Typical experimental and model setup and workflow Generic model Generic Generic of biological system observation model noise model $y_1 = s \cdot x_1$ $y_2 = C + x_2$ Experiments Condition 1 Condition-specific model Condition-specific Condition-specific observation model noise model of biological system Condition 2 $y_1 = s_a \cdot x_1$ $\sigma_1 = 0.1 \cdot x_1$ $y_2 = c_a + x_2$ $\sigma_2 = 0.5$ $\sigma_1 = 1.0$ $y_1 = S_h \cdot X_1$ $\sigma_2 = 2.0$ $y_2 = C_h + X_2$ Measurements Simulate Likelihood, Residuals, ... Parameter estimation / Uncertainty analysis Visualize, Analyze, Optimize, Profile, Sample, ... Predict. ...

Representation of the workflow elements in PEtab

Condition table Observable table

conditionId| p1 p2 ... observableId|observableFormula noiseDistribution noiseParameters Condition1 | 1.0 1.0 Observable1 s·x1 normal 1.0 Condition2 5.0 4.0 Observable2 c + x2laplace 3.0



Measurement table observableId simulationConditionId time measurement Observable1 Condition1 1.0 2.0 Observable2 Condition2 1.0 3.0

Parameter table estimated nominalValue parameterId Parameter1 1 Parameter2 0 3.0