

# DEVELOPMENT OF BIOACTIVE MOLECULES FOR THE TREATMENT OF ALZHEIMER'S DISEASE

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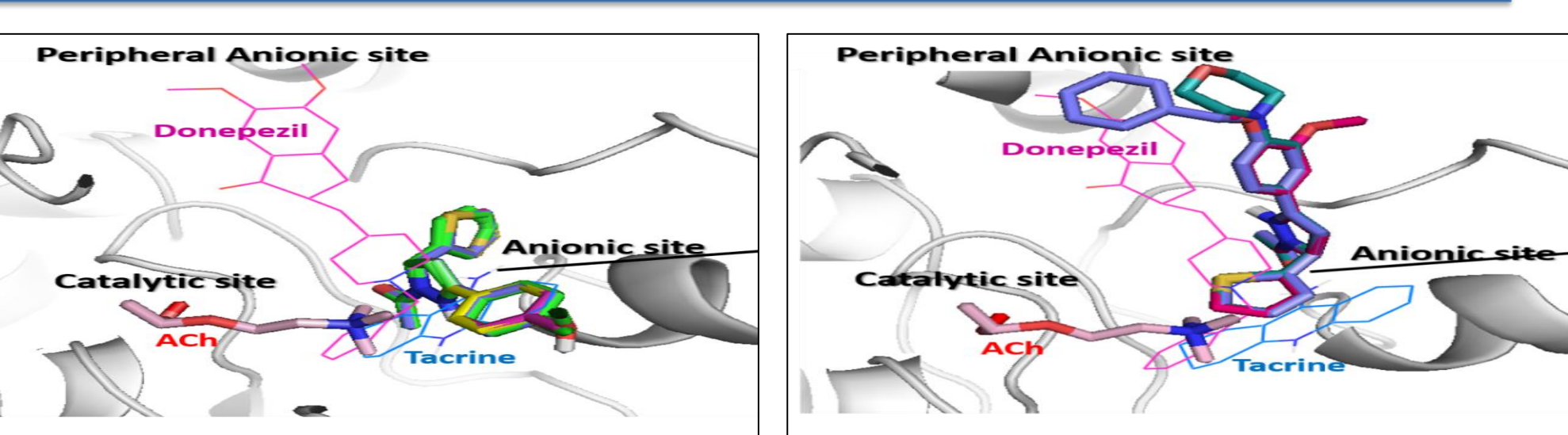
## INTRODUCTION

Alzheimer's disease → progressive brain disease → wreaks havoc on memory and thinking skills, capacity to carry out even the most basic tasks. AD → the most common dementia subtype, accounting for nearly 70% of all dementias. Current drugs → Provide symptomatic treatment. These therapies show only a little, but consistent, improvement in cognitive and functional ability. Prolonged use → Cause side effects. The understanding of the multifactorial hypothesis of Alzheimer's disease and the possibility of utilizing a multi-target approach provides promise for the development of new and effective treatments for the disease.

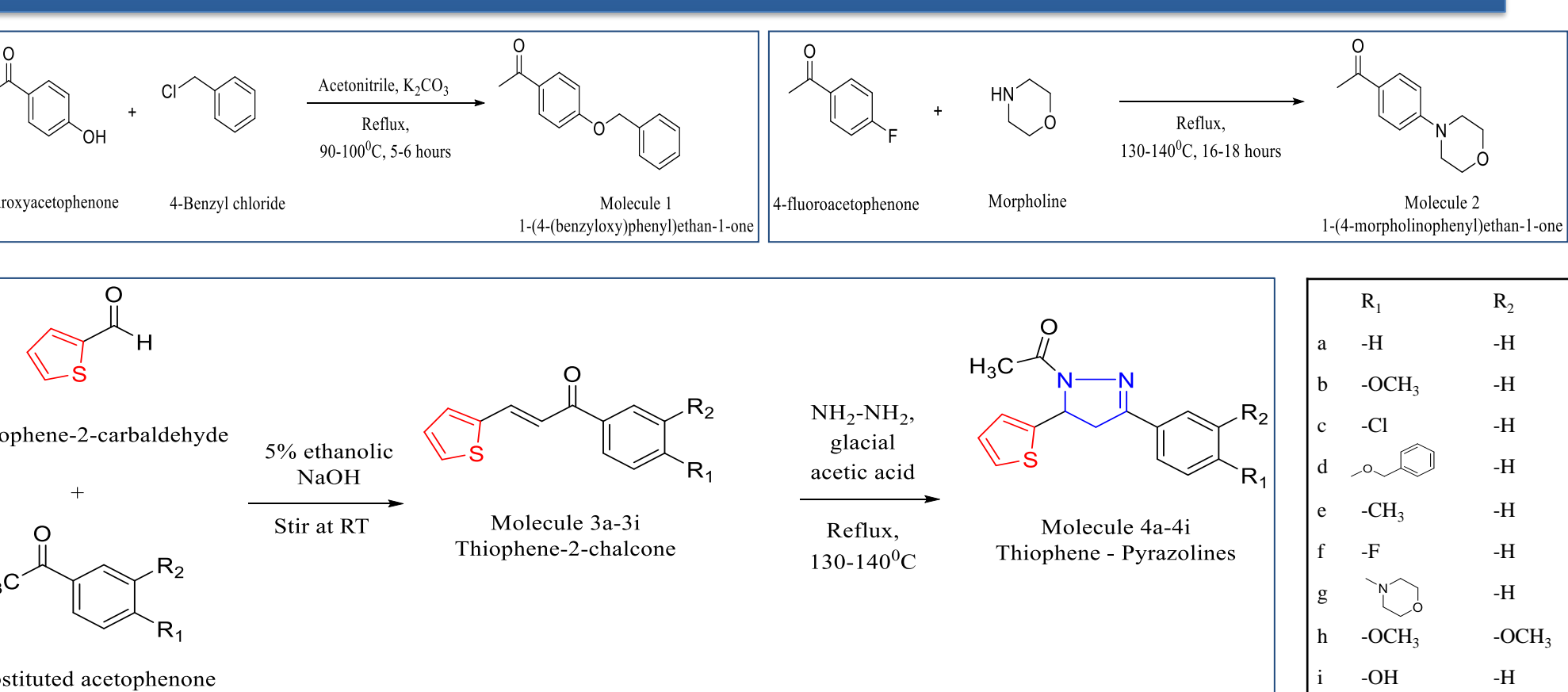
## RATIONALE

Develop a series of thiophene-pyrazoline compounds with potential to address the various causative biochemical events that cause Alzheimer's disease.

## DOCKING BASED DESIGNING

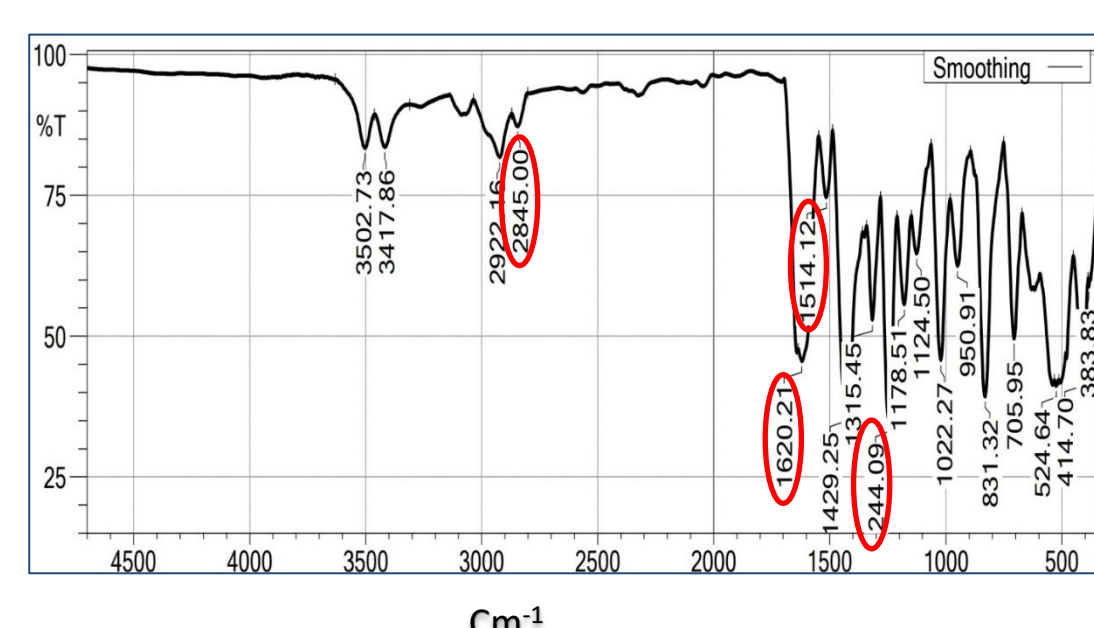
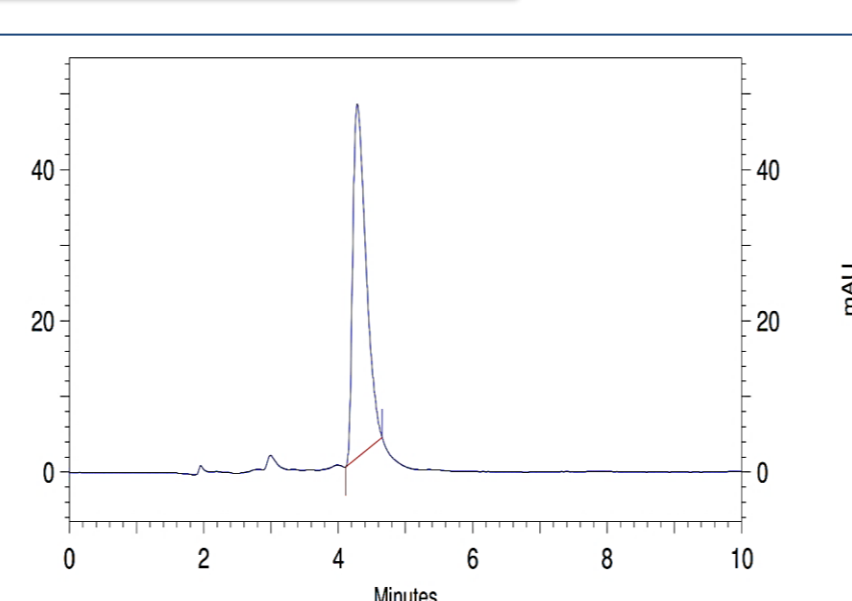


## SYNTHESIS SCHEME

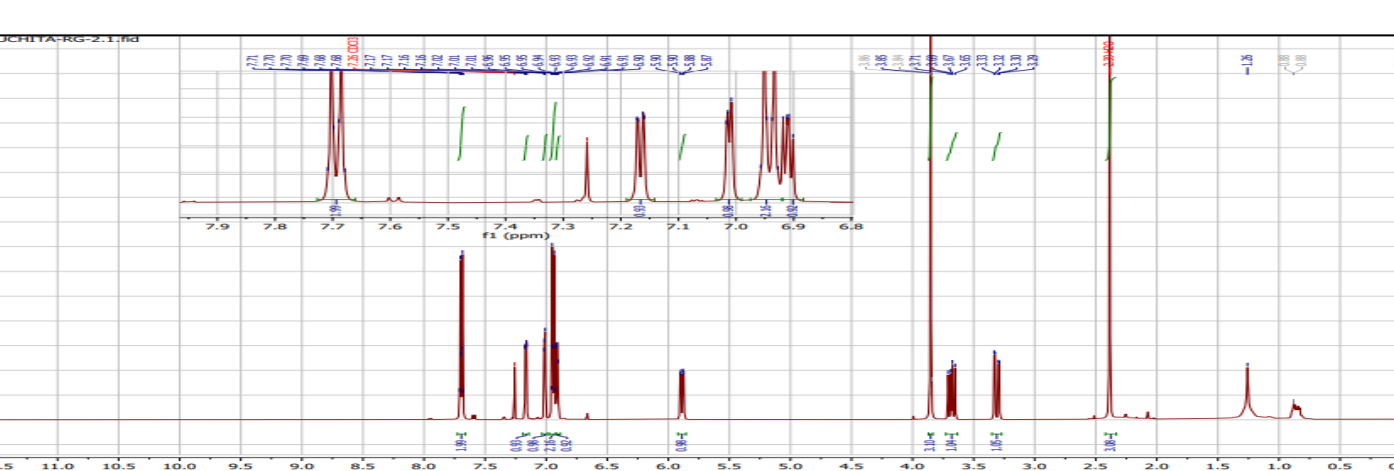


## HPLC

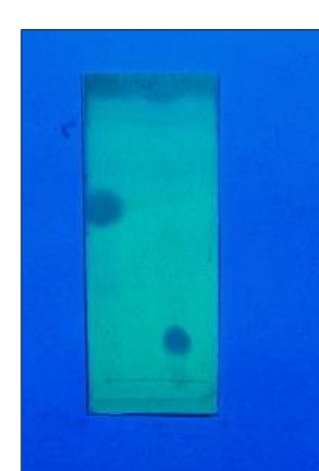
## FTIR



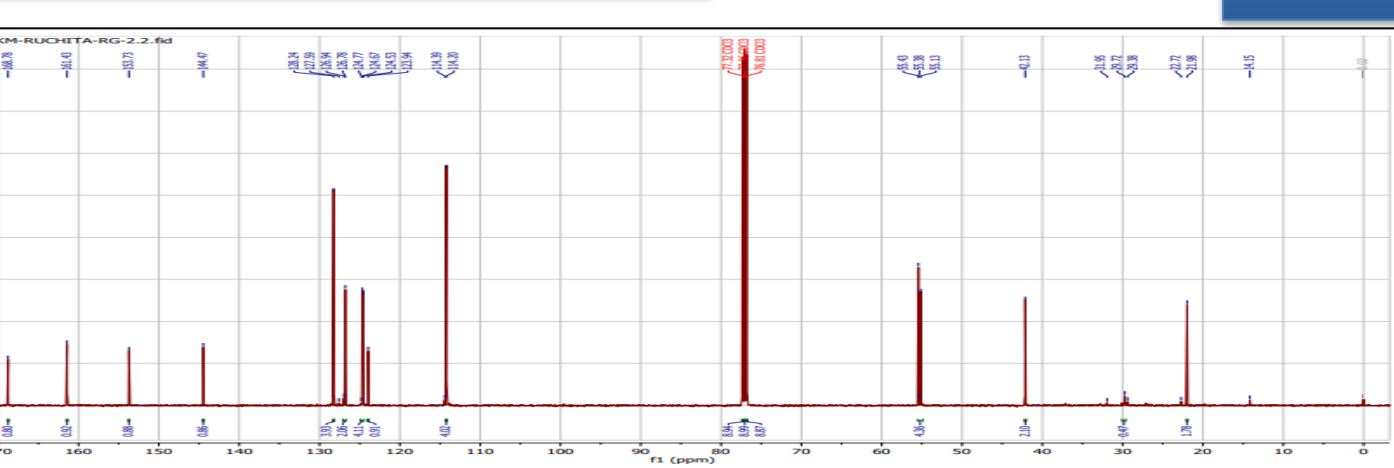
## 1H NMR



## TLC



## 13C NMR



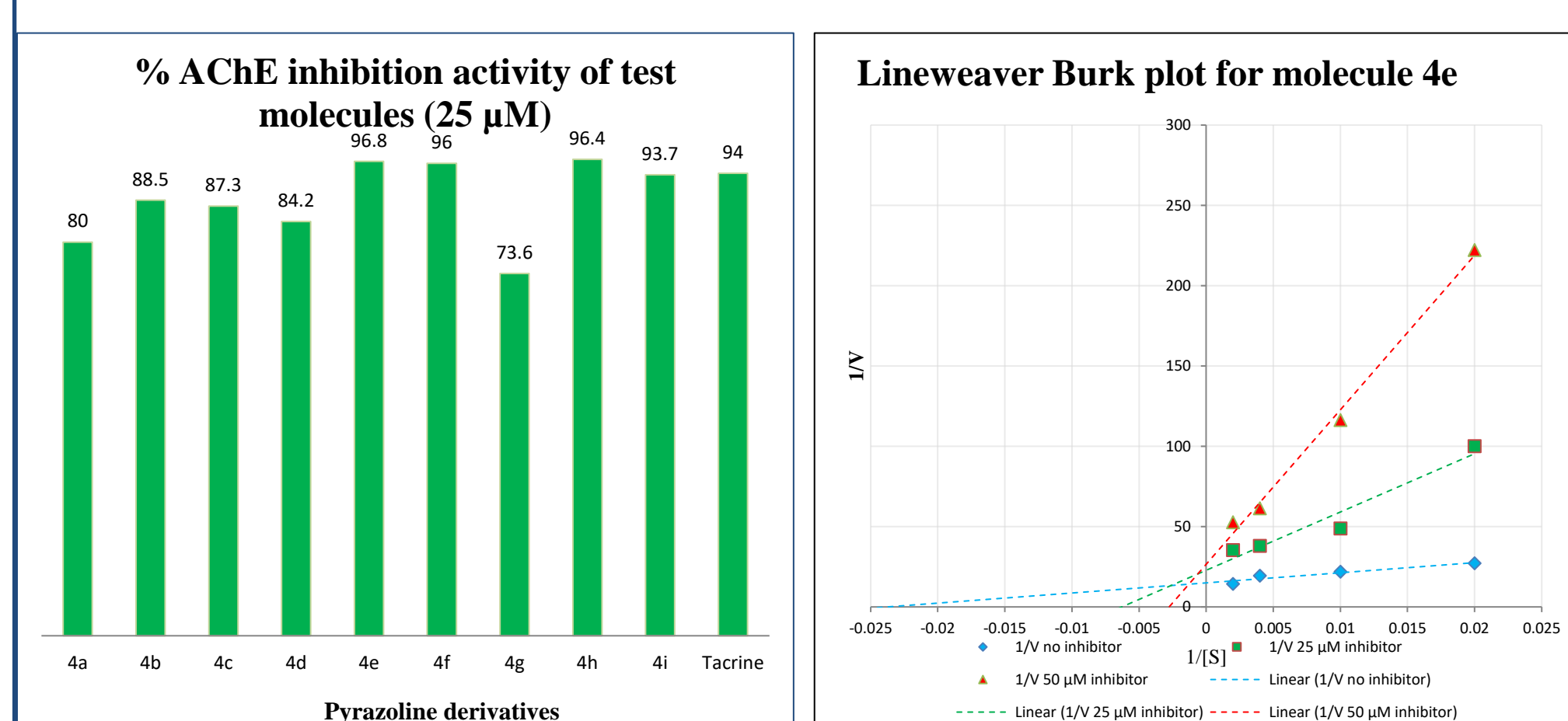
## SOLUBILITY



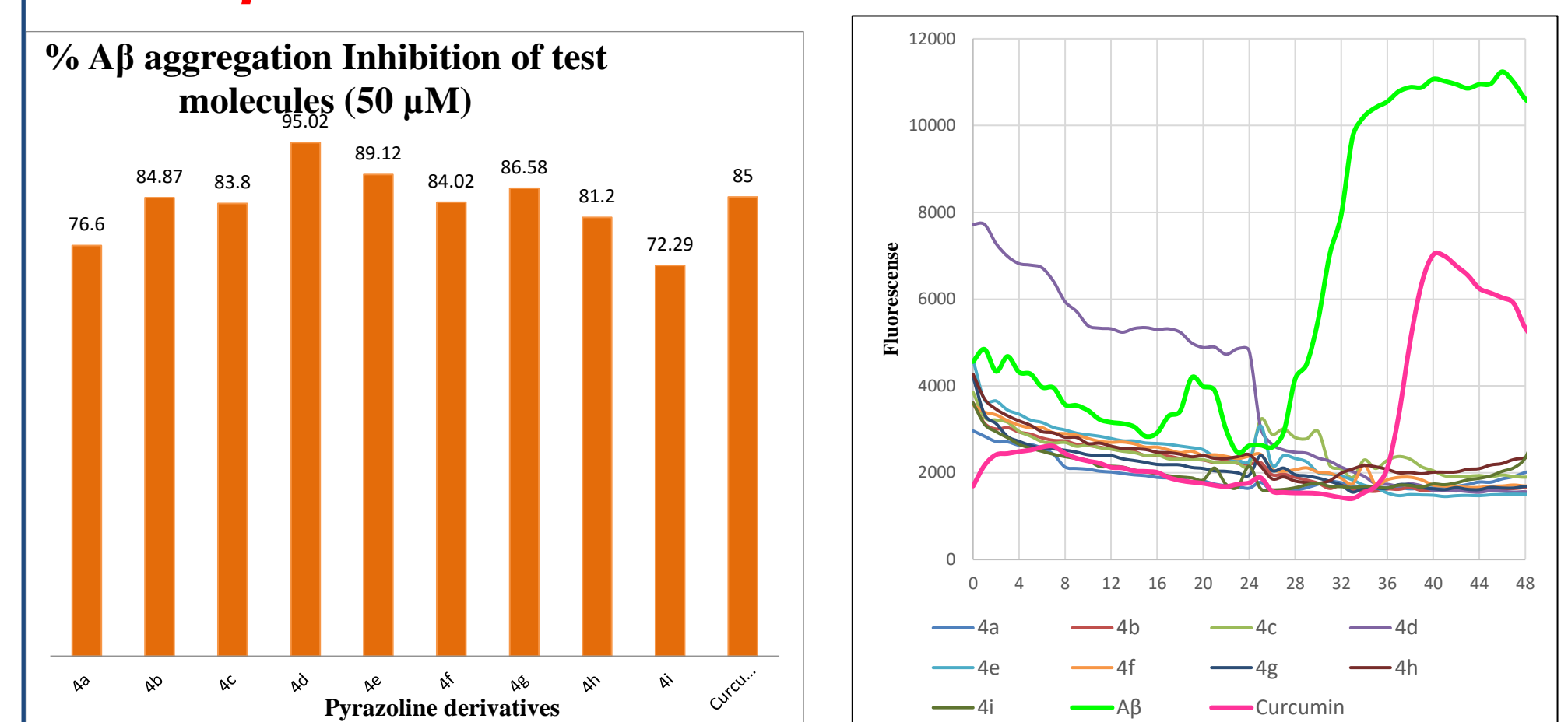
## REFERENCES

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- Eratne D, Loi SM, Farrand S, Kelso W, Velakoulis D, Looi JCL. Alzheimer's disease: clinical update on epidemiology, pathophysiology and diagnosis. *Australas Psychiatry*. 2018;26(4).
- Livingston G, Huntley J, Sommerlad A, Ames D, Ballard C, Banerjee S, et al. Dementia prevention, intervention, and care: 2020 report of the Lancet Commission. *Vol. 396, The Lancet*. 2020.

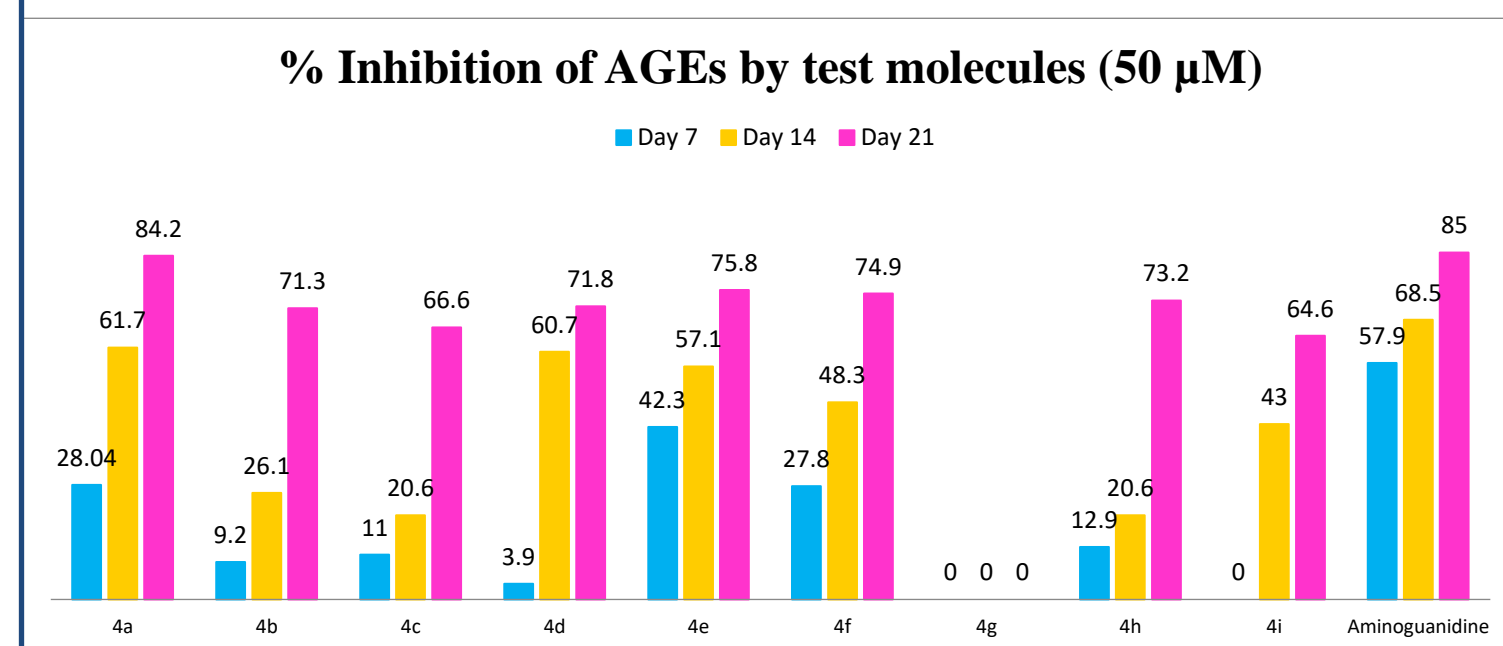
## ACHe INHIBITION ACTIVITY



## Aβ AGGREGATION INHIBITION ACTIVITY

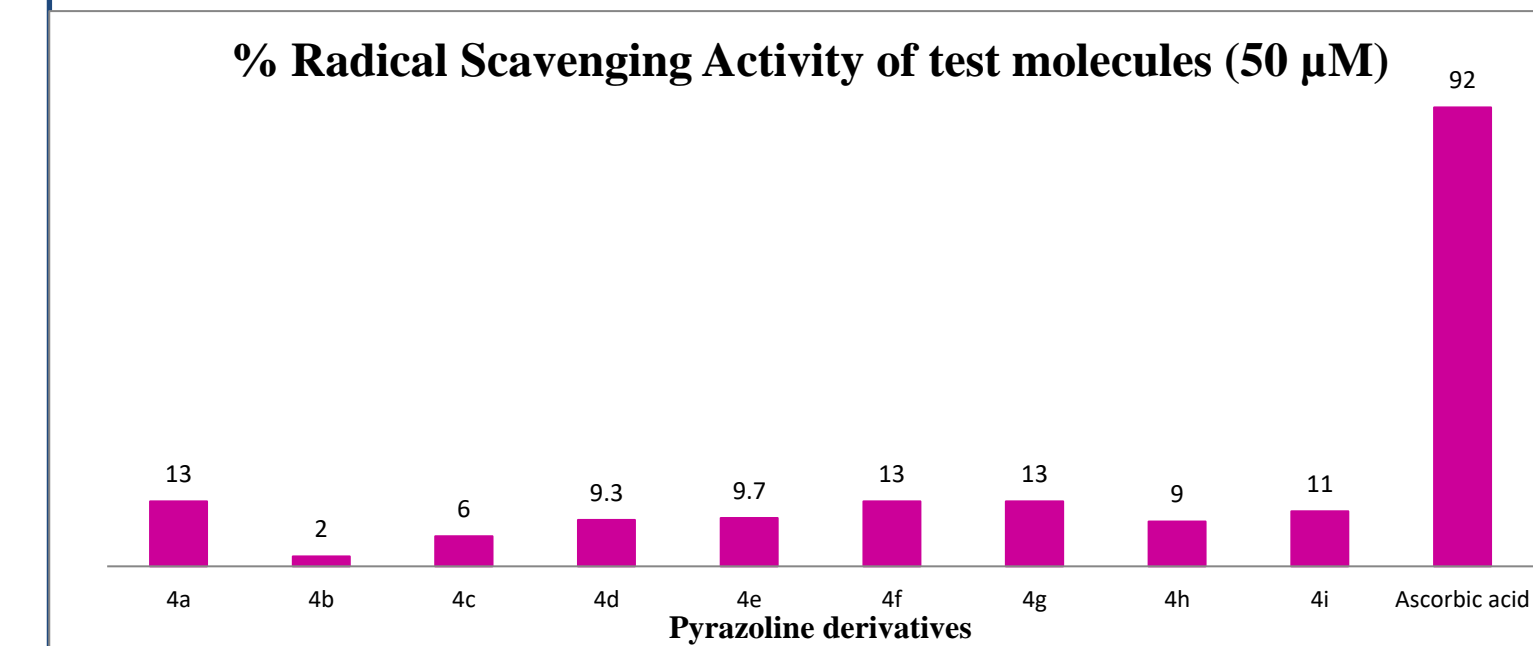


## AGE INHIBITION ACTIVITY

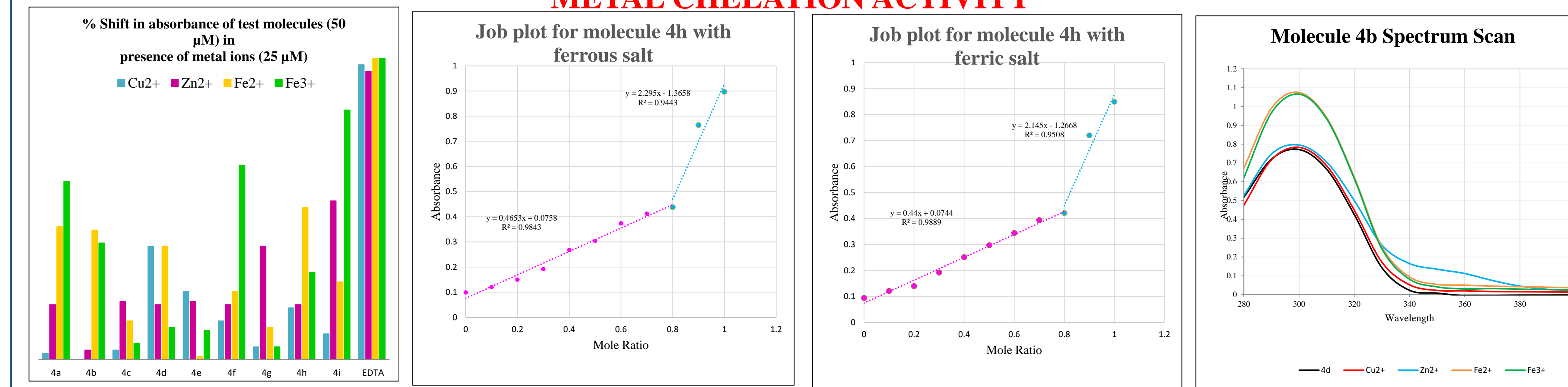


## EFFICACY TESTING FOR VARIOUS TARGETS IN AD

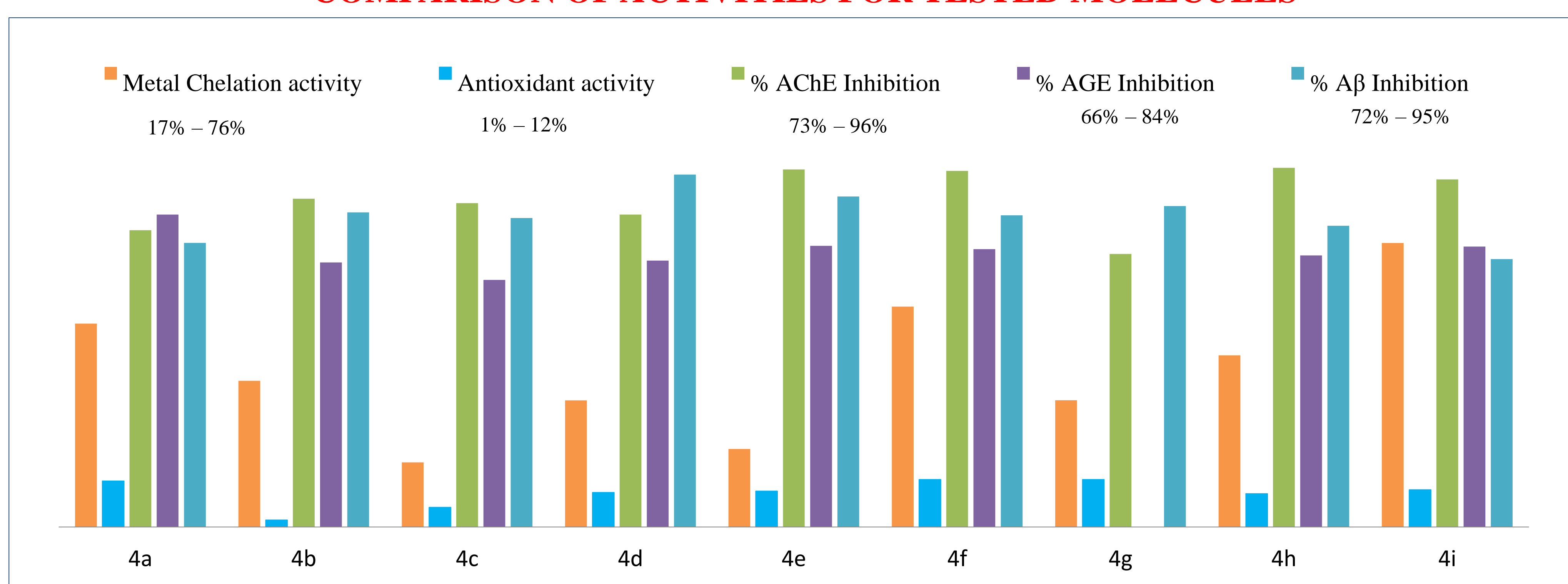
## ANTIOXIDANT ACTIVITY



## METAL CHELATION ACTIVITY



## COMPARISON OF ACTIVITIES FOR TESTED MOLECULES



## CONCLUSION

While the antioxidant activities of the synthesized thiophene pyrazoline molecules needs further optimization, the series as such showed excellent potential in mitigating the multiple causative factors implicated in Alzheimer's disease viz Aβ aggregation inhibition, AChE inhibition, metal chelation and inhibition of advanced glycation end-products.

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