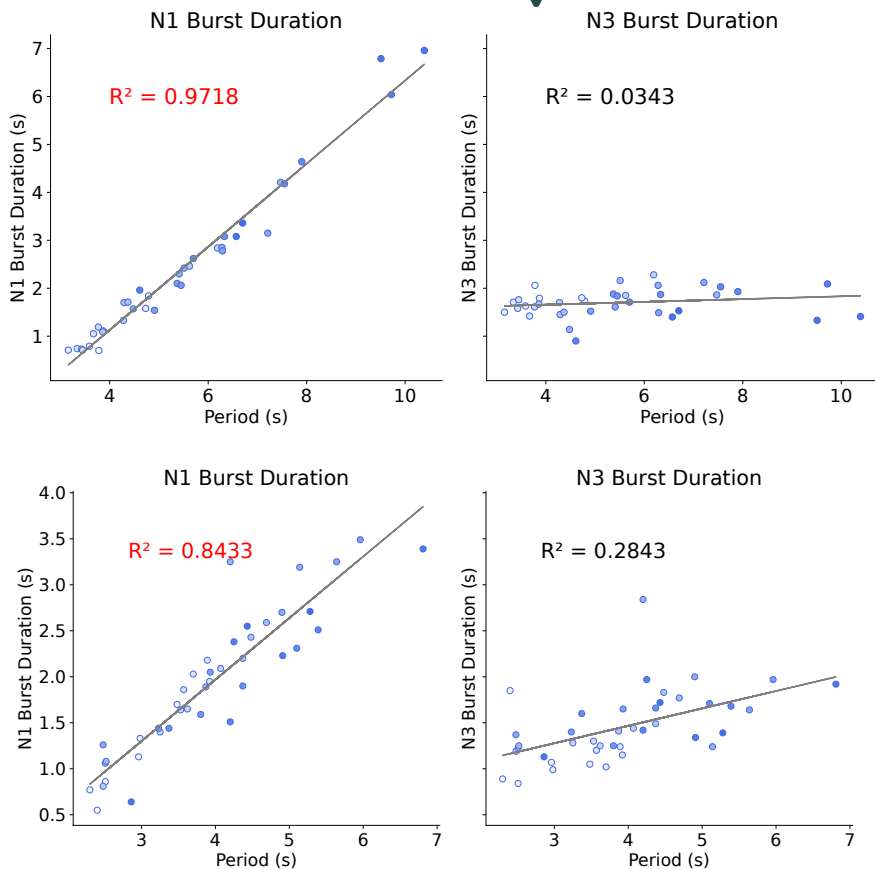


Study of the Sequential nature in neuronal dynamics

Case of study

Feeding CPG
Lymnaea stagnalis

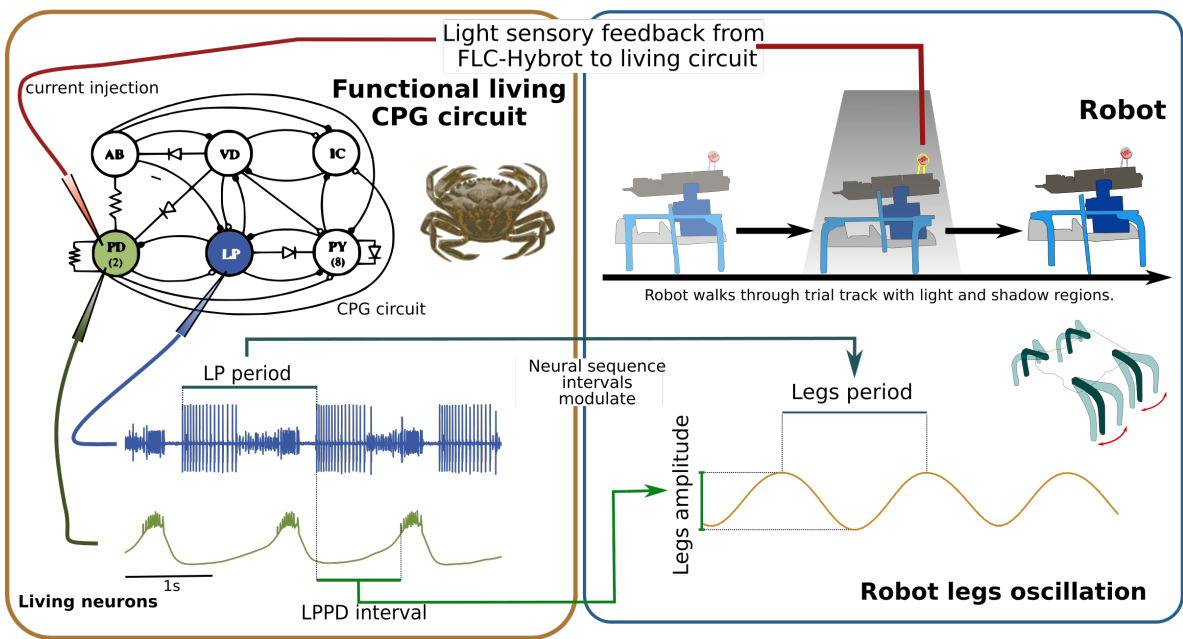
Experimental approach



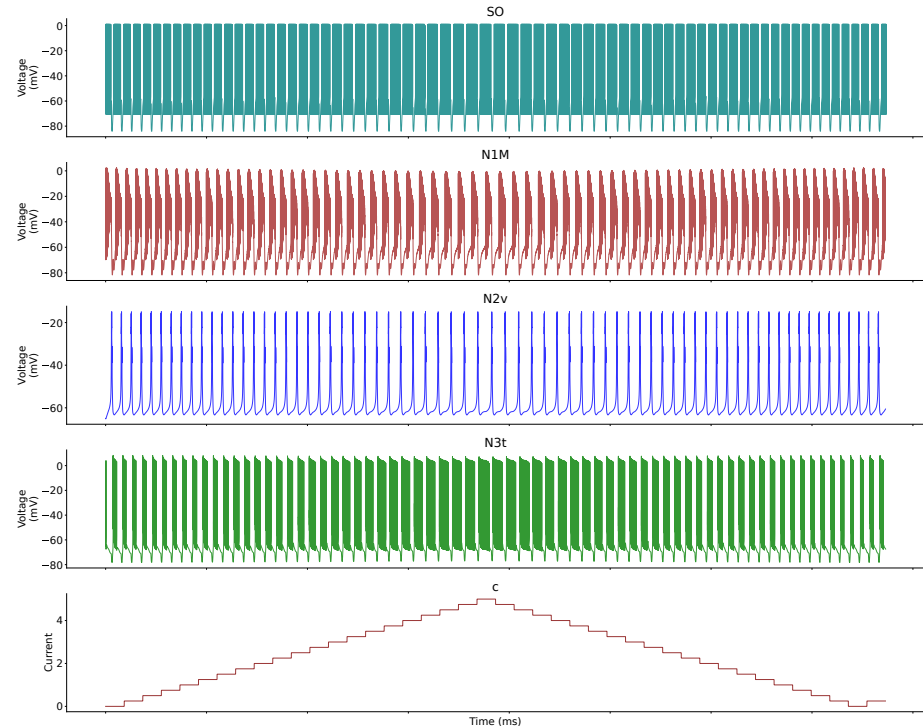
Presence of
dynamical invariants
under different cases
of stimulation

Universality of
sequential dynamical
invariants

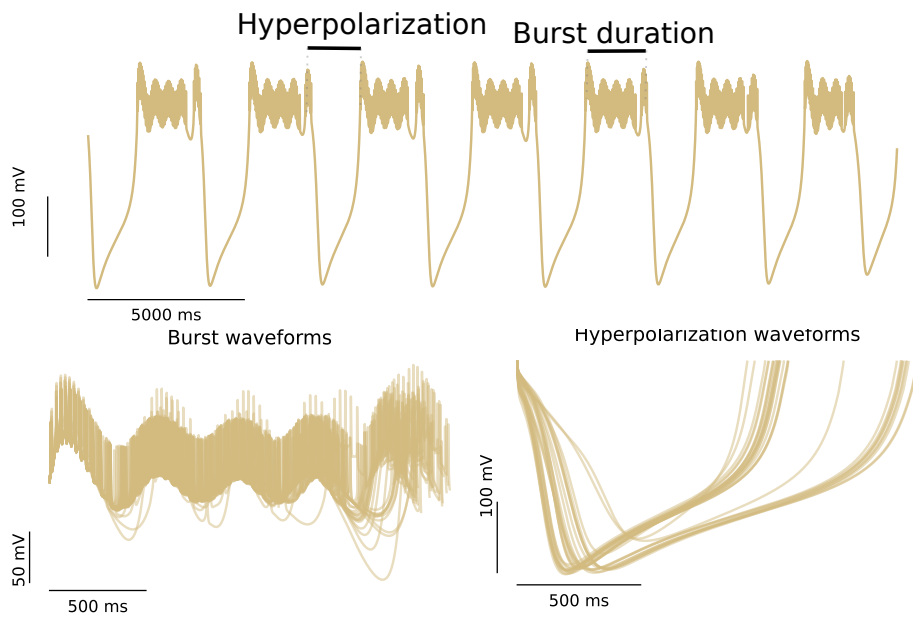
Transformation of sequential intervals
into effective robot movement



Computational approach



Importance of reproducing the
functional variability in
computational models

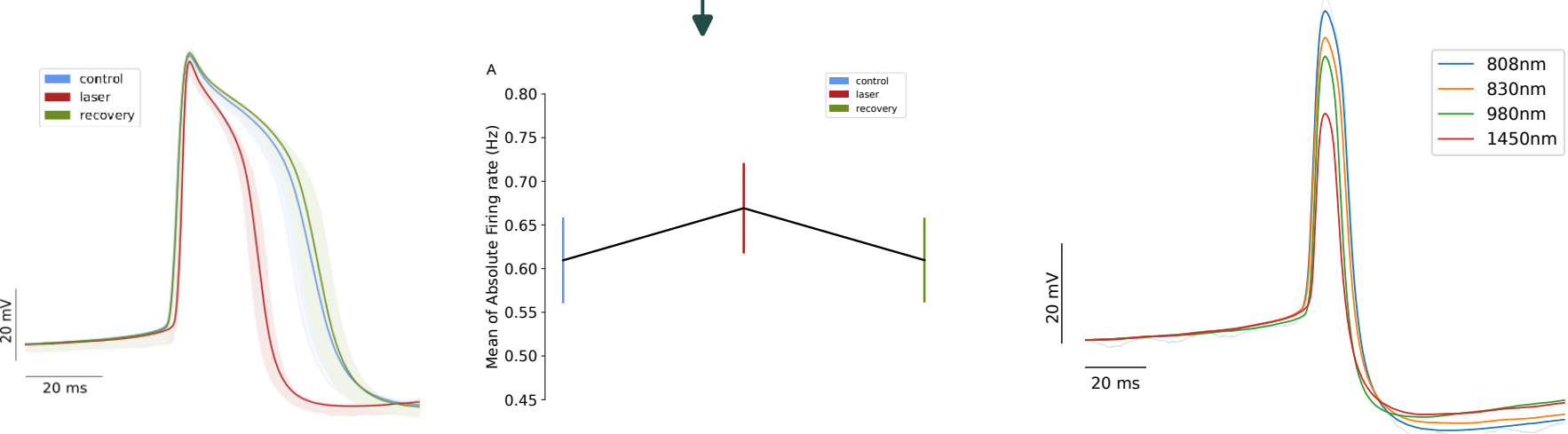


Stimulation Technique to study it

CW-NIR Infrared laser

Single neurons in RPG
Lymnaea stagnalis

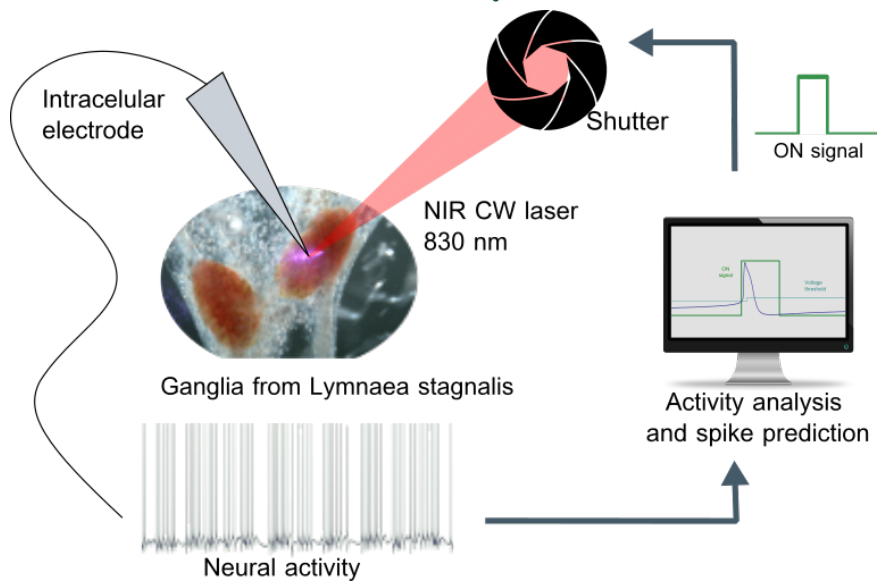
Sustained illumination



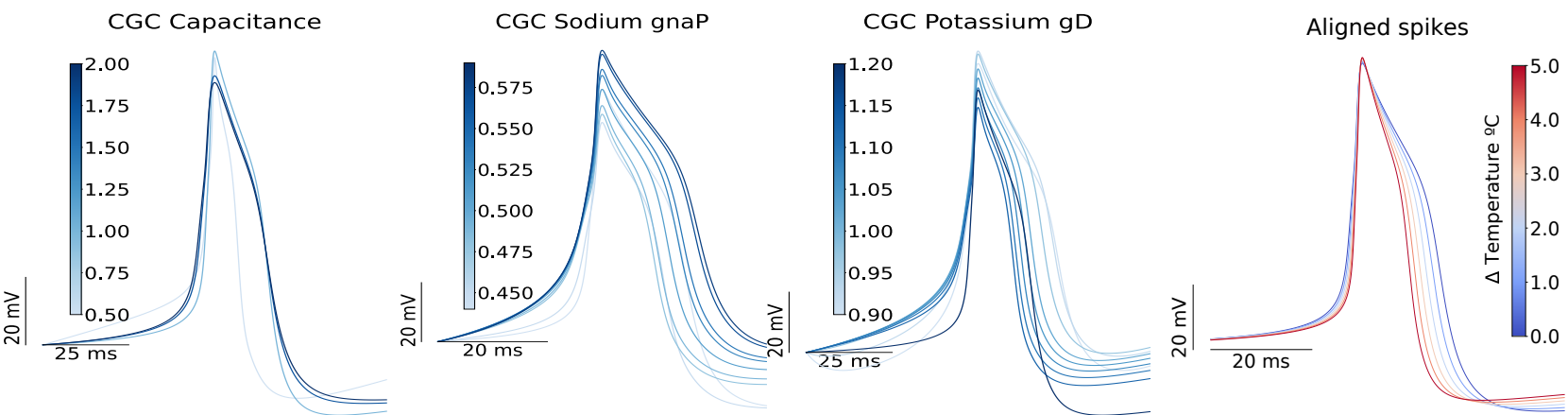
Sutained laser stimulation
accelerates the action potential

Under the effect of different
laser wavelengths, the metric
changes are different

Activity-dependent protocol



With the activity dependent protocol we could
assess the action potential sequential
generation at different time instants



No candidate alone in the model could reproduce the effect and a
global change when simulating the temperature dependency
reproduced better the observed effect

The closed-loop protocol unveiled the CW-laser
effect at different phases of the neuron
dynamics, shifting the maximum effect at
different spike generation times

