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INTRODUCTION

Rapid growth in electronics over the last two decades, driven by digitalization, has led to increased generation of e-wastes, posing a global environmental challenge.

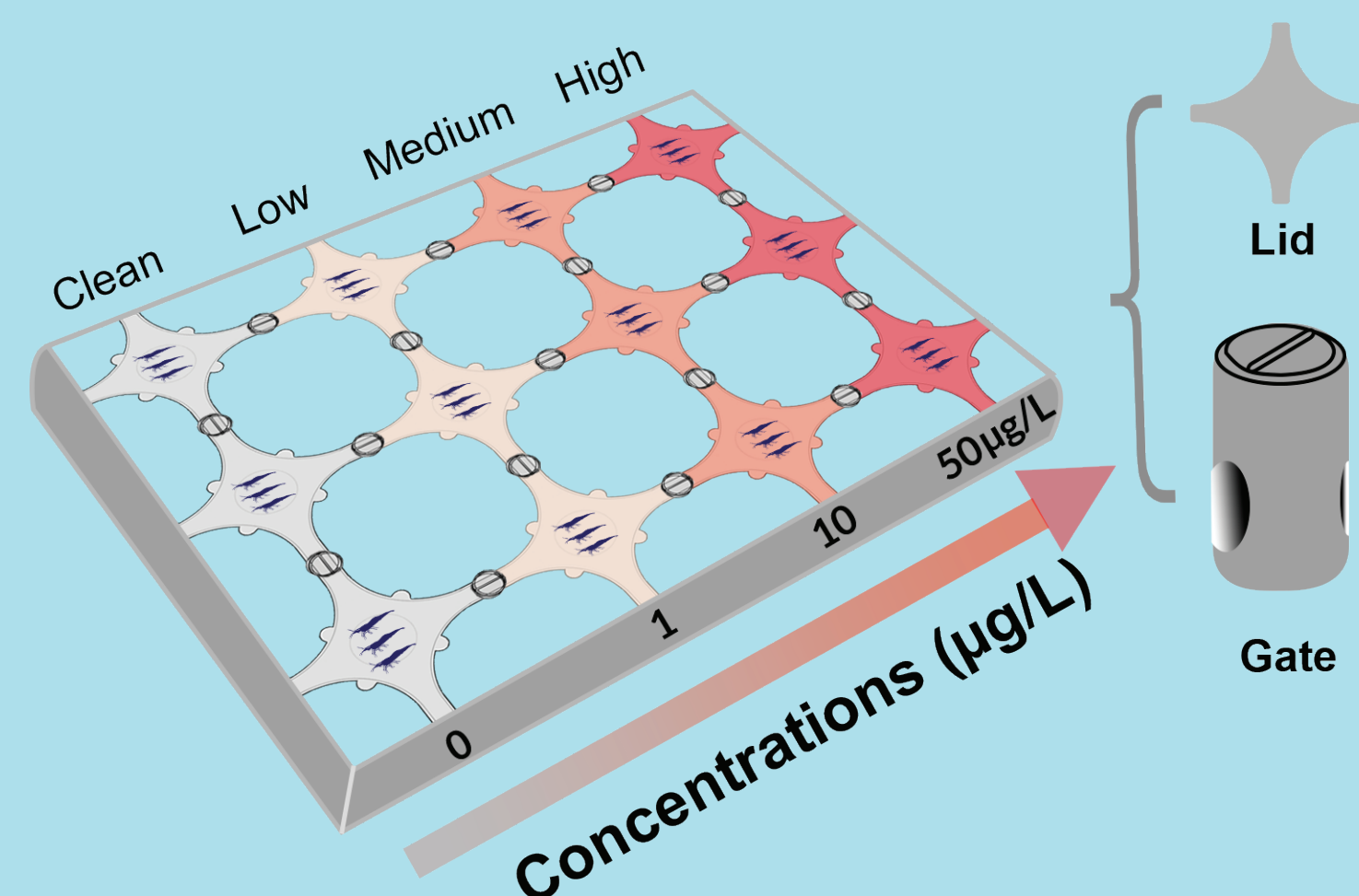
These e-wastes often contain metals, including Rare Earth Elements (REEs) like cerium, erbium, lanthanum, neodymium and other elements as lithium- increasingly used in battery technology- which pose potential risks to ecosystems.

Our study investigates the impact of these elements, both individually and in mixtures, on the avoidance behavior of the aquatic crustacean *Atyaephyra demarestii*, shedding light on potential ecological consequences.

METHODOLOGY

EXPOSURE SYSTEM

- HeMHAS (Heterogeneous Multi-Habitat Assay System)



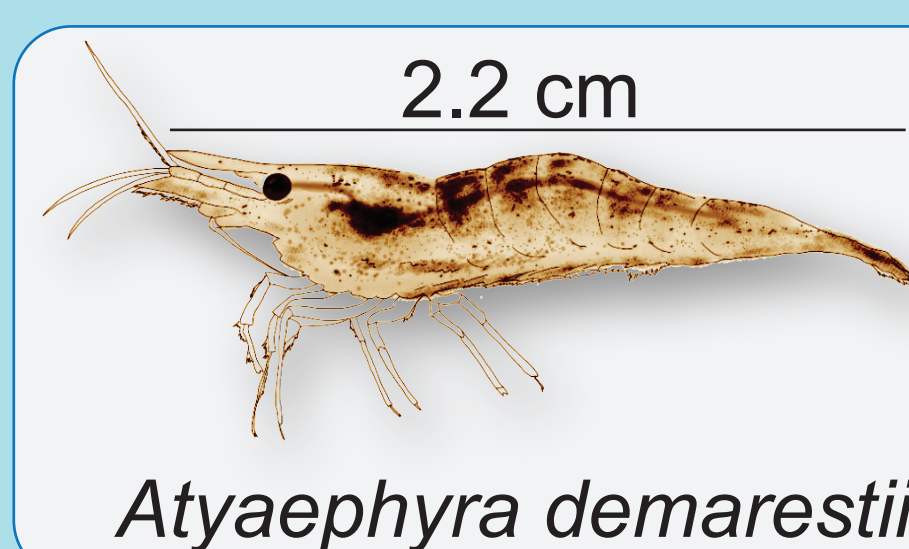
CHEMICALS

- Single exposure: **Ce** (Cerium 140.116), **Er** (Erbium 167.26), **La** (Lanthanum 138.90547), **Li** (Lithium 6.941), **Nd** (Neodymium 144.242)
- Binary mixtures: 50% **Ce** + 50% **La**

CONCENTRATION GRADIENTS

- REE: **Ce**, **Er**, **La**, **Nd**
 - Clean (0 µg/L)
 - Low (1 µg/L)
 - Medium (10 µg/L)
 - High (50 µg/L)
- Li**
 - Clean (0 µg/L)
 - Low (1 µg/L)
 - Medium (10 µg/L)
 - High (200 µg/L)

TEST SPECIES & TREATMENTS



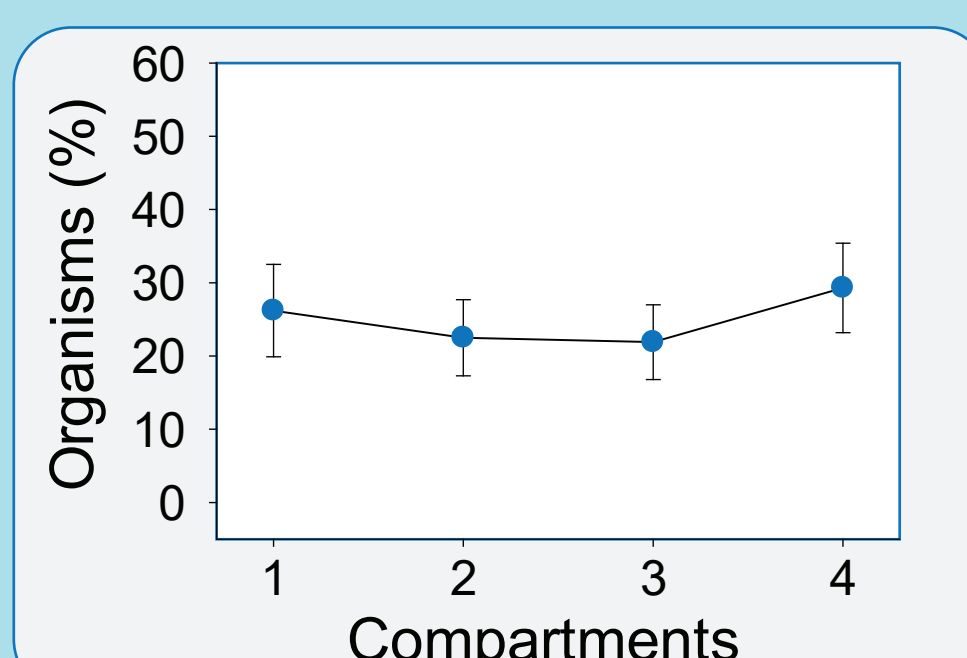
Atyaephyra demarestii

- 4 concentrations
- 3 individuals/treatment
- 3 replicates
- Total: 36 individuals

DATA RECORDINGS

30 minutes intervals for the first 4 h and at the end of the experiments (24 h)

CONTROL EXPERIMENT



CONCLUSION

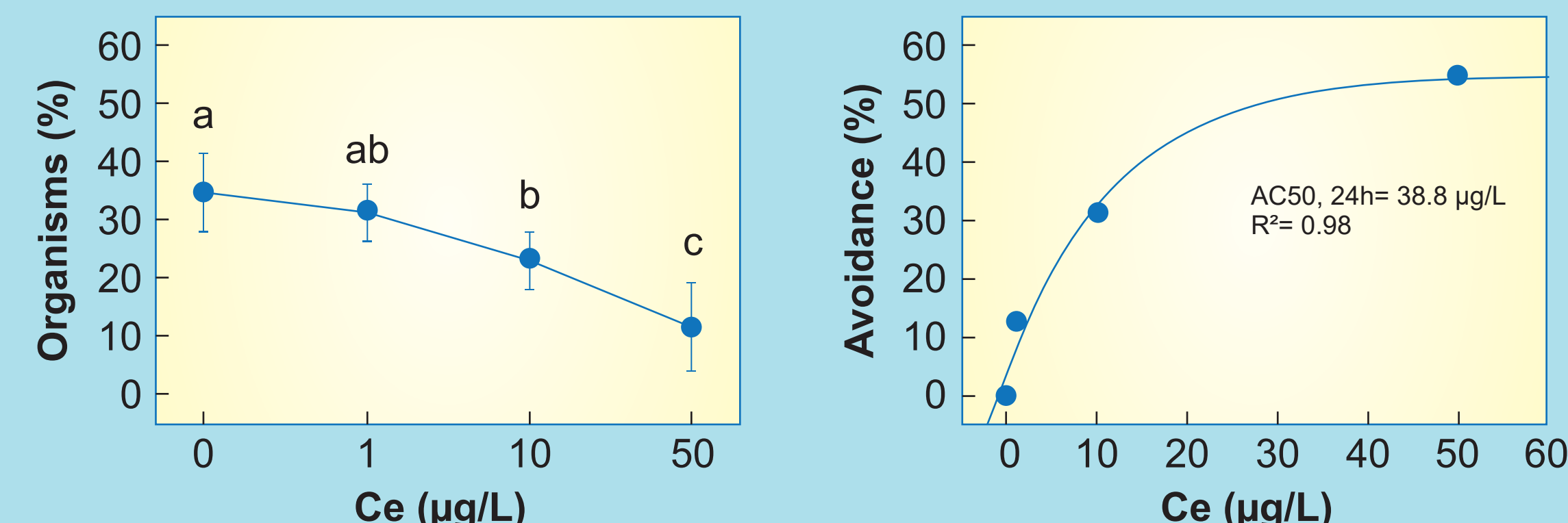
A. desmaresti detected and avoided all tested contaminants in different ways

Among the tested chemicals (single exposure) La was more repellent compared to Er, Li and Nd (based on the AC50 values)

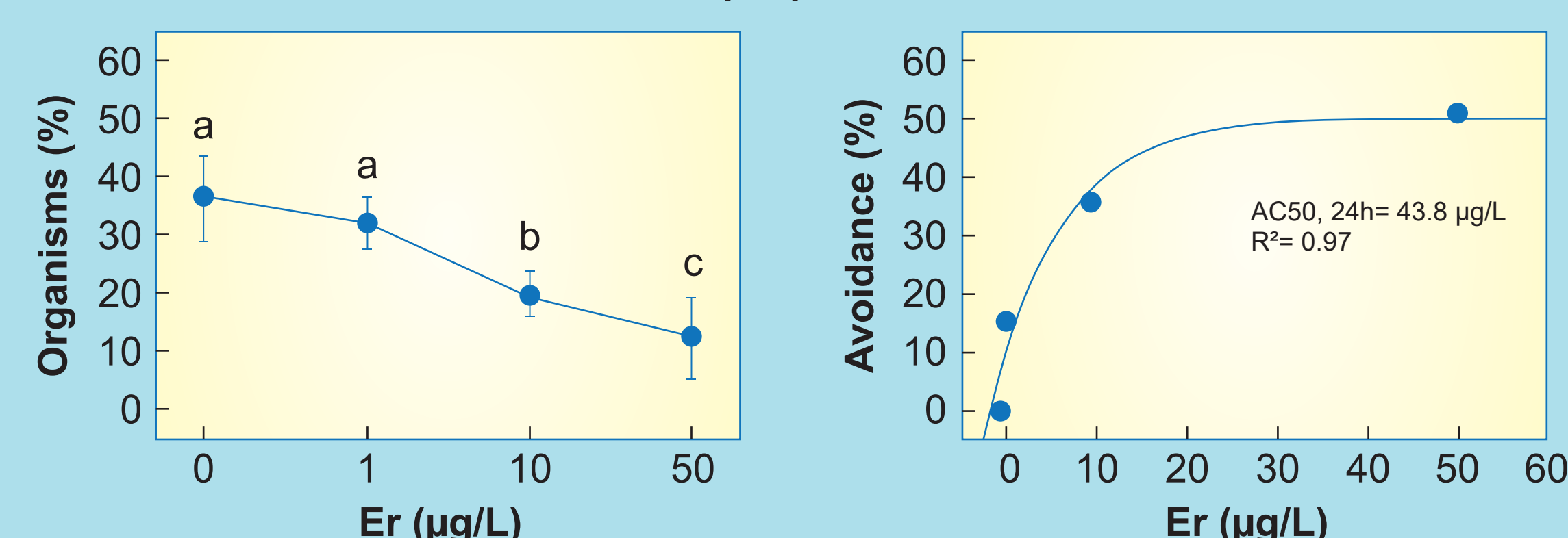
The binary mixture of Ce and La (50%) showed more repelency than the single exposure

RESULTS

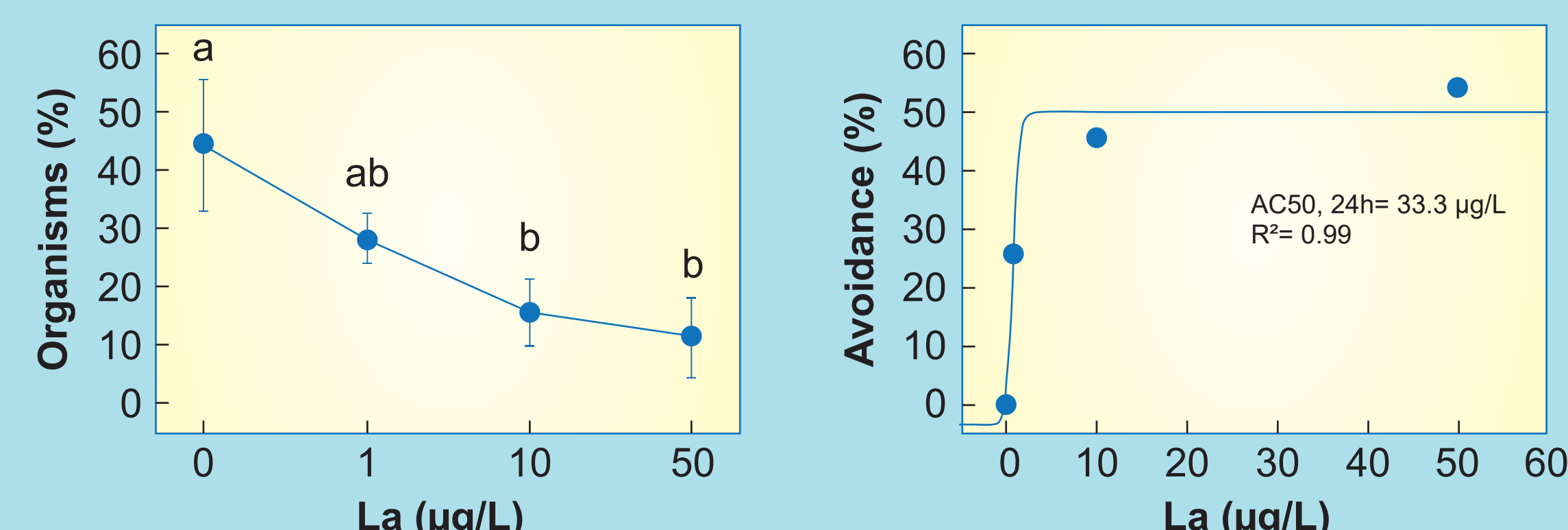
1. Avoidance test with Cerium (Ce)



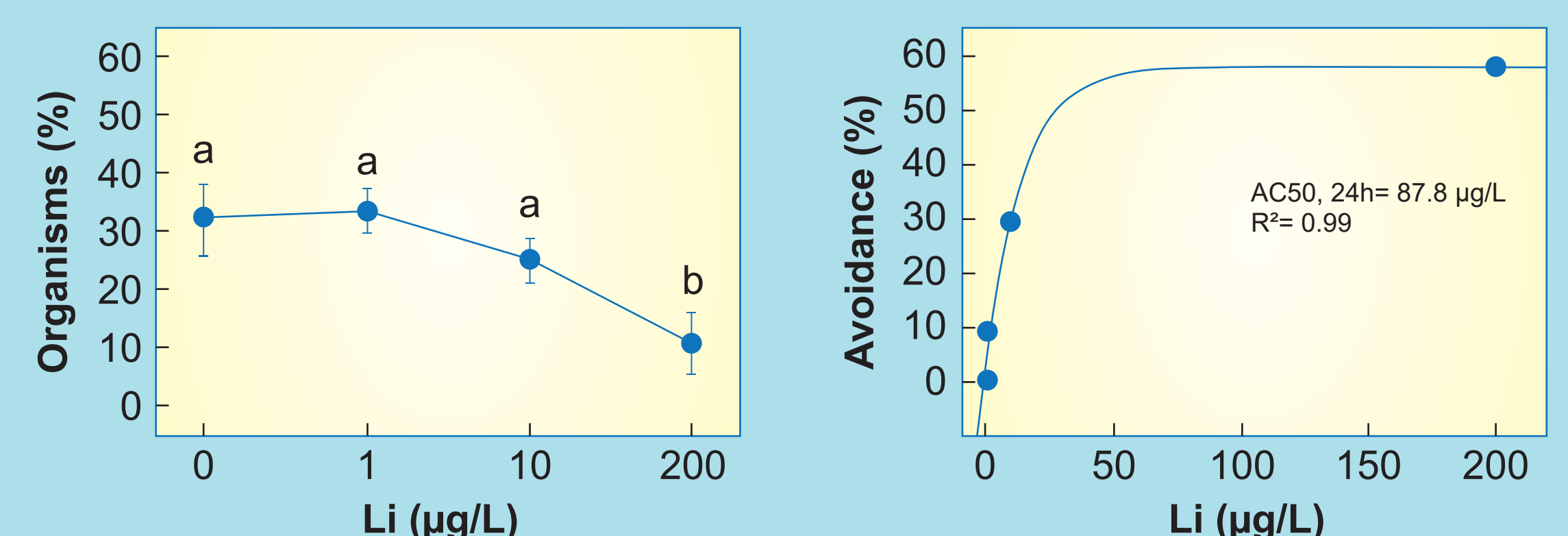
2. Avoidance test with Erbium (Er)



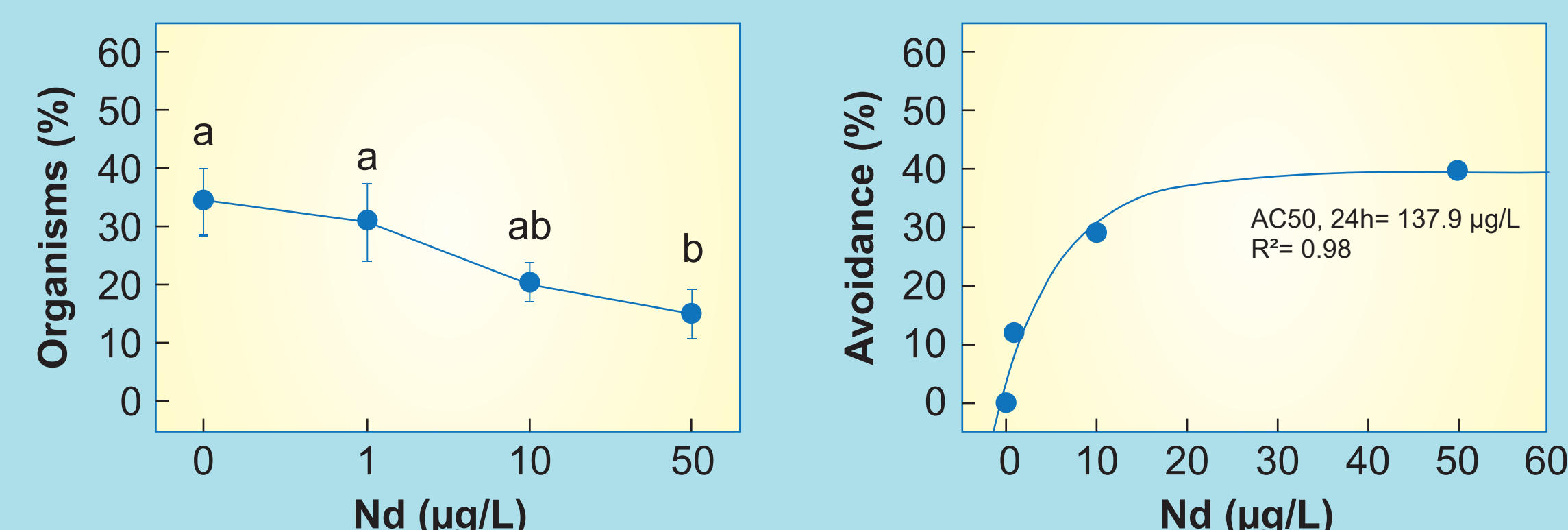
3. Avoidance test with Lanthanum (La)



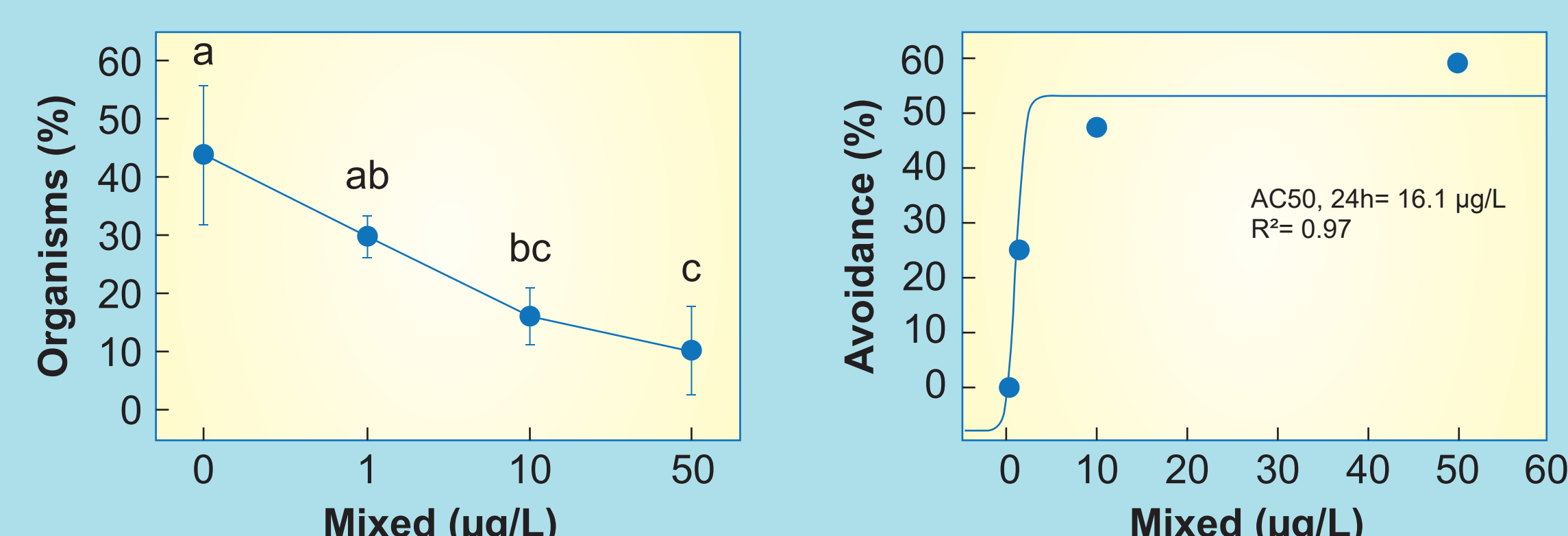
4. Avoidance test with Lithium (Li)



5. Avoidance test with Neodymium (Nd)



6. Avoidance test with binary mixture (Ce and La)



ACKNOWLEDGEMENT

