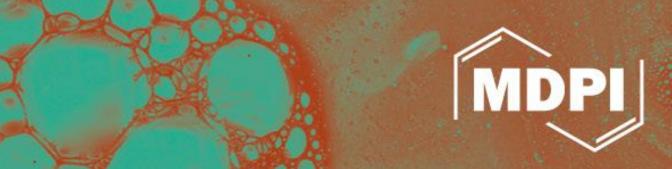


The 3rd International Online Conference on Toxins



10-12 September 2025 | Online



Molecules from marine invertebrate venoms recover cathepsin D activity, impaired by oligomerized Aβ42, in a neuronal cell model of Alzheimer's disease



•Authors: Juliana Guanaes Pina, Alquiandra Stefani Ferreira Mançano, Isabela Monique Fortunato, Juliana Mozer Sciani





CNPq

INTRODUCTION & AIM

- Alzheimer's disease (AD) is characterized by the accumulation of amyloid- β (A β).
- As a result, it disrupts autophagy-lysosomal pathway in neurons, specially cathepsin D.

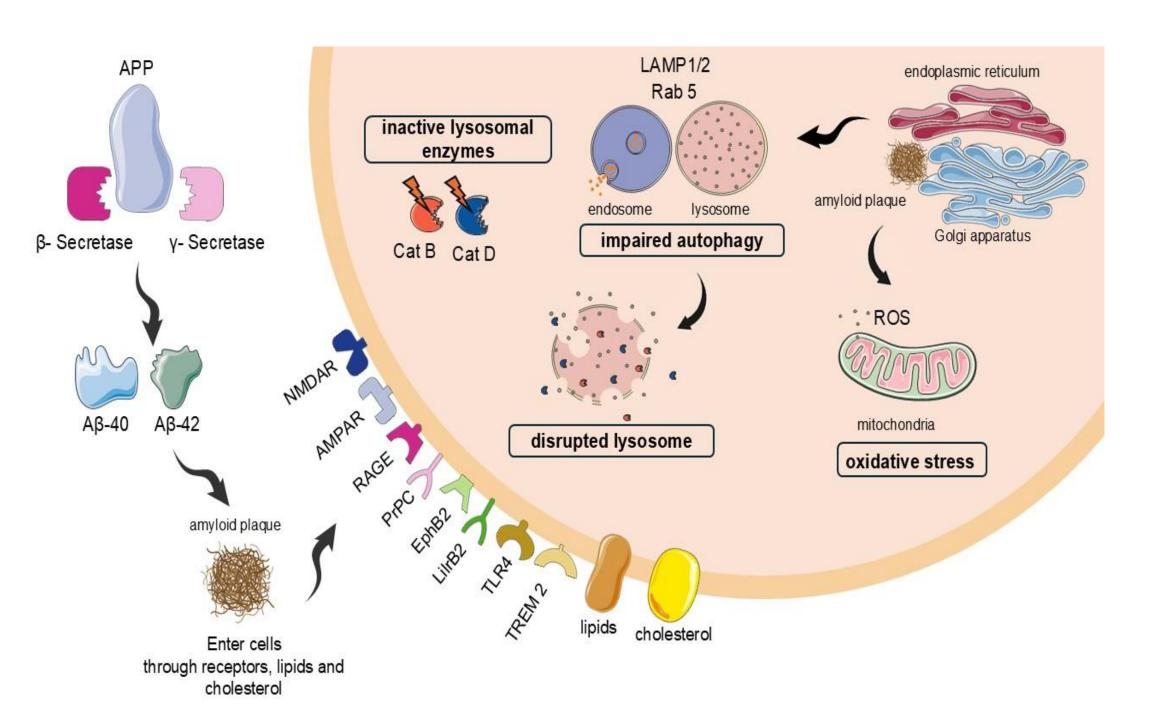


Figure 1: Alzheimer's disease pathology correlate with cathepsin D. Mançano et al., 2024.

METHOD

FROM THE EUROPEAN COLLECTION OF AUTHENTICATED CELL **SH-SY5Y CELLS** CULTURES (ECACC) PRE-TREATED (48 HOURS): AB (OAB) • 6 MARINE INVERTEBRATE TREATMENT WITH MARINE EXTRACTS (24 HOURS) SPECIES COLLECTED IN SÃO SEBASTIÃO, BRAZIL FLUORESCENCE SUBSTRACT: MEASURED CATHEPSIN D ACTIVITY BY GKPILFFRLK(DNP)-D-R-NH2-MCA FLUORESCENCE INTENSITY MONITORED EVERY 10 MINUTOS. • ΛΕΧ =: 405 NM, ΛΕΜ: 495 NM

Figure 2: Methodology for cathepsin D enzymatic activity evaluation.

RESULTS & DISCUSSION

• oAβ treatment decreased cathepsin D activity, measured by its velocity in AUF/min, by 40%compared to control (cells without treatment).

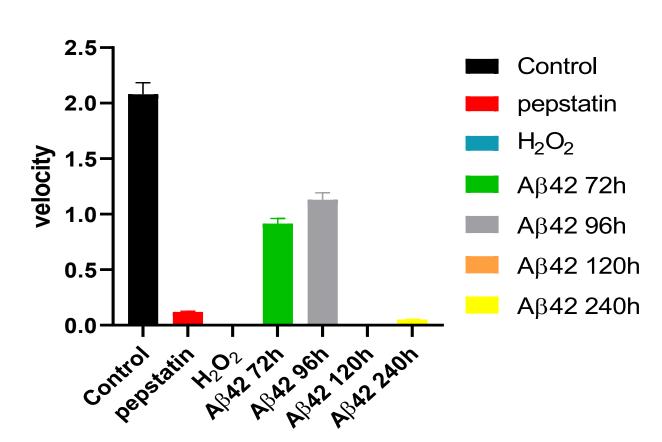


Figure 3: Velocity of reaction of cathepsin D from SH-SY5Y cells over synthetic substract. Control= cells without treatment.

• Venoms from the corals *Renilla reniformis* and *Tubastraea* tagusensis, sea anemone *Anthopleura cascaia* and sea urchin *Echinometra lucunter* are recovered the cathepsin D activity.

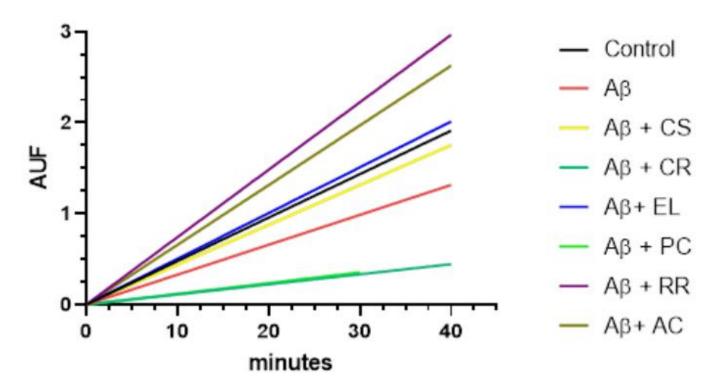


Figure 4: Cathepsin D enzymatic activity of six marine extracts, shown as arbitrary units of fluorescence (AUF) over time (minutes). Control= cells without treatment.

CONCLUSION

- The findigns demonstrated a reduction or inhibition of cathepsin D enzymatic activity in neurons exposed to the oligomerized Aß peptide.
- Marine-derived molecules may hold a therapeutic candidates for restoring lysossomal function.

FUTURE WORK / REFERENCES

• It's interesting to analyze the *A. cascaia* fractions, which exhibited the most intense activity, with the objective to identify the fraction of the molecule that presents the best answer.