|  |  |  |
| --- | --- | --- |
| **Item** | **Value** | **Notes** |
| Hair cell dimensions | **10 um x 30 um** | *Hair bundle is about 5 um wide* |
| Hair bundle dimensions | **5 um wide** | *In bullfrog, variable* |
| Number of stereocilia | **50-100** | *Variable within sacculus* |
| Number of tip links | **~1** | *~1 mN/m* |
| Number of myosin motors | **12- 24** | *Active motors* |
| Force of myosin motors | **12-21 pN** | *~1 pN/motor* |
| Displacement in vivo | **0.3 nm at threshold** | *~diameter of Au atom* |
| Stereociliary pivot stiffness | **200 uN/m (combined)** | *Found by calcium chelation* |
| Hair bundle stiffness | **1 mN/m (large deflection)** |  |
| Tip link stiffness | **~1 mN/m** |  |
| Compliance of membrane (tenting) |  | *Possibly dependent on Myo2a at tips* |
| Endolymph | **117.5 mM K+, Low Ca** |  |
| Perilymph | **114 mM Na+, High Ca** |  |
| Endocohlear potential | **+80 mV** | *Due to endolymph/perilymph* |
| Resting potential | **-70 mV** | *Measured in mudpuppy* |
| Calcium reversal potential | **~100 mV** | *Intra – 100 nM; Extra – 250 uM* |
| Depolarization upon deflection | **Max 0.5 nA at 0.3 um** | *Sigmoid curve, reverse at 0.3nA/0.15um* |
| Calcium pump conductance | **24 pS (chick cochlea)** | *PMCA, 1 Ca / ATP (NCX – Na/Ca exch)* |
| Rate of fire at rest | **100 Hz** | *Afferent* |
| Rate of fire when depolarized | **200-300 Hz** |  |
| Prestin movement | **Max <1 um** | *Dependent upon voltage change* |
| Number of actin filaments | **>3000 at tip, 18-29 at base** |  |
| Number of microtubules | **9+0** |  |
| Persistence length of actin | **15-20 um** | *Measured for bundled actin* |
| Persistence length of microtubules | **5,200 um** |  |
| Otolithic membrane | **25-30 um matrix** | *5-10 um columnar layer to epithelium* |
| Otolithic crystals | **< 10 um, 2.71 g/cm3** |  |
| Drag coefficient of hair bundle | **200 nN-sec-m-1** | *Howard and Hudspeth, 1988* |
| Gating spring stiffness (k) | **400-500 uN/m** | *k* |
| Gating swing distance (d) | **~8 nm** | *d* |
| Geometrical gain (g) | **0.14** | *g* |
| Single channel gating force | **~0.7 pN** | *z = gkd* |
| Open probability of MET channels | **~0.15** |  |
| MET channel conductance | **150-300 pS** | *Peng/Ricci, Nat Comm, 2011* |
| Number of MET channels | **~50 (1-2 per stereocilium)** | *Block with amiloride* |
| Energy change w MET channel opening | **10 kT** |  |
| Fast adaptation time constant | **1-3 ms** |  |
| Slow adaptation time constant | **> 10-15 ms** |  |
| Tip-link length | **180 nm** | *CDH23 (top) – 130 nm; PCDH15 – 52 nm* |
| Dissociation Constant, Calcium (TL) | **1 uM** | *Concentration for stable TL* |