

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*

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

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*Corresponding author

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

25 2.3. *Hydrogen-Potassium ATPase (H/KATPase)*

Hydrogen-Potassium ATPase (H/KATPase)	Ref
$J_{Na,HK-ATPase}^{net} = k_{Na}^{lc}[P_iNa]_l - k_{Na}^{cl}[P_iNa]_c \quad (115)$	[39]
$J_{K,HK-ATPase}^{net} = k_K^{lc}[K]_l - k_K^{cl}[K]_c \quad (116)$	
$J_{H,HK-ATPase}^{net} = k_H^{lc}[P_iH]_l - k_H^{cl}[P_iH]_c \quad (117)$	
$J_{NH4,HK-ATPase}^{net} = k_{NH4}^{lc}[NH4]_l - k_{NH4}^{cl}[NH4]_c \quad (118)$	

Table 12: The corresponding equations describing the flux and current transported via Hydrogen-Potassium ATPase (H/KATPase) pumps across the cell membrane