



# Time Following Initial Acquisition is Sufficient to Make Signaled Active Avoidance Dependent on the Retrosplenial Cortex

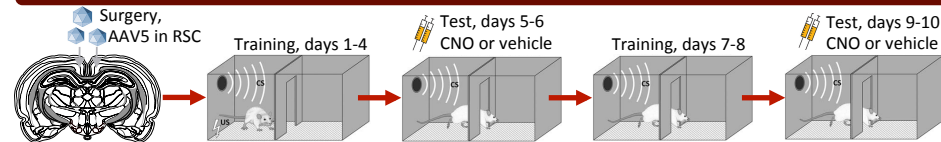
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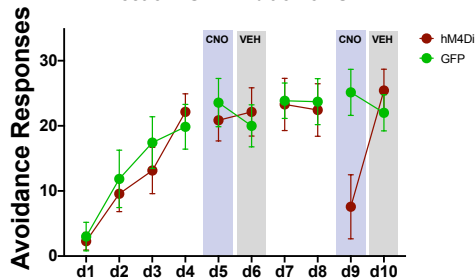
## Introduction

- Signaled active avoidance (SAA) behavior involves a multistage learning process supported by a shifting neural substrate.
- It is unknown whether the mechanisms underlying the maintenance of avoidance are brought online by continued training following acquisition, or whether time alone is sufficient to recruit them, suggesting a role for a systems consolidation-like process.
- Because it plays a known role in the long-term maintenance of aversive memory, we hypothesized that the retrosplenial cortex (RSC) is necessary for the expression of avoidance after substantial training.
- We inactivated the RSC using the inhibitory hM4Di DREADD and then measured avoidance responses on a two-way SAA paradigm at different time points to show that the RSC is recruited later on in avoidance. Utilizing the same DREADD technology, we then set out to determine if the RSC is recruited by the passage of time or by continued training following initial acquisition.

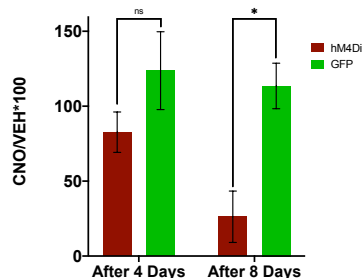
## Recruitment of the Retrosplenial Cortex in SAA



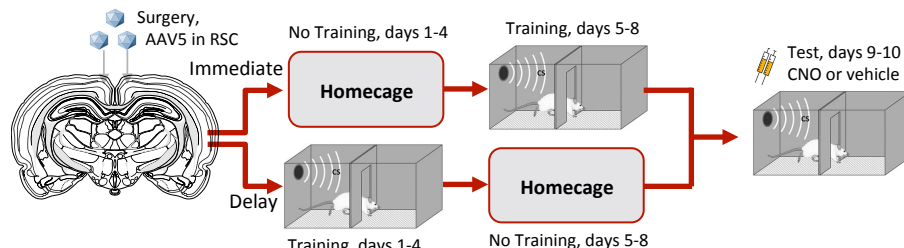
Effect of RSC Inhibition on SAA



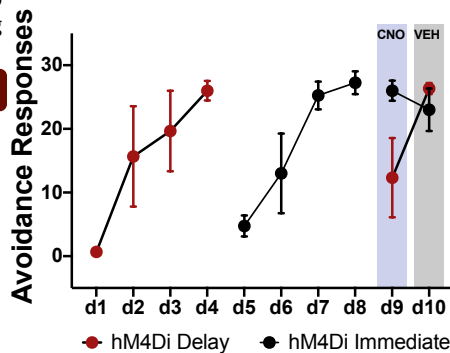
Avoidance



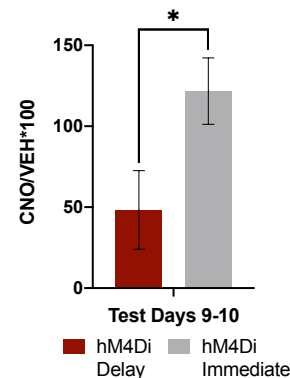
## The Effect of Time on the Recruitment of the Retrosplenial Cortex



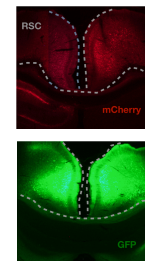
hM4Di SAA Training and Tests



Avoidance



Representative Histology for Experiments 1 & 2



## Findings

- Our data confirm that the RSC plays a role in the long-term maintenance of the avoidance response, and that the RSC is recruited to SAA by a systems consolidation-like mechanism and not by continued training following initial acquisition of the response.