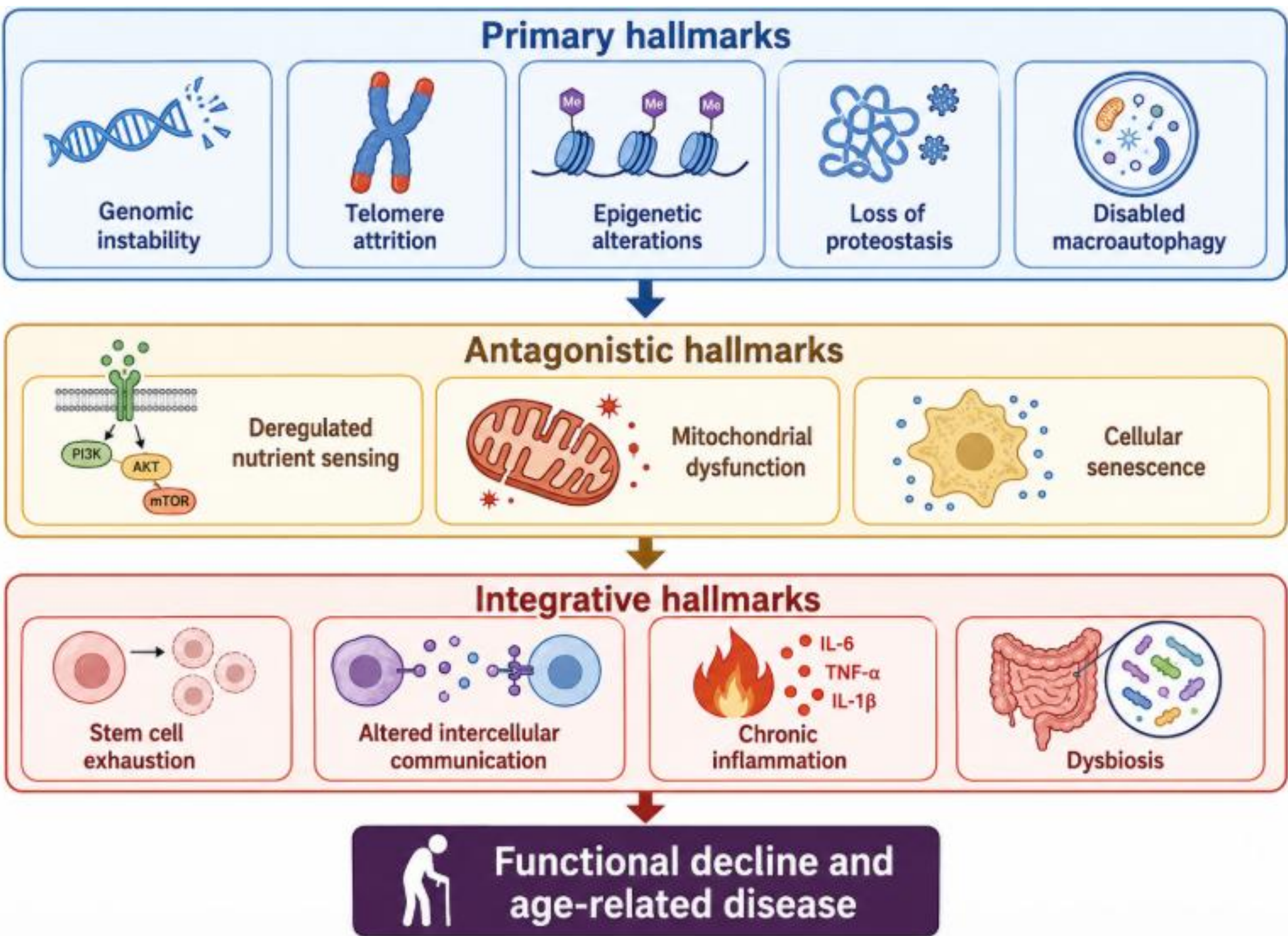


Efficient Systemic Antioxidant Responses Associated With Cognitive Preservation: Insights In Admixed Centenarian Women

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INTRODUCTION

Aging is a complex biological process characterized by the progressive accumulation of cellular and molecular damage.



Extreme ages → defense mechanisms → homeostasis and cognitive maintenance

METHODS

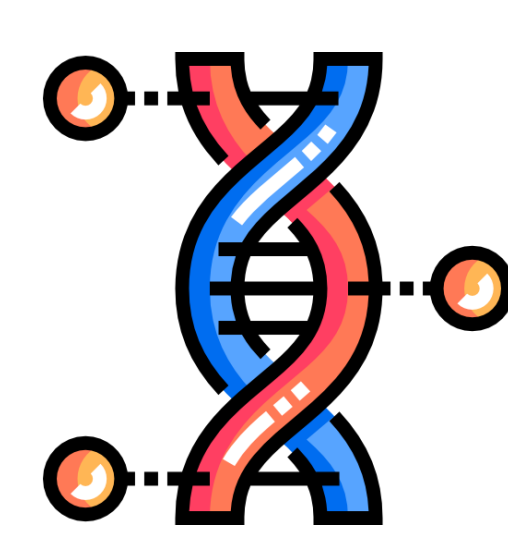


Women from different age groups (N=3/group or subgroup):

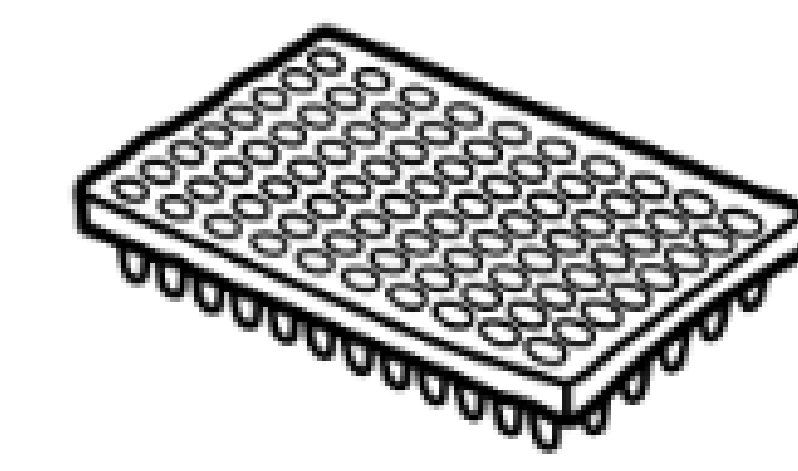
- Adults (30-40 yo);
- Older adults (less than 60 years old),
- Centenarians:
 - cognitively health
 - presumed diagnosis of Alzheimer’s Disease (AD)

Research Ethics Committee (REC).
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Whole-genome sequencing (WGS)



Plasma total antioxidant capacity (TAC)



ACKNOWLEDGEMENT

RESULTS

Plasma total antioxidant capacity (TAC) assay

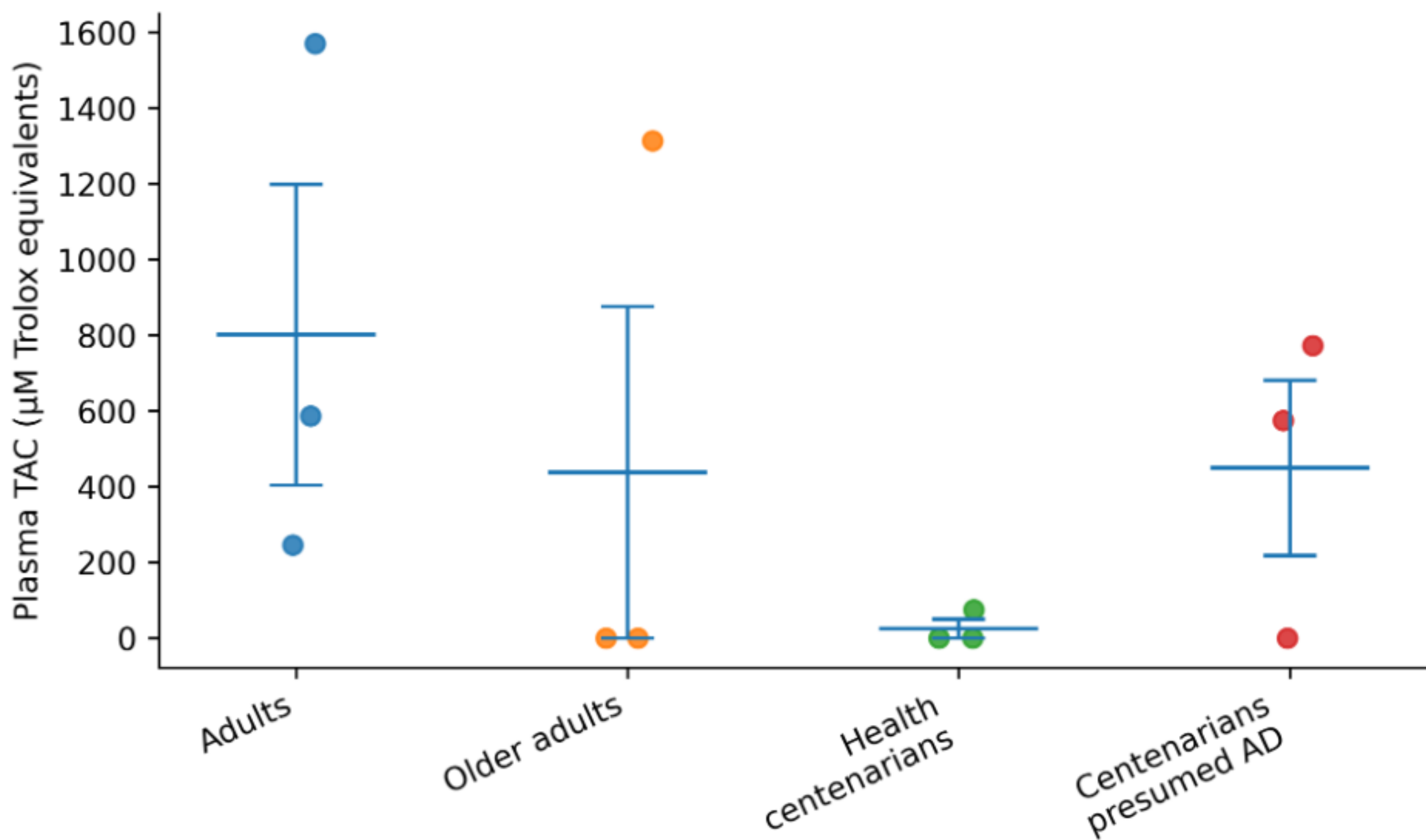


Figure 1. Plasma total antioxidant capacity across age and cognitive groups. Plasma total antioxidant capacity (TAC) was quantified using a Trolox-equivalent colorimetric assay and calculated from donor-level technical replicate means. Each point represents one participant. Empty wells were excluded from the analysis, and negative calculated values were considered below the assay floor and plotted as zero. Data are shown as individual donor means with group mean ± SEM. Centenarians with presumed AD showed higher plasma TAC than healthy centenarians, suggesting a possible compensatory systemic antioxidant response associated with cognitive vulnerability in extreme aging.

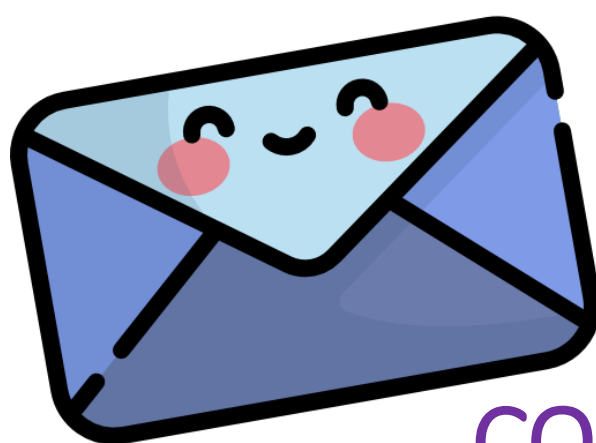
WGS analysis

Volunteer ID	Group	APOE isoform
CH01	Cognitively healthy centenarians	ε2 ε3
CH02		ε3 ε3
CH03		ε3 ε3
AD01	Presumed diagnosis of Alzheimer's Disease (AD)	ε3 ε3
AD02		ε2 ε3
AD03		ε3 ε3

CONCLUSIONS

The relatively higher TAC observed in centenarians AD suggests the activation of systemic compensatory mechanisms, suggesting a late adaptive response or a state of redox dysregulation in which increased plasma antioxidant capacity is insufficient to prevent neuronal damage. Cognitive decline in centenarians may be associated with distinct systemic antioxidant responses, within a genetically admixed population and independent of classical APOE ε4-associated risk.

REFERENCES



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