Yikes! Midterm paper due Thursday, March 27

### Ion concentrations

<table>
<thead>
<tr>
<th>Ion</th>
<th>External (mM)</th>
<th>Internal (mM)</th>
<th>Nernst potential (mV)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Frog muscle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>2.25</td>
<td>124</td>
<td>-101</td>
</tr>
<tr>
<td>Na</td>
<td>109</td>
<td>10.4</td>
<td>+59</td>
</tr>
<tr>
<td>Cl</td>
<td>77.5</td>
<td>1.5</td>
<td>-99</td>
</tr>
<tr>
<td>Squid axon</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>20</td>
<td>400</td>
<td>-75</td>
</tr>
<tr>
<td>Na</td>
<td>440</td>
<td>50</td>
<td>+55</td>
</tr>
<tr>
<td>Cl</td>
<td>560</td>
<td>40</td>
<td>-66</td>
</tr>
</tbody>
</table>

Why does the line deviate from the K theoretical values at lower [K]?
Squid giant axon - a model prep

Squid giant axon - membrane prep

Squid giant axon - RP experiment

Squid giant axon - experimental chamber

40,000 APs can fire!
At Rest: $\text{INa} = \text{IK}$?

$\text{V} = \text{IR}$

$I_K = g_K (V_m - E_K)\quad I_{Na} = g_{Na} (V_m - E_{Na})$

$g_K (V_m - E_K) = g_{Na} (V_m - E_{Na})$

At Rest: RP in neurons is never as negative as $K_{eq}$. Why?

$INa = IK$?

At Rest: $g_K 50X > g_{Na}$

Other contributions to RP?

Membrane Model at Rest
Changes in “RP” by changing ionic conductances- movie

Synaptic Transmission Refresher

Types of Chemical Synaptic Transmission?

Synaptic transmission
1) signal transmission between NS components and effectors
2) A site of plasticity for learning and memory
3) A site of action for disease, psychoactive drugs

direct, fast ionotropic
indirect, ~slow metabotropic
Ionotropic Transmission

Stimulate presynaptic axon

Synapse tutorial
AP/PSP, page 7
See Synapse Tutorial on class web site for review

Steps in ionotropic chemical synaptic transmission

NEUROSCIENCE, Fourth Edition, Figure 5.3