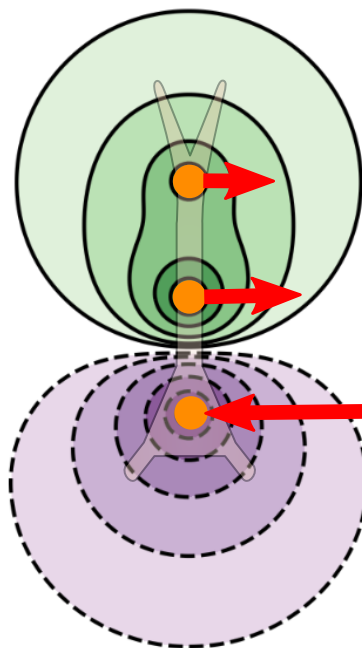


transmembrane
currents
axial currents

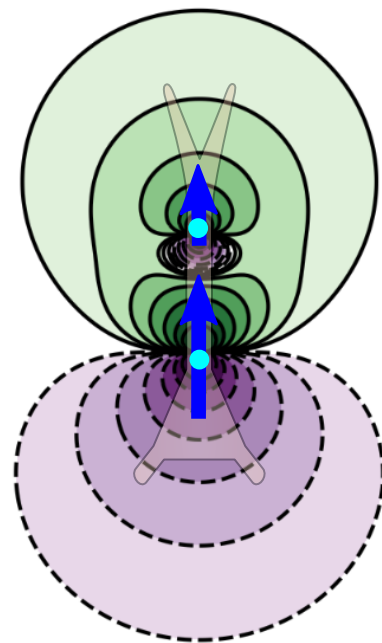
B compartment based

$$\frac{1}{4\pi\sigma} \sum_n \frac{I_n^t}{|\mathbf{r} - \mathbf{r}_n^t|}$$



C dipole based

$$\frac{1}{4\pi\sigma} \sum_n \frac{|I_n^a \mathbf{d}_n| \cos \theta}{|\mathbf{r} - \mathbf{r}_n^a|}$$



current conservation:

$$I_1^t = -I_1^a$$

$$I_2^t = I_1^a - I_2^a$$

$$I_3^t = -I_2^a$$

$$I_1^t + I_2^t + I_3^t = 0$$