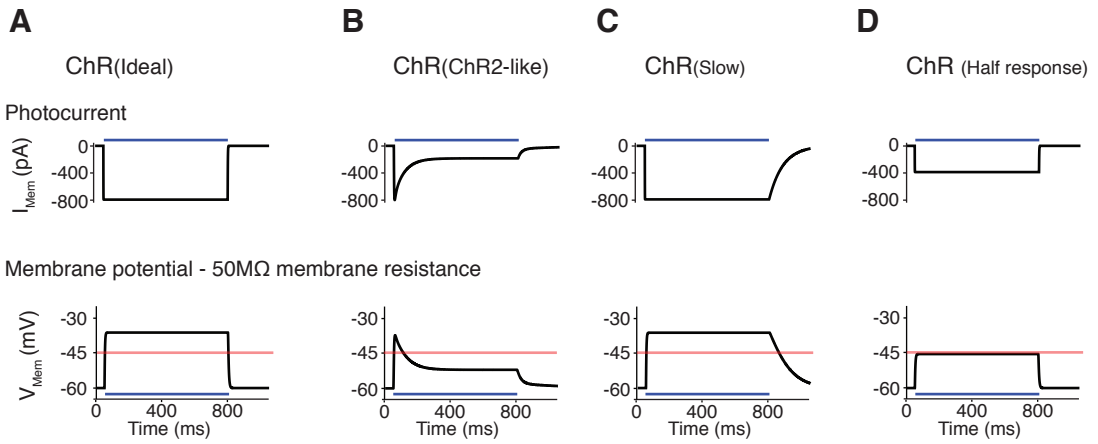
Suplementary figure 1



Supplementary Figure 1. The theoretical changes of the membrane potential induced by ChRs of different properties with continuous light stimulation on a passive membrane model. (A) ChR(Ideal) would have no desensitisation and near-instantaneous kinetics, which leads to a rectangular photocurrent response and near-rectangular membrane depolarisation. (B) ChR with ChR2-like properties such as ChR2 (ChR(ChR2-like)) would result in reduced depolarisation after desensitisation. (C) ChR with slow off-rate kinetics (ChR(Slow)) would result in slow membrane repolarisation after the termination of light pulse. (D) Reduction of channel conductance/level of membrane expression (ChR(Half response)) can result in insufficient depolarisation over threshold.
The stimulations light pulses were indicated by blue lines
Modelling parameters:
Membrane capacitance = 80pF,
Membrane resistance = 50MOhm,
Membrane potential = -60mV,
Threshold = -45mV (red lines),
ChR reversal potential = 0mV,
ChR current = 10pA/pF except for ChR(Half response) where the response = 5pA/pF.