**Supplementary File1a. MICU1 effect on MCUcx as determined by previous electrophysiological experiments.**

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| --- | --- | --- |
| **Citation** | **MCU current** | |
| **Low [Ca2+]cyto** | **High [Ca2+]cyto** |
| (Hoffman et al., 2013) |  | Inhibition |
| (Patron et al., 2014)  Lipid bilayer experiments;  EMRE subunit, essential for MCU activity and MICU1 interaction, was absent | No effect | Activation |
| (Vais et al., 2016) |  | No change |
| (Kamer et al., 2018) |  | No change |

**Supplementary File1b. MICU1 effect on MCUcx as determined by previous Ca2+ imaging experiments.**

|  |  |  |
| --- | --- | --- |
| **Reference** | **Effect of MICU1 on**  **mitochondrial Ca2+ uptake** | |
| **Low [Ca2+]cyto** | **High [Ca2+]cyto** |
| (Mallilankaraman et al., 2012) | Inhibition | No effect |
| (Hoffman et al., 2013) | Inhibition | Inhibition |
| (Plovanich et al., 2013) |  | Activation |
| (Csordas et al., 2013) | Inhibition | Activation |
| (de la Fuente et al., 2014) | Inhibition | Activation |
| (Kamer and Mootha, 2014) | Inhibition |  |
| (Logan et al., 2014) | Inhibition | No effect |
| (Patron et al., 2014) | Inhibition | Inhibition |
| (Hall et al., 2014) |  | Inhibition |
| (Antony et al., 2016) | Inhibition | Activation |
| (Liu et al., 2016) | Inhibition | Activation |
| (Bhosale et al., 2017) | Inhibition |  |
| (Kamer et al., 2017) | Inhibition |  |
| (Paillard et al., 2018) | Inhibition | Activation |
| (Phillips et al., 2019) | Inhibition |  |

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