Identification of Autophagy-related miRNA-mRNA Regulatory Network in Calorie-restricted Mouse Brain



Atakan Ayden¹, Elif Yılmaz¹, Bilge G. Tuna² Ayşegül Kuskucu³, Ömer F. Bayrak³, Andrés Aravena⁴ and Soner Doğan⁵

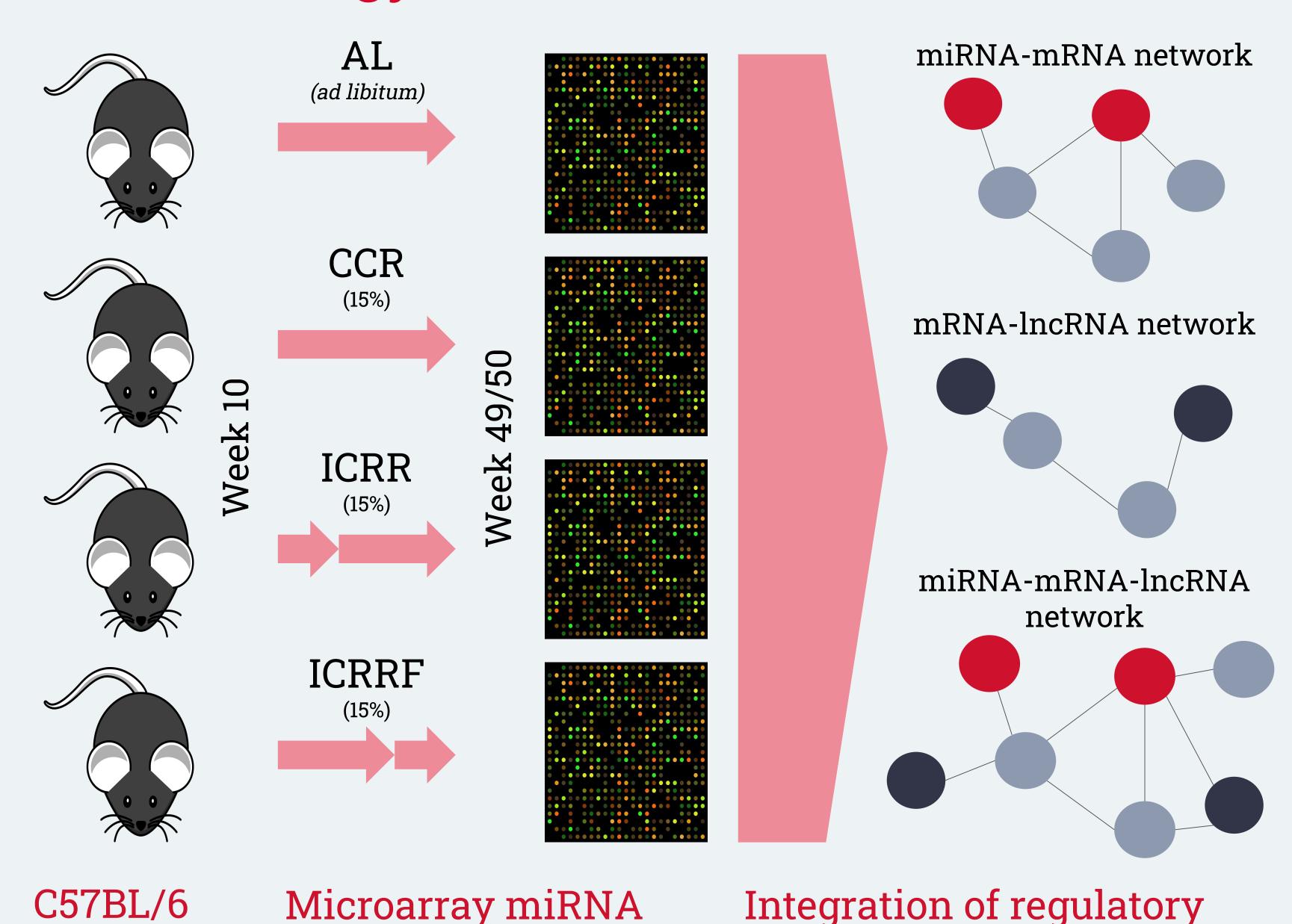
Departments of Biolotechnology¹, Biophysics², Genetics³, Yeditepe University, Istanbul, Turkey; Department of Molecular Biology and Genetics⁴, Istanbul University, Turkey

Background

- Research on autophagy as a key regulator of neurodegeneration has increased recently.
- Caloric restriction (CR) is an anti-aging regimen that stimulates autophagy.
- Complete understanding of miRNA expression change following CR could reveal how calorie restriction prevents neurodegeneration via autophagy.

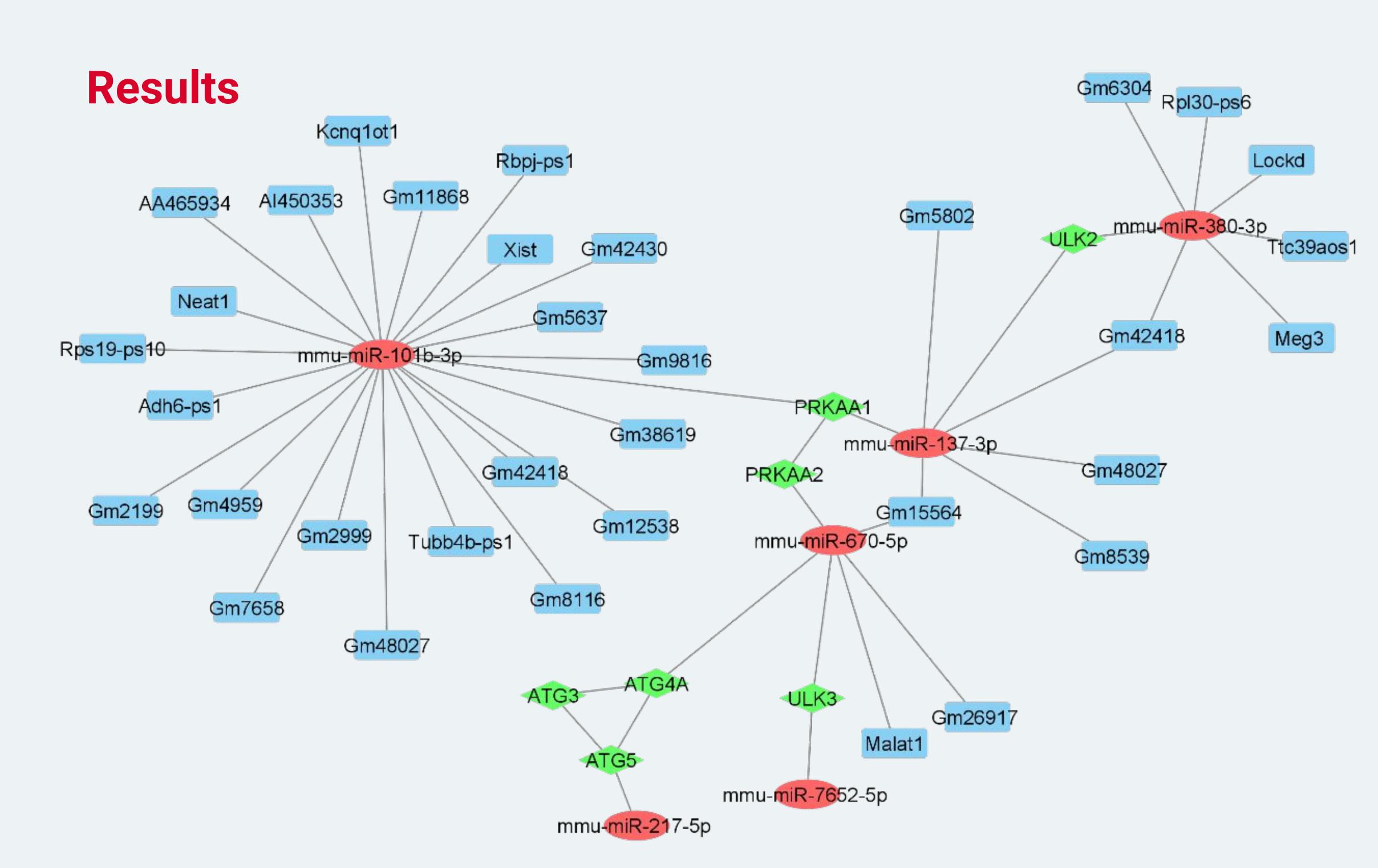
Methodology

mice



networks

profile after dieting



- 1. Through the integrated analysis, we identified 8 miRNA-mRNA pairs, and 36 lncRNA-miRNA pairs.
- 2. Gm15564, miR137/670, PRKA1/2 axis is the most central subnetwork.
- 3. Using mirGen, we discovered that miRNAs targeting autophagy-related genes had the greatest impact on glioma and MAPK signaling pathways.

Conclusion

1. We show that a lncRNA-miRNA-target gene regulation network is may involved in the neuroprotection via autophagy in the CR-aplied mouse brain.

