

Effects of moderate beer intake on the age-associated cognitive and motor impairment: alcoholic fraction interaction and gender differences

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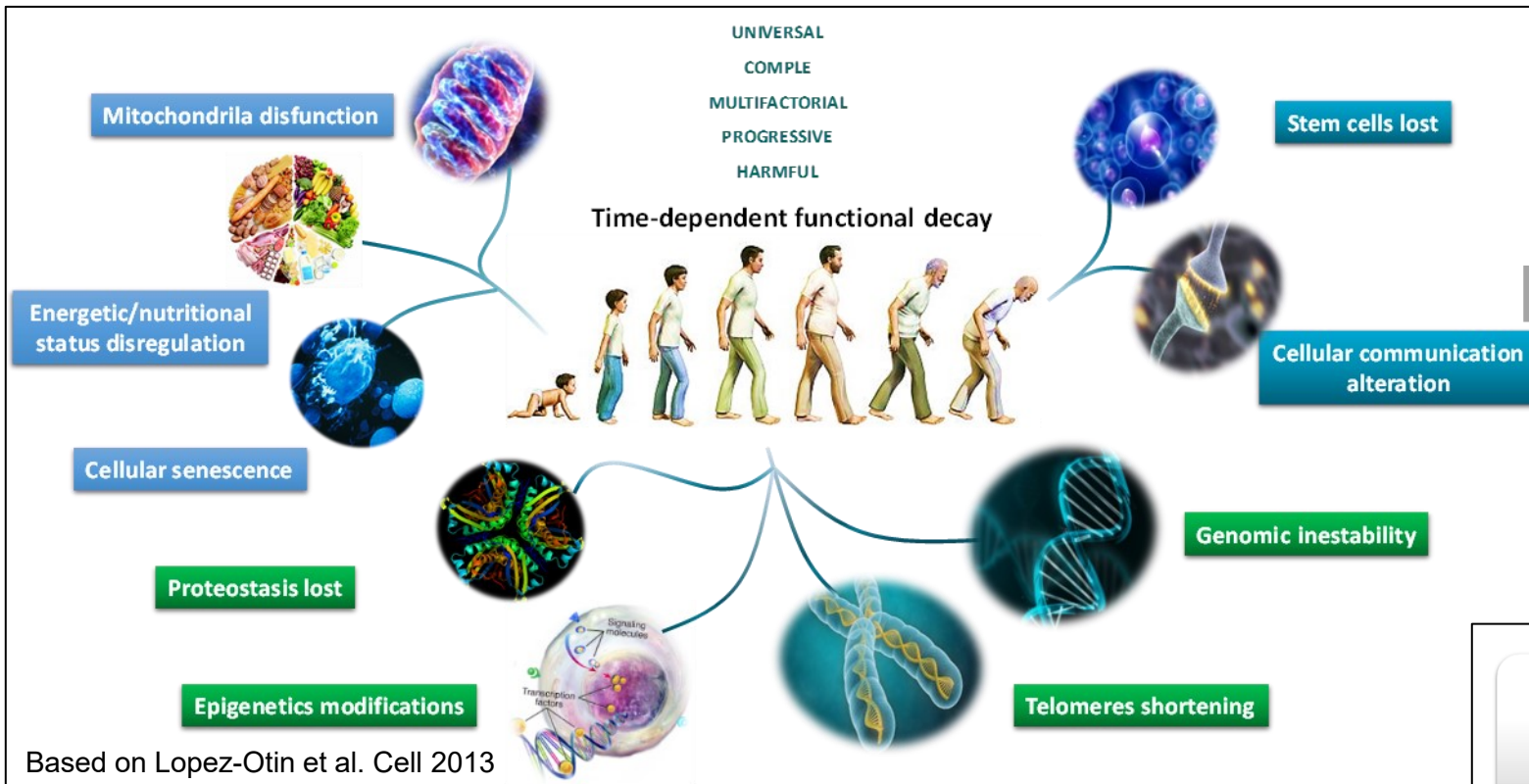
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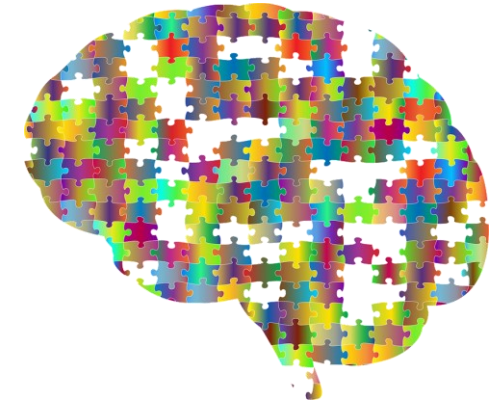
Universitat
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Departament
de Biologia

Age-associated cognitive function decline



Neuroinflammatory environment in brain

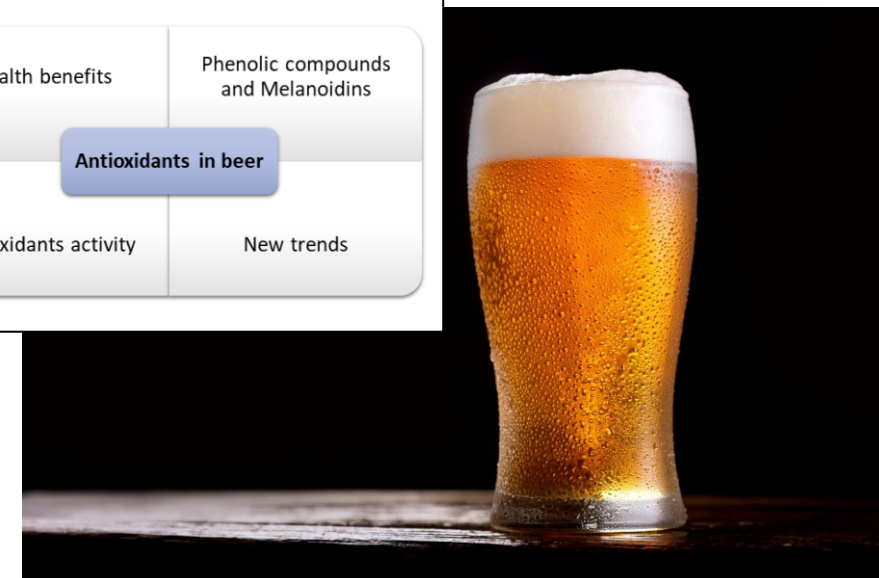
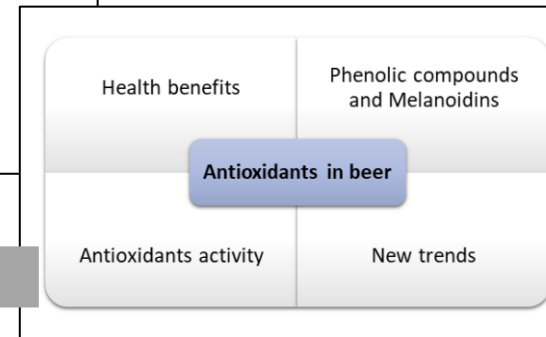


Martínez-Gomez et al. Biomolecules 2020

Potential health effect on brain but interaction with alcoholic fraction

Objective:

Analyze the effect of moderate beer intake on the age-associated cognitive decline, focusing on alcoholic fraction and possible gender differences



EXPERIMENTAL DESIGN

Drunk an human equivalent dose of 2 beer/day for a 70 Kg weight adult

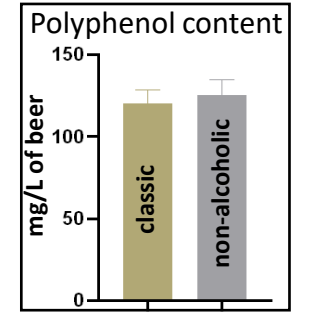
Old Wistar rats 15 months-old



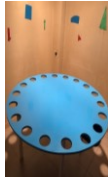
4,8%
1%
1%
alcohol

+4,8% ethanol

- Control
- Classic beer
- Non-alcoholic beer
- Non-alcoholic beer with ethanol added

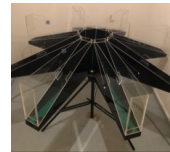


Barnes test



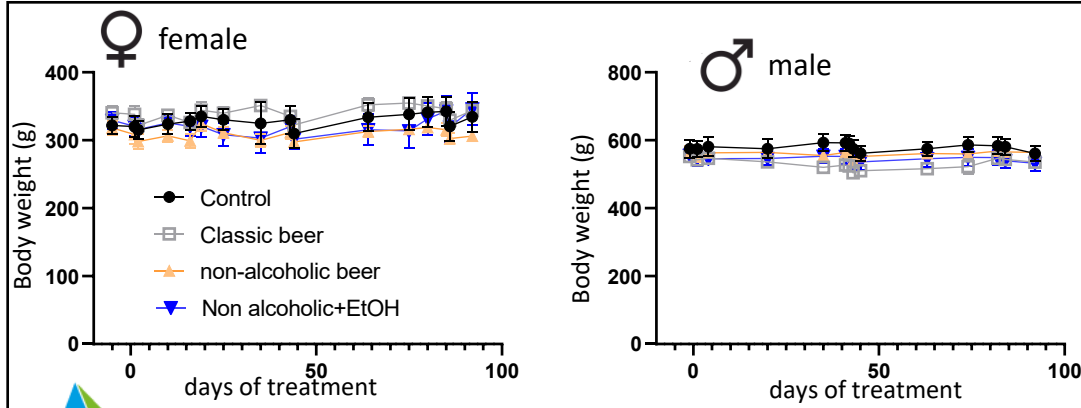
CONDUCTUAL AND MOTOR TESTS

8-arms radial maze

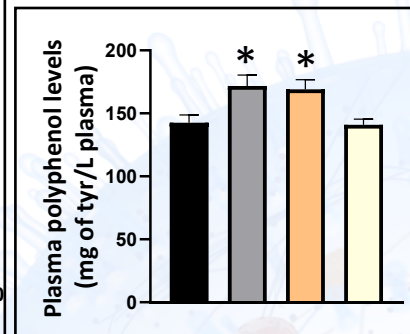
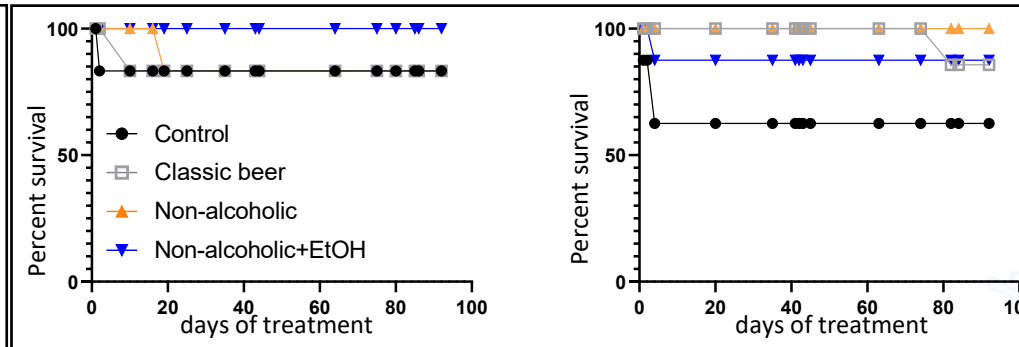


Rota-rod

Body weight evolution



Survival rate

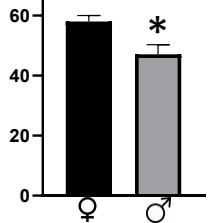


Cognitive test results

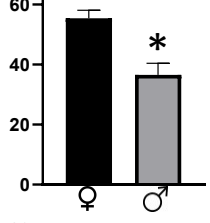
Barnes test results (learning based on spatial memory)



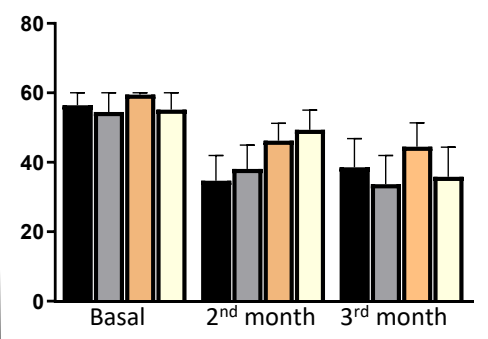
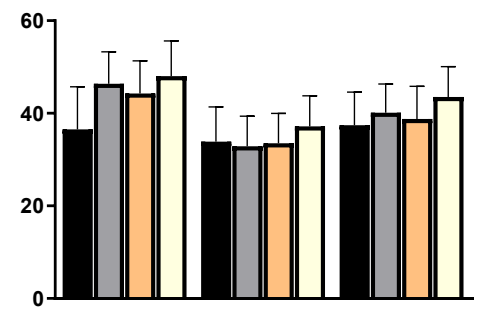
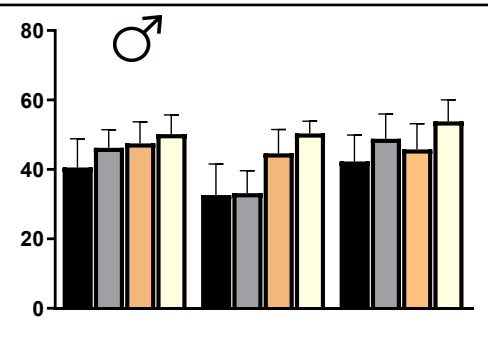
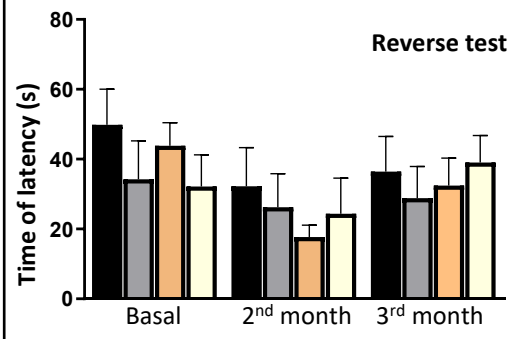
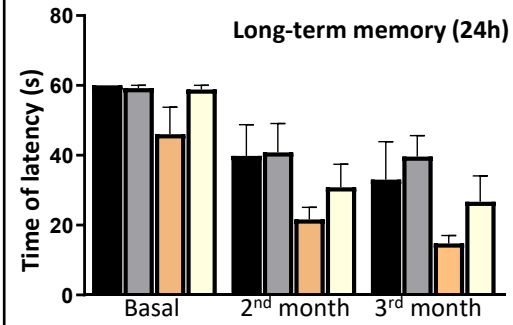
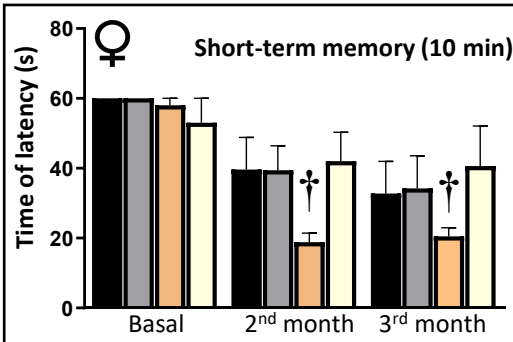
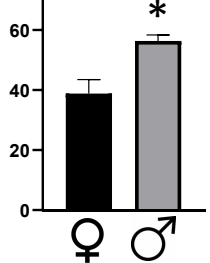
Short-term memory (10 min)



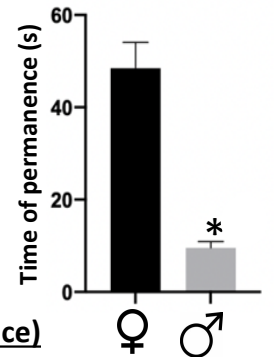
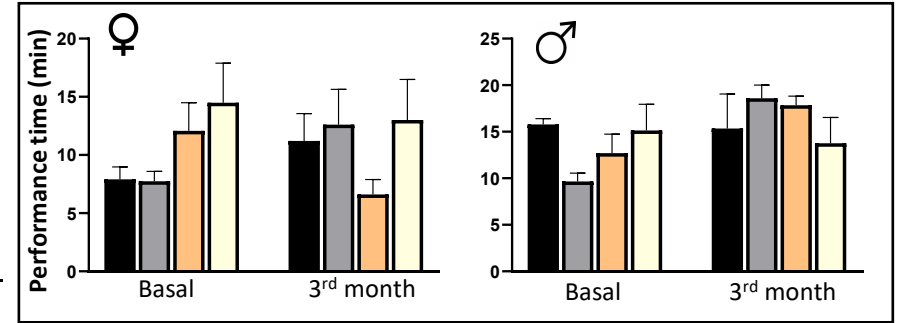
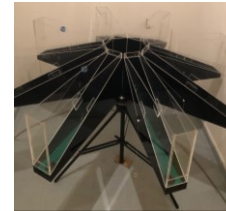
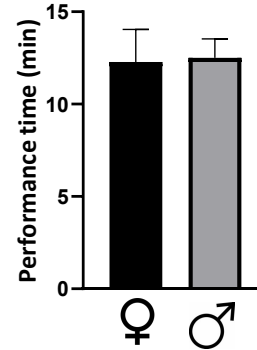
Long-term memory (24h)



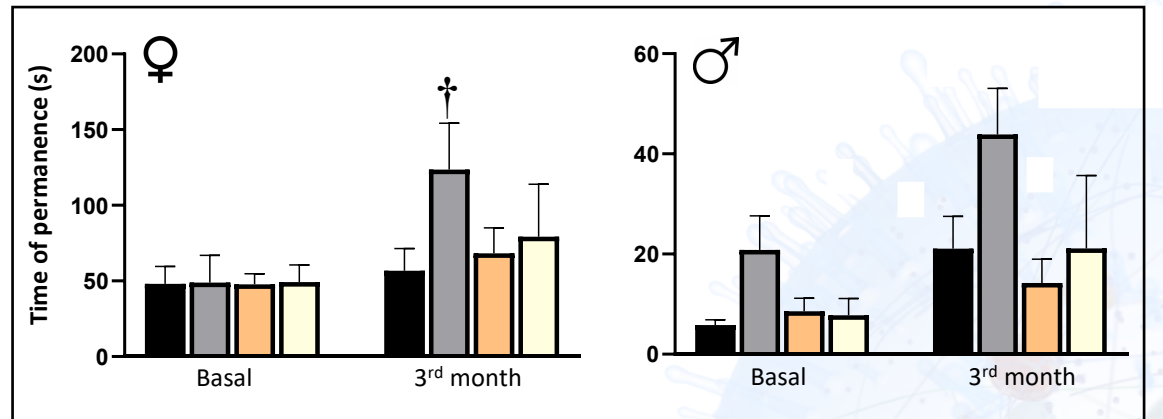
Reverse test







Radial maze results (spatial memory)



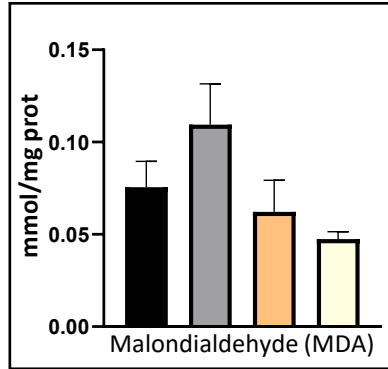
Rota-rod results (motor performance)



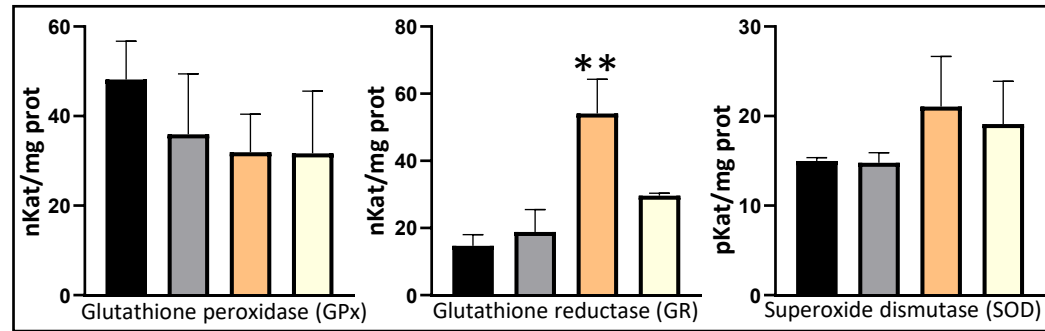
OXIDATIVE STRESS MARKERS

Control 
 Classic beer 
 Non-alcoholic beer 
 Non-etOH beer with ethanol added 

Oxidative stress biomarker in cerebellum



Activity of antioxidant enzymes in cerebellum

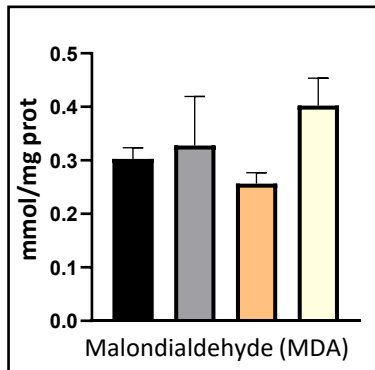


Preliminary data

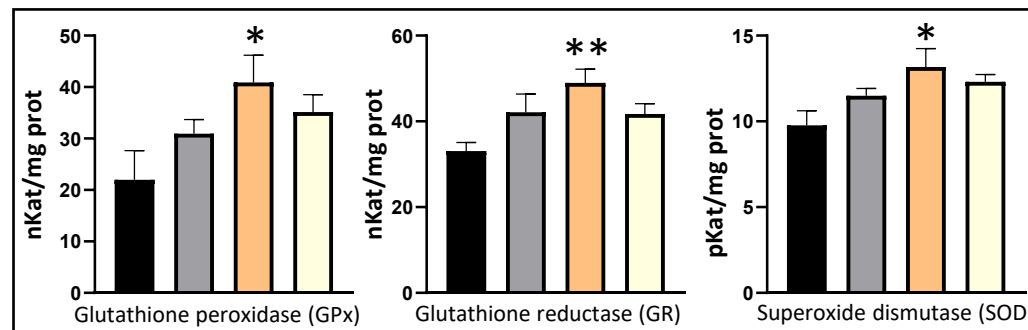
♀ Female



Oxidative stress biomarker in cerebellum



Activity of antioxidant enzymes in cerebellum



♂ Male

CONCLUSSIONS

- There are gender differences in the aging effect on memory and motor performance in rats
- Moderate beer consumption increase plasma polyphenol levels and do not produce negative effect on memory and motor performance in old rats
- Moderate consumption of non-alcoholic beer seems to induce a slight improvement in cognitive performance in old female, but not in old male rats
- Moderate consumption of classical beer seems to induce a slight improvement in motor coordination in older animals from both genders
- Moderate beer consumption do not increase oxidative stress damage in cerebellum of old rat; but also consumption of non-alcoholic beer increase antioxidant enzymes activity in cerebellum of old male rats
- Alcoholic fraction from beer interferes with its potential neuroprotective effect, although complementary analyses are needed for consistent conclusions