### S5 Table. Plasticity

<table>
<thead>
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<th>Type</th>
<th>Description</th>
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| **mSTDP**                     | $W$ and $Q$ initialized separately, uniformly distributed in range $(0, W_{\text{init}})$. For visible unit $i$, hidden unit $j$, feedforward learning rate $\eta$:  
  $\Delta w_{ij} = \Delta q_{ji} = \eta \sum_{k \in S_i} \sum_{l \in S_j} \left\{ +e^{-|t_l-t_k|/\tau_+} \quad \text{if } t_l > t_k \\
  -e^{-|t_l-t_k|/\tau_-} \quad \text{if } t_l \leq t_k \right\}$  
  Weights to-from inhibitory pools $W_{\text{Vis,Inh}}$ initialized separately from exponential distributions with means $W_{\text{Vis,Inh}}$ etc, and do not undergo plasticity. |
| **Homeostatic adaptation**    | Synaptic scaling factors initialized to $\phi_{\text{init}}$ or $\Phi_{\text{init}}$. $\Delta \phi_j = \Delta \Phi_j = \beta (\rho - A_j)$  
  $\rho$ = target activation rate, $A_j$ = average activation, initialized equal to 0 and updated after each presentation via  
  $A_j \left\{ \begin{array}{ll}
  e^{1/\tau_r} A_j + (1 - e^{1/\tau_r}) & \text{if neuron } j \text{ active during the presentation} \\
  e^{1/\tau_r} A_j & \text{otherwise}
  \end{array} \right.$ |