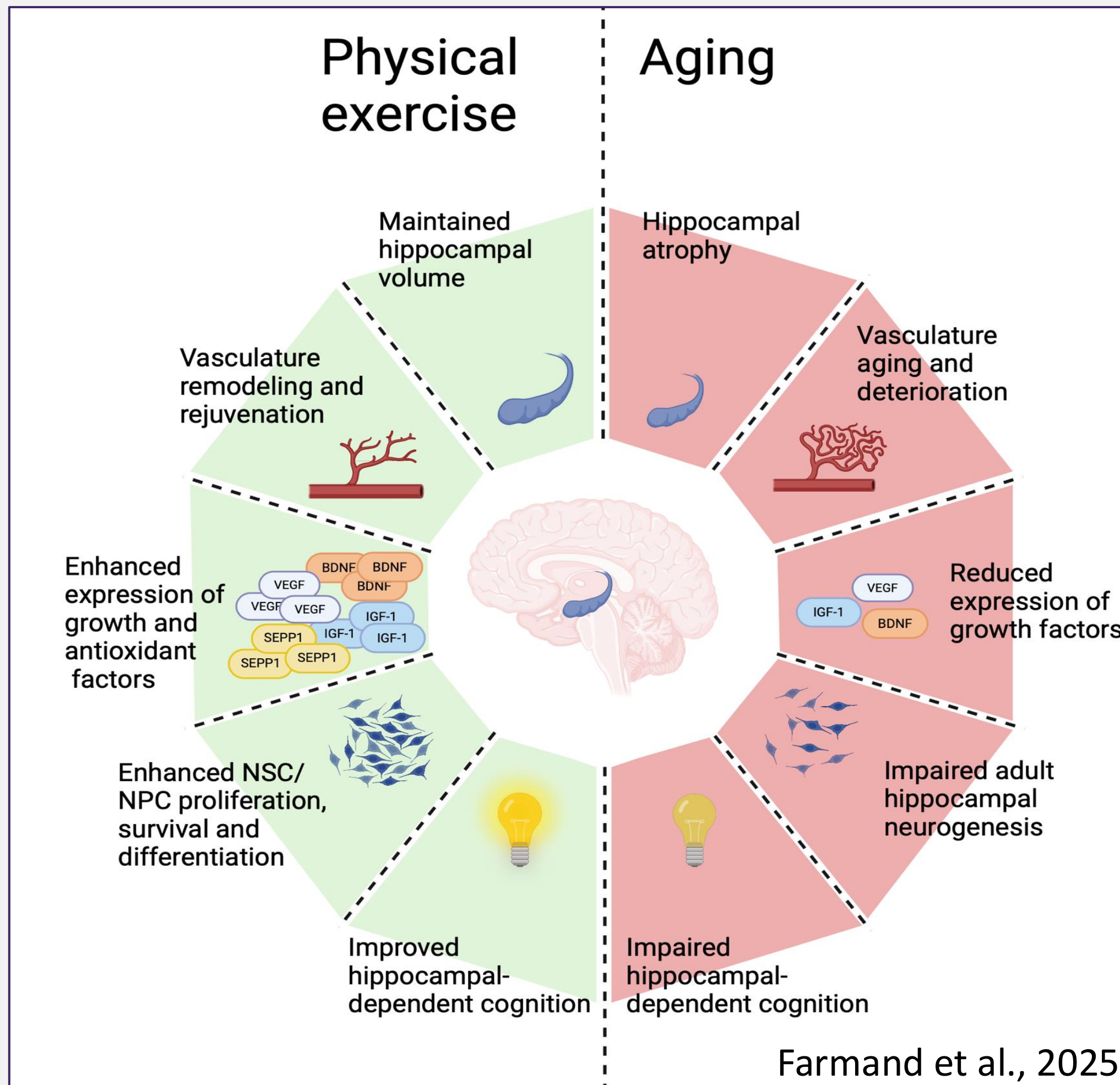


Background



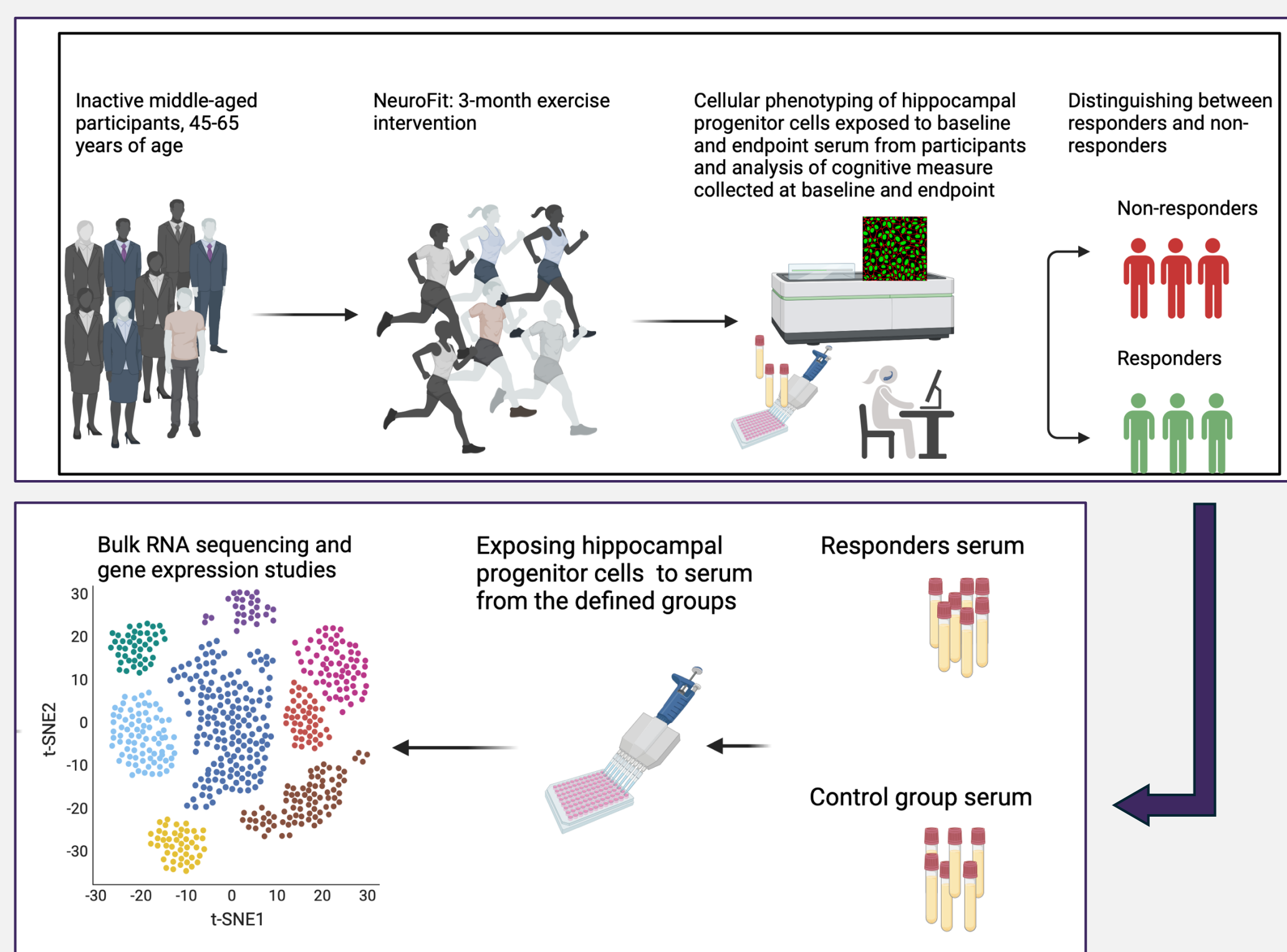
Knowledge gap?

Underlying pathways by which exercise regulates fate of human hippocampal progenitor cells and its impact on cognition.

Aims

- Investigate the effects of exercise on hippocampal dependent cognition and overall well-being.
- Investigate the impact of exercise on progenitor cells' fate and aging.
- Identify the molecular pathways through which exercise regulates hippocampal progenitor cells.

Methods and study design



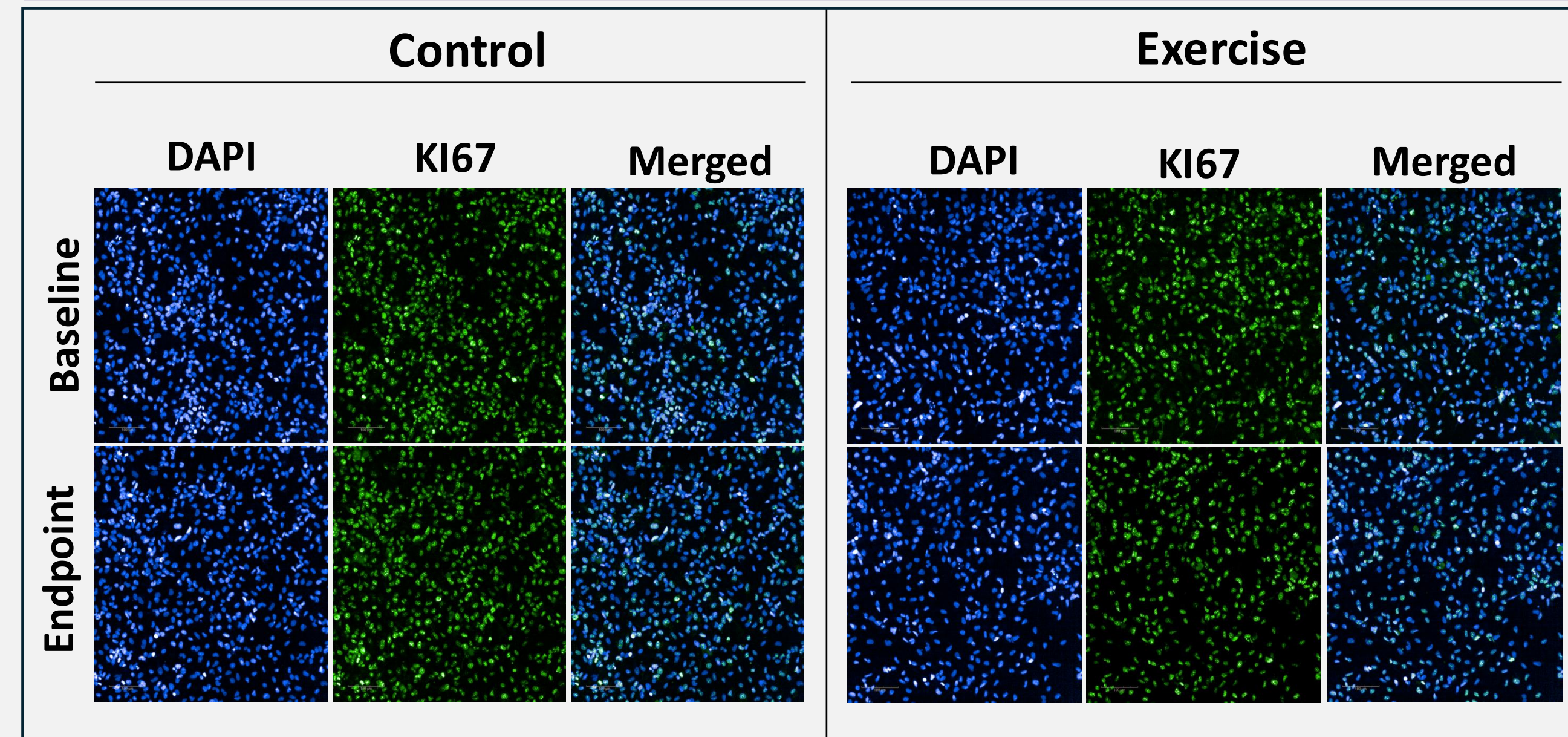
Findings

Participant demographics for the NeuroFit randomised controlled trial

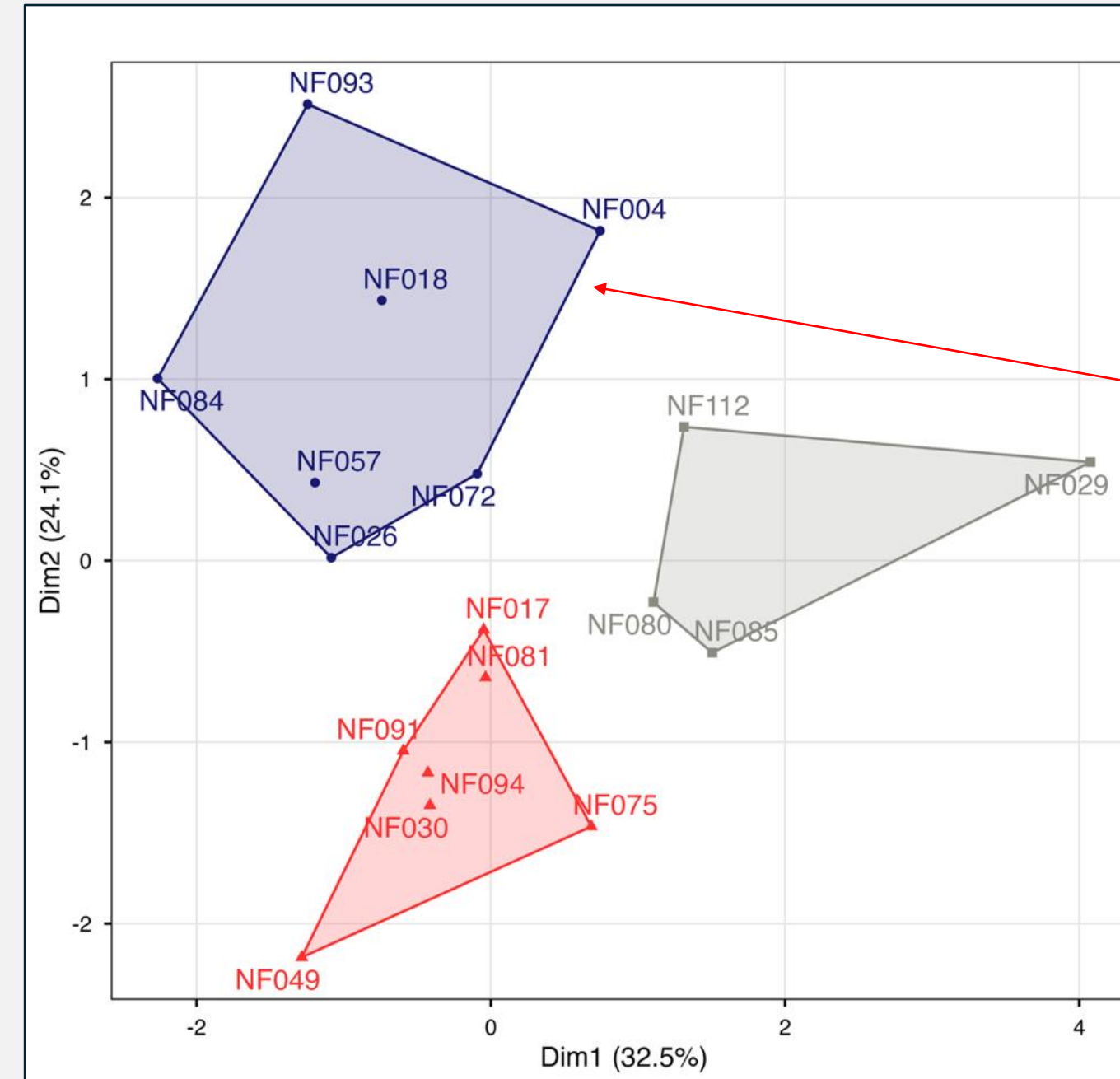
CHARACTERISTIC	CONTROL N = 25 ¹	EXERCISE N = 27 ¹
Age (years)	56.7 (5.2)	53.7 (6.5)
Sex		
Female	17 (68%)	20 (74%)
Male	8 (32%)	7 (26%)
Ethnicity		
Asian or Asian British - Chinese	0 (0%)	1 (3.7%)
Asian or Asian British - Indian	1 (4.0%)	1 (3.7%)
Black or Black British - African	2 (8.0%)	2 (7.4%)
Black or Black British - Caribbean	1 (4.0%)	1 (3.7%)
Mixed - multiple ethnic groups	1 (4.0%)	0 (0%)
Other ethnic groups - Other	1 (4.0%)	3 (11%)
White British/Welsh/Scottish/Northern Irish	13 (52%)	13 (48%)
White - Irish	0 (0%)	2 (7.4%)
White - Other	6 (24%)	4 (15%)
Education		
Secondary	3 (12%)	3 (11%)
Bachelor's degree	7 (28%)	9 (33%)
Master's degree	8 (32%)	7 (26%)
Doctorate degree	2 (8.0%)	2 (7.4%)
Other	5 (20%)	6 (22%)

¹Mean (SD); n (%)

Three months of exercise significantly reduced the expression of proliferation marker in human hippocampal progenitor cells, *in vitro*



Individuals in the exercise group exhibit varied responses to exercise across cognitive and mental well-being domains



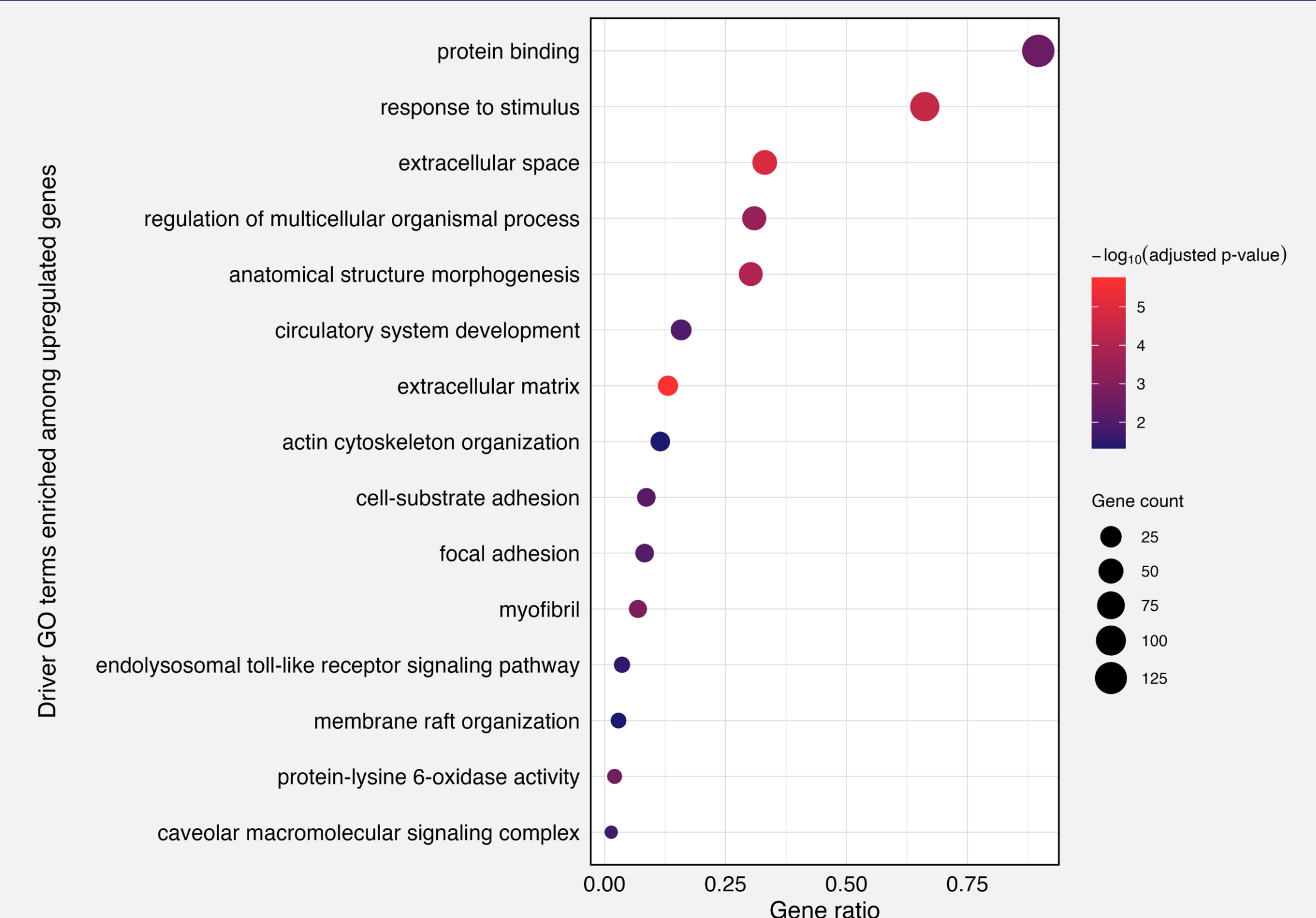
PCA analysis of participants in the exercise group.

Cluster 1: Improvement in pattern separation and physical well being levels, as well as reduced expression of Ki67, representing a domain specific responder group.

Cluster 2: Decline in pattern separation and mood.

Cluster 3: Improvement in mental well being and global cognition.

RNA sequencing of cells treated with responder vs control serum revealed ECM remodelling and responsiveness to stimuli as main upregulated pathways



Three months of exercise significantly improved mood but did not affect hippocampal dependent cognition

PHQ9 score; measuring depressive symptoms
LDI score; measuring pattern separation

