# A mathematical modeling toolbox for ion channels and transporters across cell membranes

Shadi Zaheri[a], Fatemeh Hassanipour[a,*]

[a]*Department of Mechanical Engineering, The University of Texas at Dallas, Richardson, TX, 75080, USA*

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The following supplementary material is from " A mathematical modeling toolbox for ion channels and transporters across cell membranes" manuscript. It contains an overview of all equations related to Ion channels, Pumps, Cotransporters, and Symporters, organized in a table form. The detailed transporters along with the descriptions of their equatuons can be found from here.

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*Corresponding author

*Email addresses:* shadi.zaheri@utdallas.edu (Shadi Zaheri), fatemeh@utdallas.edu (Fatemeh Hassanipour)

### 1.1.4. *ATP-sensitive Potassium (K) Channel (KATP)*

| **ATP-sensitive Potassium (K) Channel (KATP)** | **Ref** |
|---|---|
| $$\boxed{I_{K,K_{ATP}} = g_{K_{ATP}} f_o^{K_{ATP}} \left( V_m^{M-N} - V_{K,rev}^{M-N} \right)} \quad (26)$$ where $$g_{KATP} = g_{KATP}^{max} \left( \frac{[K]_o}{[K]_{ref}} \right)^{n_{KATP}} \quad (27)$$ $$f_o^{KATP} = \frac{1}{1 + \left( \frac{[ATP]_i}{k_{0.5}} \right)^{\eta_{KATP}}} \quad (28)$$ | [2, 10] |

Table 2: The corresponding equations describing the ionic current transported via ATP-sensitive potassium (K) channel (KATP) across the cell membrane