

‡ **Electronic Supplementary Information (ESI): Abbreviations**

Optogenetic modulation of real-time nanoscale dynamics of HCN channels using photoactivated adenylyl cyclases

Meenakshi Tanwar, Suneel Kateriya, Deepak Nair, Mini Jose

BLUF Blue Light Using FAD

cAMP Adenosine 3',5'-cyclic monophosphate

CHD Cyclase Homology Domain

CNBD Cyclic nucleotide binding domain

dSTORM Direct stochastic optical reconstruction microscopy

HCN Hyper polarization-activated cyclic nucleotide

MSD Mean Square Displacement

N2a Neuro-2a

PAC Photoactivated adenylyl cyclases

PALM Photoactivation Localization Microscopy

P2A- Self-cleaving 2A peptide derived from Porcine Teschovirus-1

SPT Single particle tracking

SRRF Super-Resolution Radial Fluctuations

TIRF Total Internal Reflection Fluorescence

T2A- Self-cleaving 2A peptide derived from *Thosea asigna* virus