



Proskurin, Manakov and Karpova, Figure 3 - figure supplement 2 | Representational transitions are less prominent in the caudal portion of the medial frontal lobe. **a.** Pharmacological inactivation of a putative rat homologue of the Supplementary Motor Cortex (SMC) impairs self-guided higher order action sequencing. **Left panels:** schematic of muscimol delivery to the rostral part of agranular secondary motor cortex M2, putatively FOF (**top**), or posterior part of M2, putatively SMC (**bottom**). **Right panels:** Performance on the self-guided sequence task (as average reward rate) during saline and muscimol injections in the target region. Animals sample the ‘non-preferred’ option irrespective of the relative reward rate. Note that the basic sequencing of actions pairing initiation port and side port entries to complete a trial is not impaired when the putative rat SMC is inactivated. **b.** Heat map representations of normalized activity associated with ‘Right-Right-Left’ sequence execution for 16 simultaneously recorded SMC neurons. Activity profiles across different sequence instances are stacked vertically. ‘exp’- ‘exploratory’ instances. Neurons are arranged according to a ‘transition score’ defined as the distance between the two cloud centroids normalized by root mean of variance within each cloud. Transition score range reflected on the plot was chosen to match that in Figure 3b. **c.** Fraction of SMC neurons displaying significant context-related transition in each of the five analysis windows.