Arc With Type-I 5-HT neurons **Punishment** Reward а **Connection type** VTA DRN DRN VTA VTA VTA DRN DRN VTA VTA **GABA** DA 5-HT **GABA** Glu DA 5-HT **GABA GABA** Glu  $DA \rightarrow$ 5HT→ VTA 5HT→ Glu (-) 64.43 4.56 7.36 0.34 0.50 64.01 13.85 5.82 3.68 0.72 **GABA** DA 5HT→ (-)(-)7.35 0.38 2.37 Glu (+) 66.19 4.91 0.50 63.46 5.86 0.46 0.66 5-HT→ 5HT→ **VTA** 5HT→ Glu (-) 67.34 4.47 7.35 0.34 0.50 64.88 2.13 5.85 0.40 0.66 **GABA** DA 5HT→ (-)(+)Glu (+) 66.19 4.91 7.35 0.38 0.50 61.98 1.55 6.05 1.24 0.64 DA-> 5HT→ VTA 5HT→ 64.91 4.18 17.41 0.94 0.50 64.50 13.81 6.56 4.27 0.72 Glu (-) **GABA** DA 5HT→ (+) (-)Glu (+) 66.66 4.53 17.41 0.97 0.50 63.95 2.29 6.54 1.04 0.66 5-HT→ 5HT→ **VTA** 5HT→ Glu (-) 67.82 4.10 17.40 0.93 0.50 65.37 2.05 6.53 0.98 0.66 **GABA** DA 5HT→ (+)(+) 66.66 4.53 17.41 0.97 0.50 62.47 1.59 6.38 0.66 0.64 Glu (+) b 5HT→Glu (-) 66.73 6.05 8.47 1.02 0.50 64.09 4.23 11.30 1.16 0.67 5HT→Glu (+) 60.91 3.31 8.59 0.38 4.95 56.91 2.67 11.46 0.45 6.54 66.66 2.22 8.58 0.27 0.00 64.02 1.70 11.45 C 0.30 0.00 d 66.81 4.67 1.01 0.44 0.00 64.27 3.31 1.05 0.55 0.00 64.99 2.45 0.04 0.12 0.00 62.02 1.90 0.04 0.12 0.00 е f 64.63 2.27 0.45 0.00 61.55 1.52 0.22 0.00 0.17 0.52 g 65.00 0.00 2.35 0.00 0.00 61.99 0.00 2.59 0.00 0.00 h 65.37 4.69 0.16 0.44 0.00 62.47 3.33 0.24 0.00 0.55 62.15 0.00 0.00 0.00 0.00 58.45 0.00 0.00 0.00 0.00 0.00 67.86 0.00 0.00 0.00 65.54 0.00 0.00 0.00 0.00 k 65.00 0.00 0.00 0.00 61.99 0.00 0.00 0.00 0.00 0.00 5HT→DA (-) 67.33 5.23 2.12 7.44 1.13 0.49 65.22 1.76 1.67 0.65 5HT→DA (+) 1.14 1.81 5.22 65.50 2.17 7.45 0.49 62.69 1.67 0.65