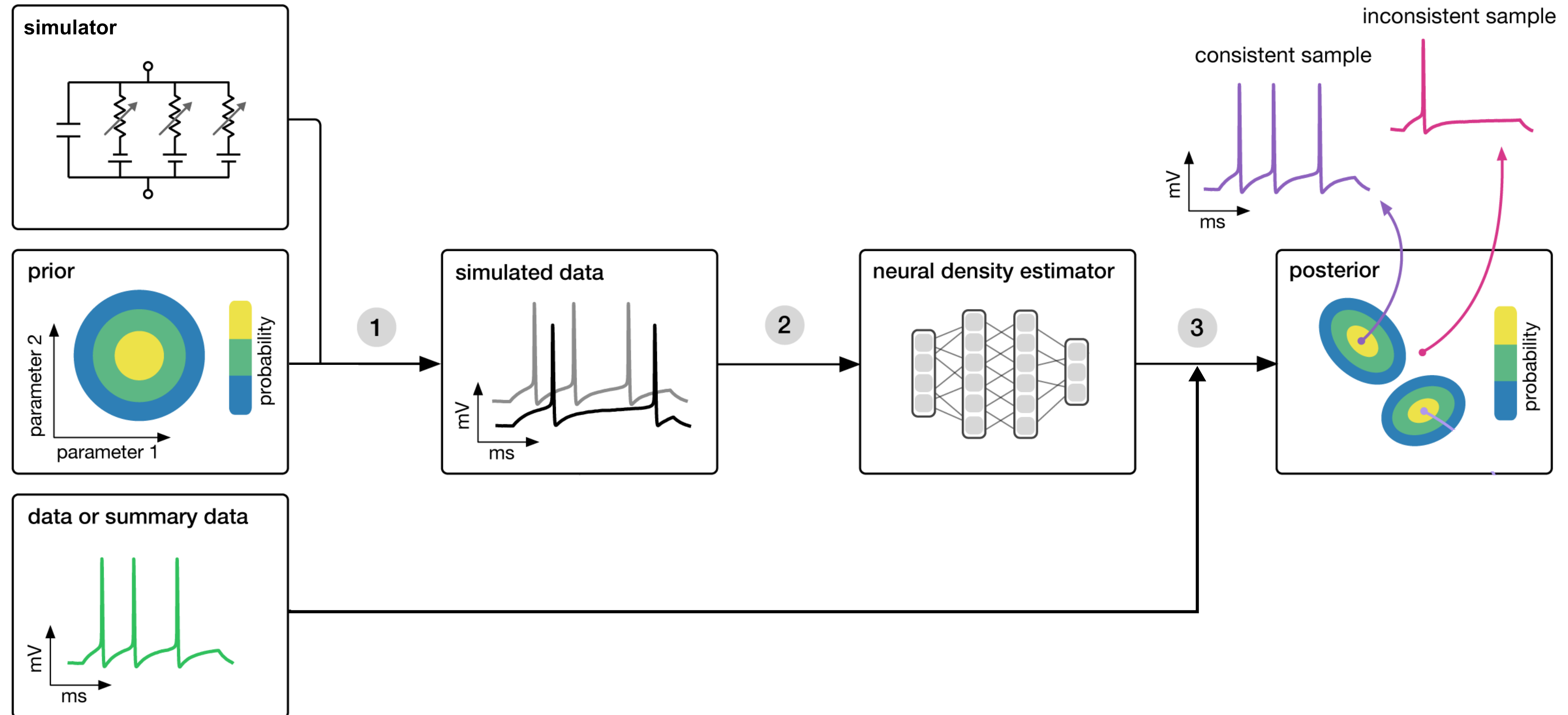
$$p(\theta | X = x) = \frac{p(x|\theta)p(\theta)}{p(x)}$$

Simulate ←

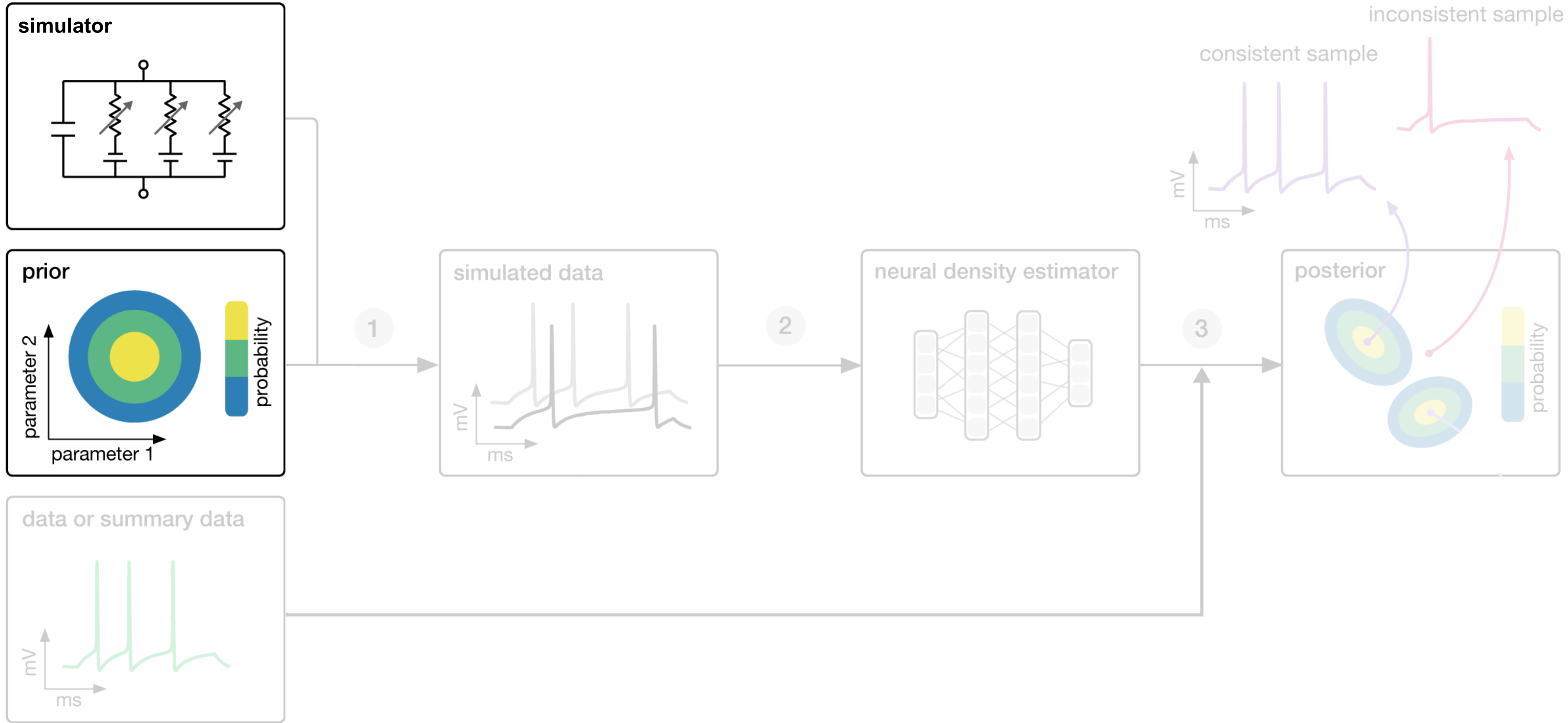
→ **Numerically expensive**

The diagram illustrates the components of the SBI equation. The term $p(x|\theta)$ in the numerator is enclosed in a red box, with a red arrow pointing from it to the word "Simulate". The term $p(x)$ in the denominator is enclosed in a pink box, with a pink arrow pointing from it to the phrase "Numerically expensive".

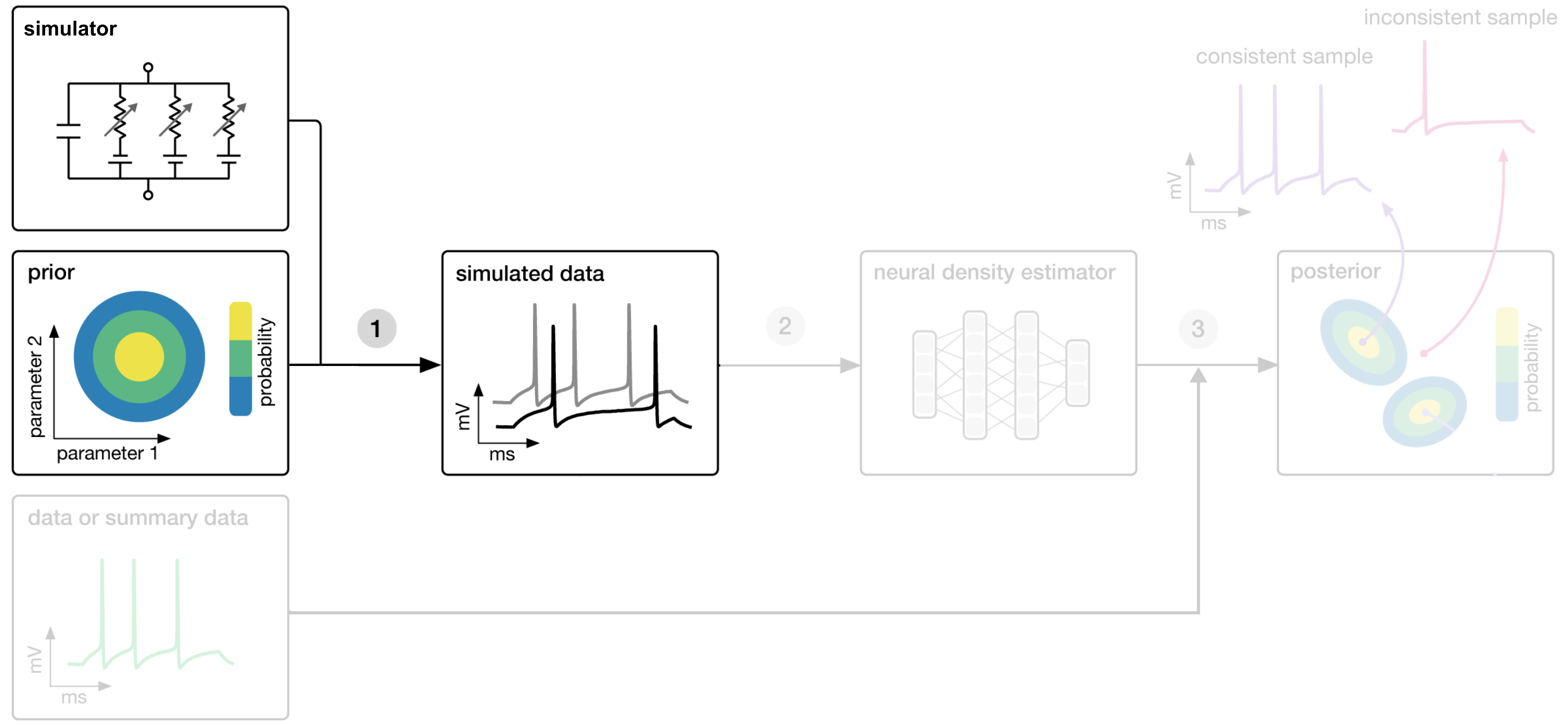
SBI Toolbox: overview



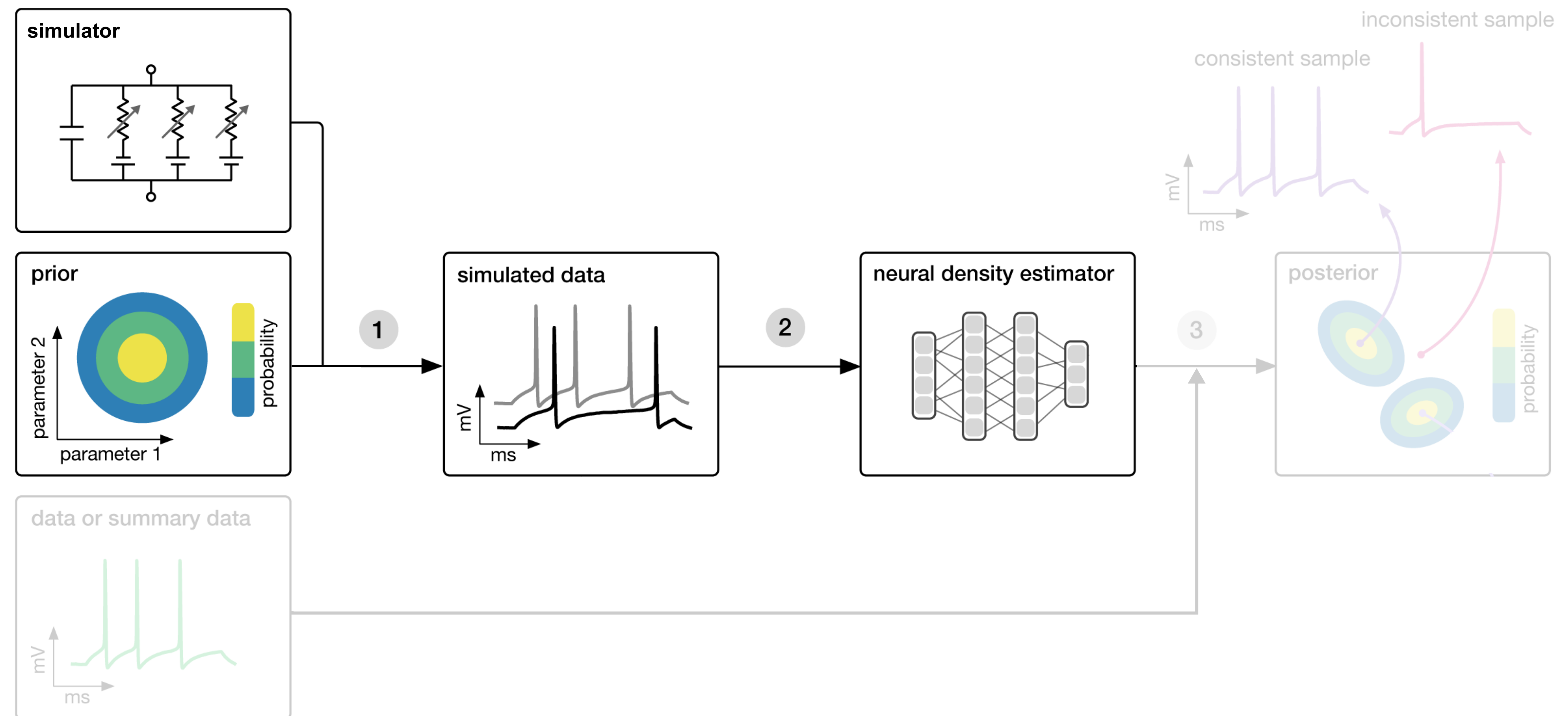
0. Basic ingredients 🍰



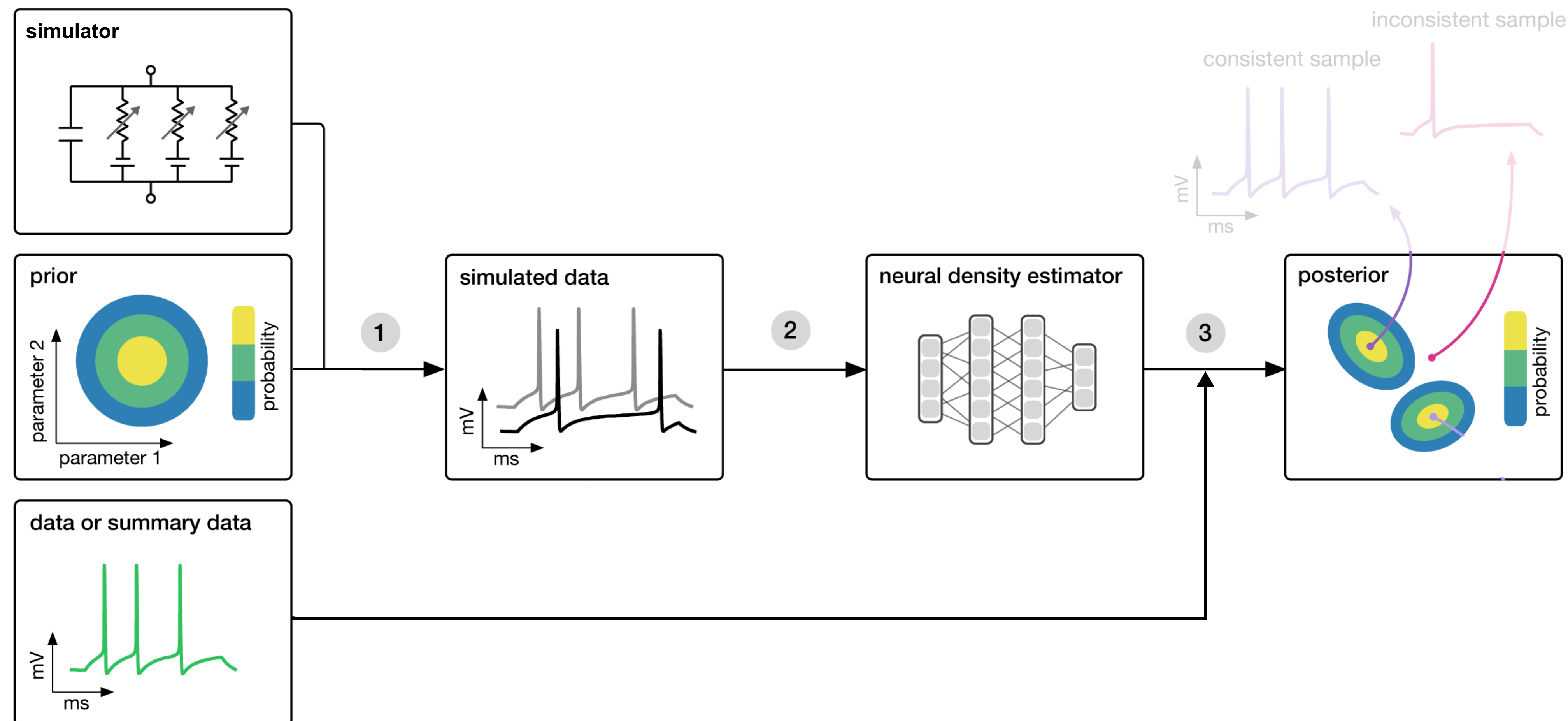
1. Simulate data



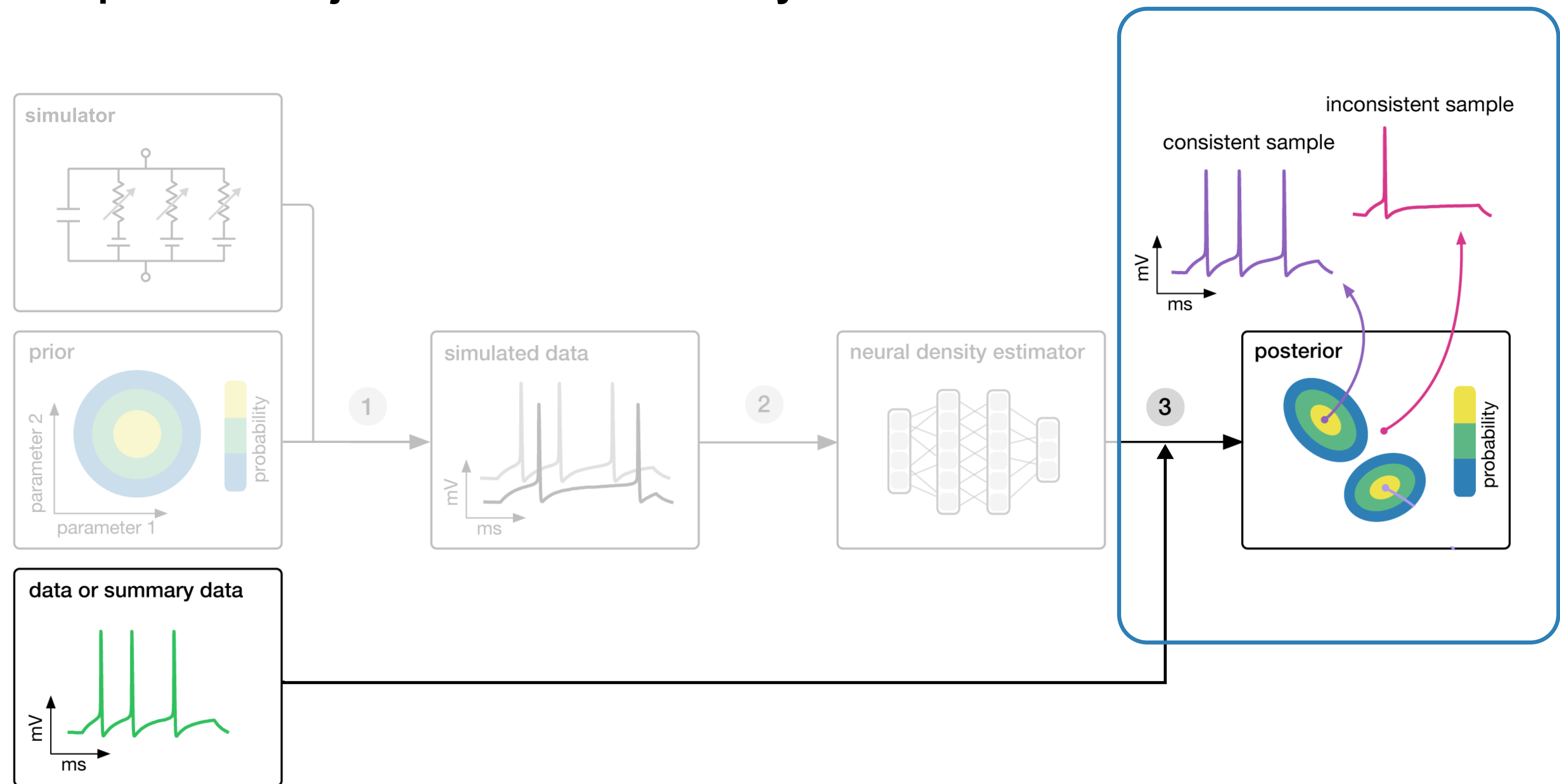
2. Pass the simulated data to the inference object



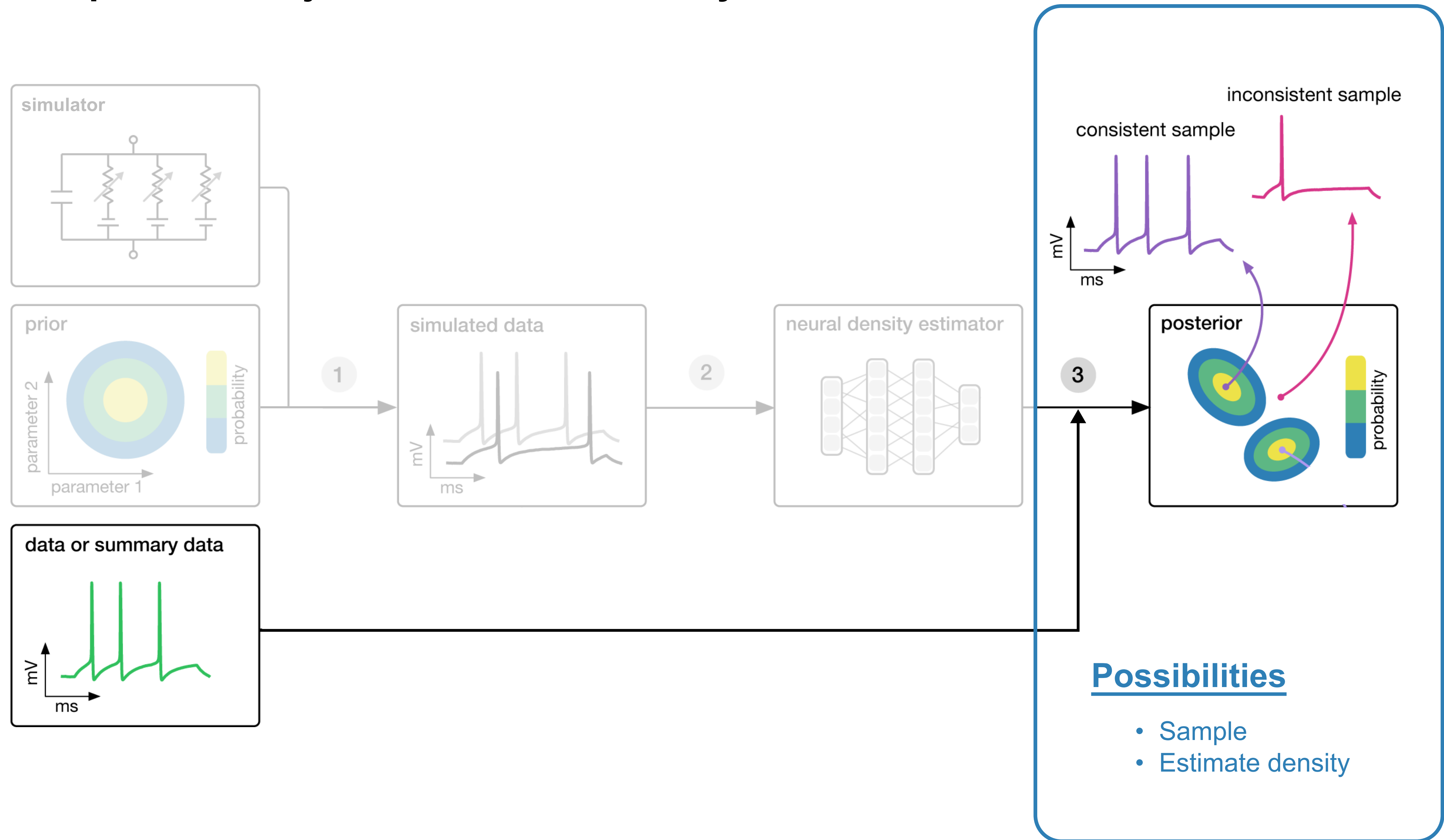
3. Build the posterior object from trained density



3. Build the posterior object from trained density



3. Build the posterior object from trained density



4. Multiround

