



**Fig. S2: Setup-specific data scatter**

Impedances of an artificial membrane mounted in an Ussing chamber ( $R^T \approx 500 \Omega \cdot \text{cm}^2$ ) were repeatedly recorded at 42 different frequencies,  $f$ . As an example, values recorded at five different frequencies ( $f \approx 1.6, 16, 160, 1600, \text{ and } 16000 \text{ Hz}$ ) are shown. Scatter of  $Z^{re}$  and  $Z^{im}$  increased with increasing  $f$  and with increasing  $R^T$  of the artificial membrane (not shown).