

EFFECTS OF ANTIDEPRESSANTS ON *Daphnia magna*'s BEHAVIOURAL RESPONSE

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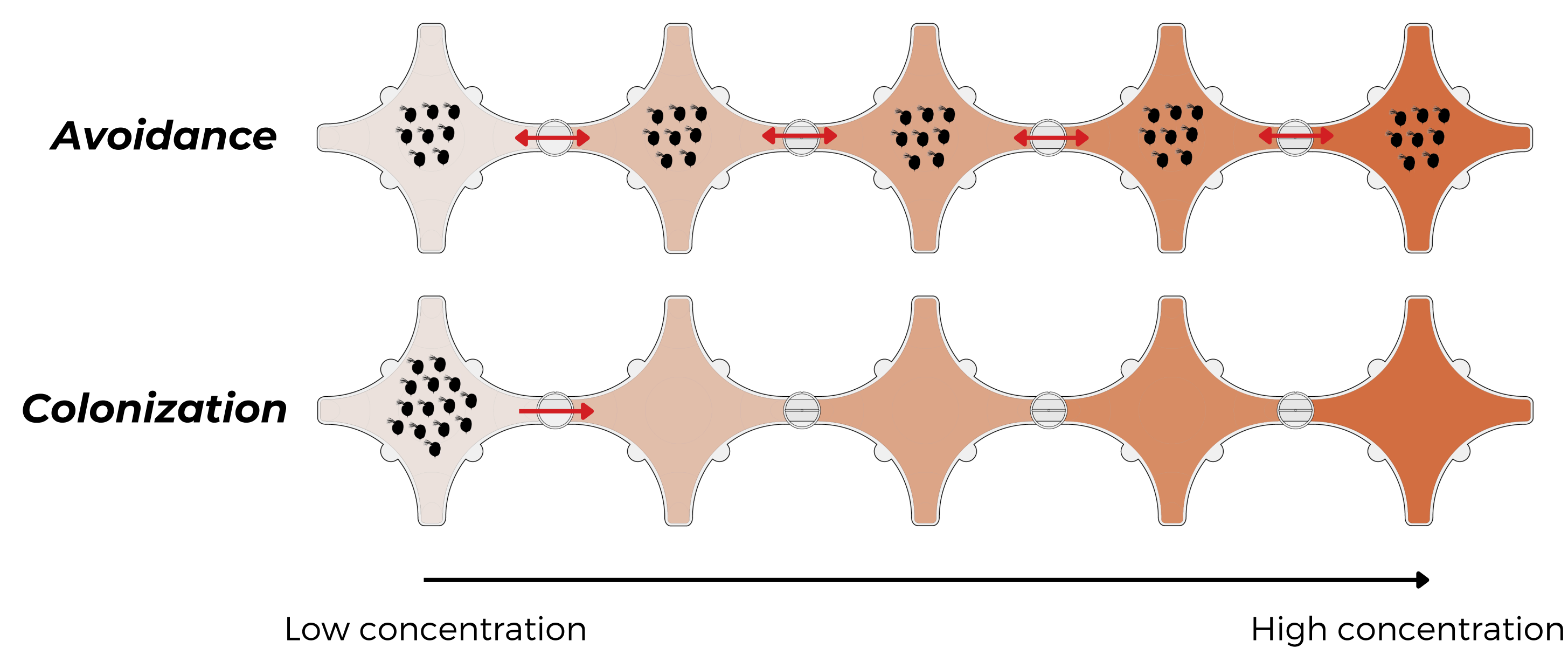
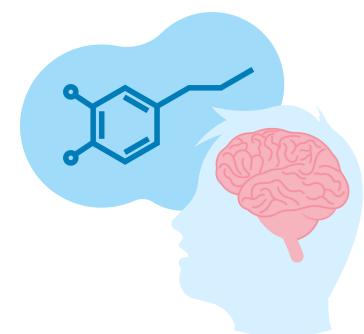


INTRODUCTION



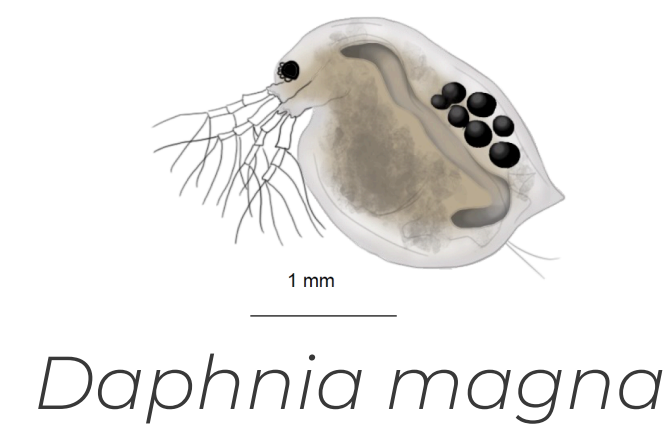
Selective serotonin reuptake inhibitors (SSRIs) are commonly used as antidepressant to treat mental disorders like depression.

Specifically, their modes of action is to **block serotonin reuptake** and thus keep high serotonin levels.



MATERIALS AND METHODS

Test organism



Daphnia magna

Experimental conditions

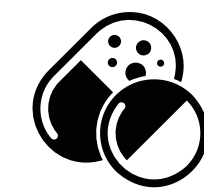
- 40 organisms per replicate
- Distribution of organisms every 1 hour
- 24 hours

Endpoints



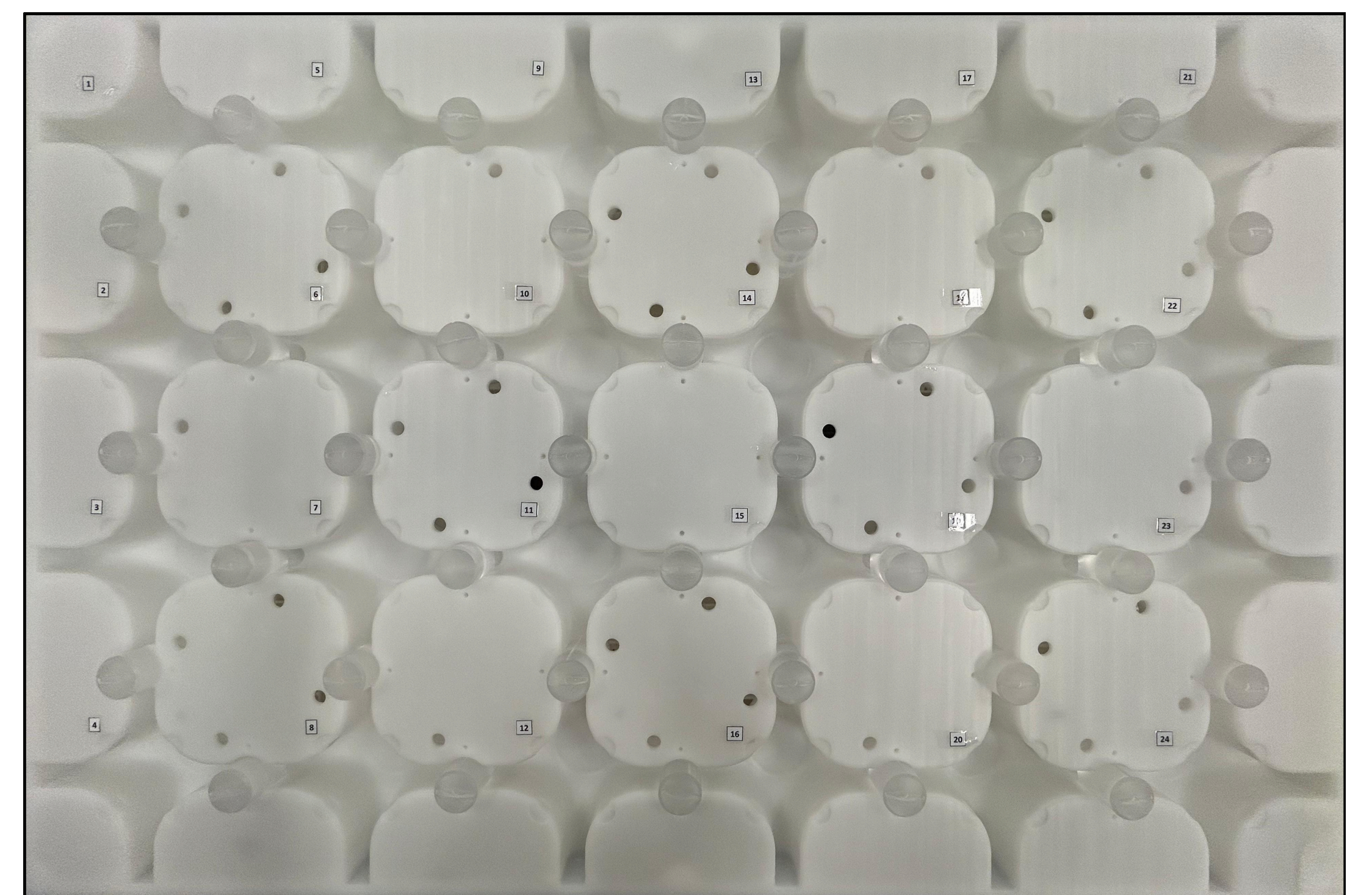
Avoidance
Colonization

Contaminants



Sertraline
Citalopram

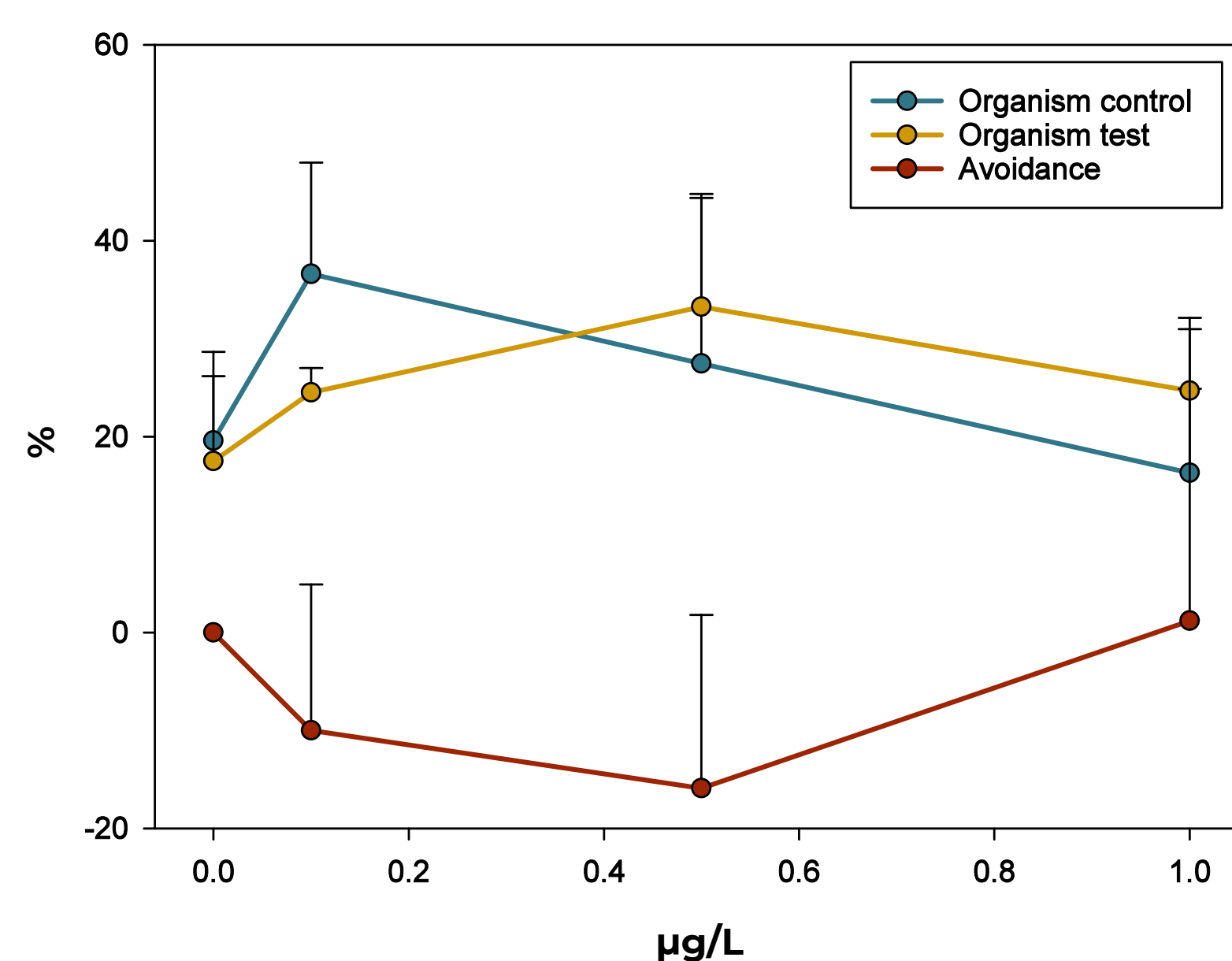
HeMHAS -Heterogeneous Multi-Habitat Assay System (version #3) is a non-forced aquatic assay system



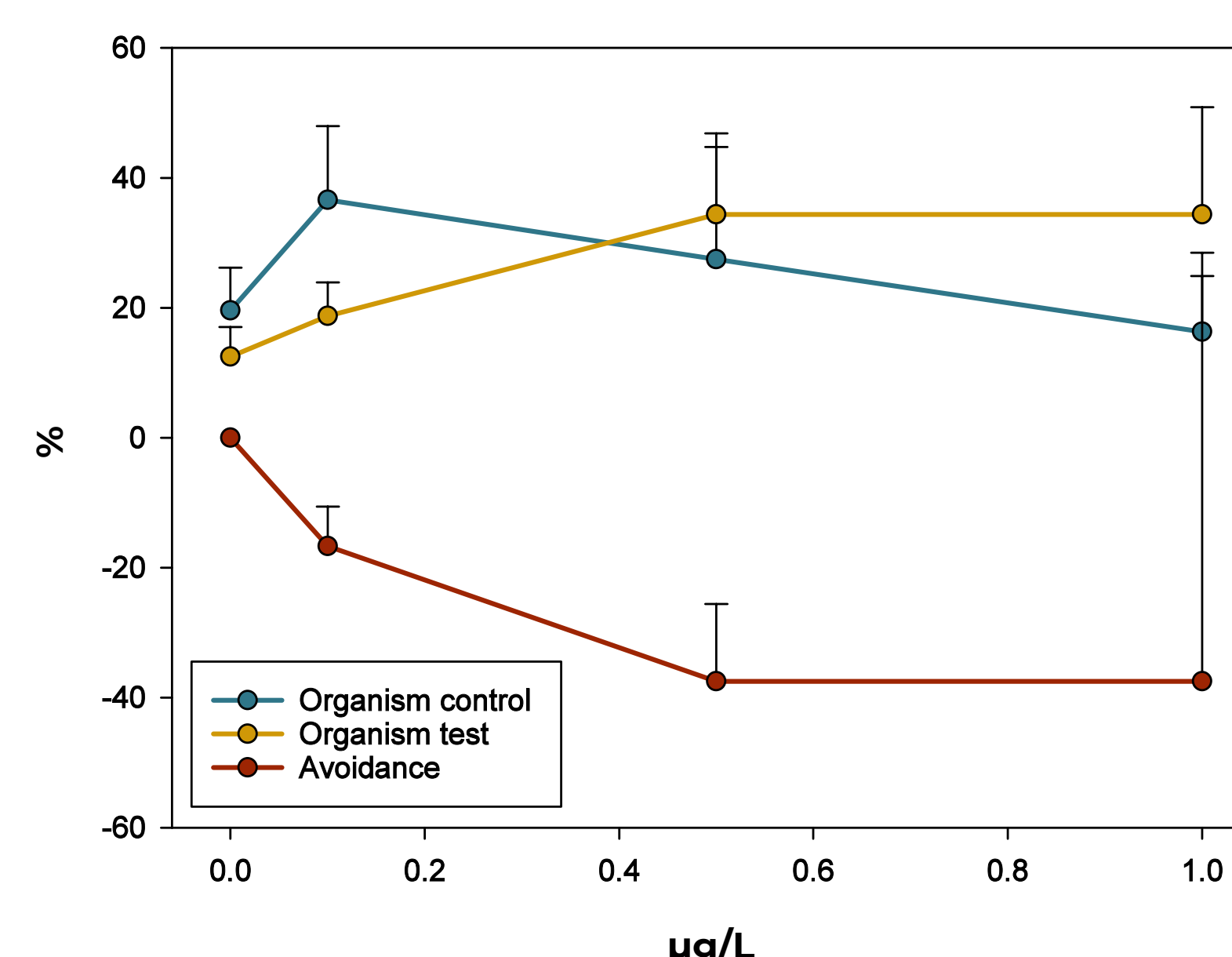
RESULTS

1 AVOIDANCE TEST

Citalopram



Sertraline

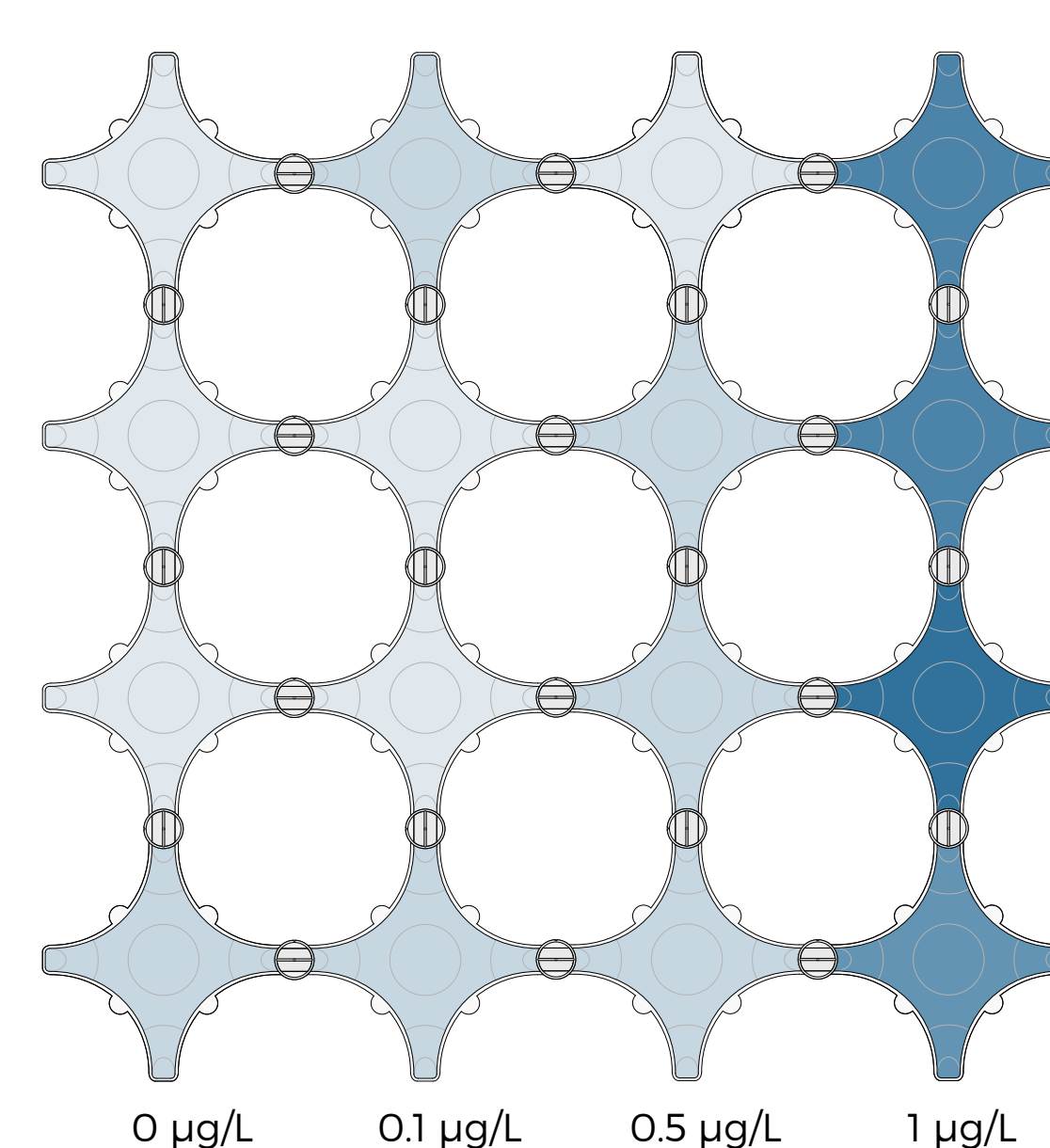


The response to **sertraline** was **concentration-dependent** ($p < 0.05$), with a significantly **higher percentage of organisms** in the compartments of **1 µg/L**, compared with control.

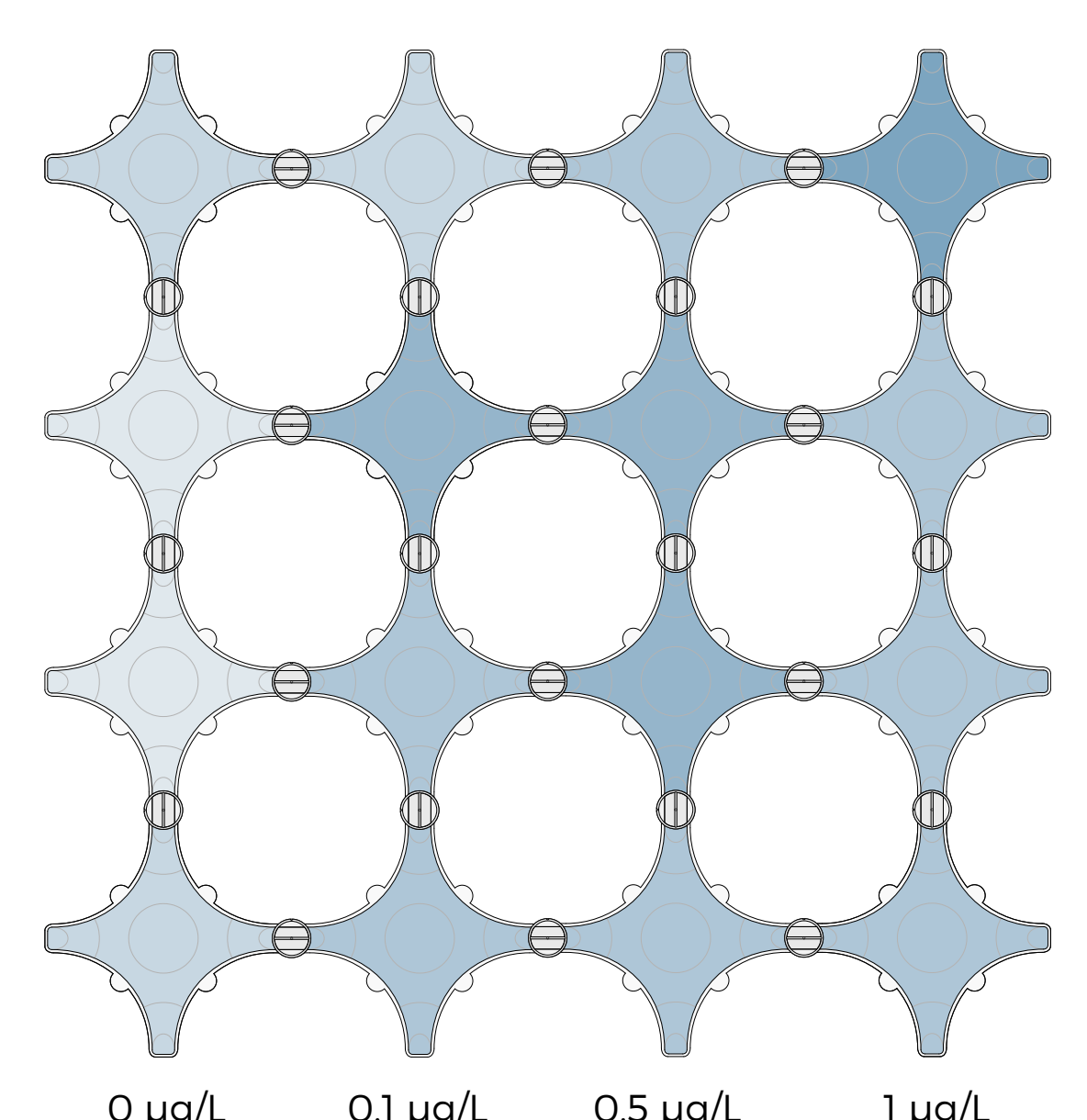
Citalopram caused also a **concentration-dependent attraction** ($p < 0.05$), although the distribution of organisms was more homogeneous between compartments.

2 COLONIZATION TEST

Citalopram



Sertraline



Organisms lasted shorter time to reach the highest **sertraline** concentration. The organisms only needed **90 min to reach the last compartment**, instead of 210 min as in the case of control.

In presence of **citalopram**, organisms needed more time to reach the compartment with 1 µg/L of contaminant. However, after 24 h the **percentage of organisms** in that compartment **was two-fold of** organisms found in the highest concentration of **sertraline**.

CONCLUSIONS

We observed that there was no avoidance by *D. magna* to these pharmaceuticals.

These results suggest the influence of this type of pharmaceuticals on the free distribution of organisms, causing a possible attraction.

This attraction can mask the potential risk of the pharmaceuticals and disrupt the ability of organisms to detect other contaminants and other environmental stressors.

ACKNOWLEDGMENTS



BeingBehavior Project