

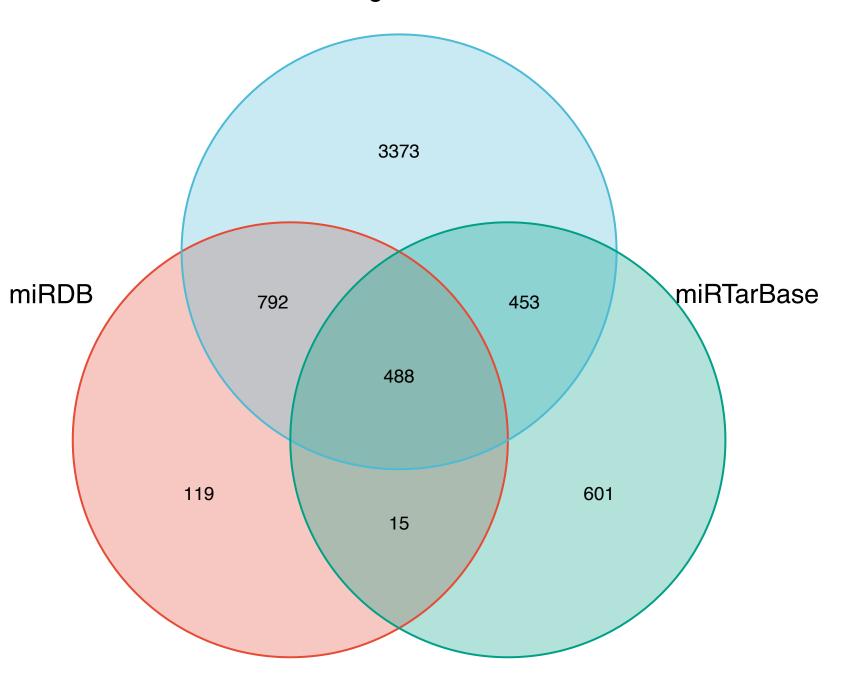
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## The Role of Extracellular Vesicle miR-16-5p in

# **Mediating Long-Term Effects of Childhood Trauma**

### INTRODUCTION

- Early life stress (ELS), affects metabolism, neurotransmitter systems, immune response, and brain development, potentially leading to anxiety, depression, and other mental health issues later in life<sup>1</sup>.
- Target gene prediction of miR-16-5p (overlap of targetscan, miRDB and miRTarBase) TargetScan

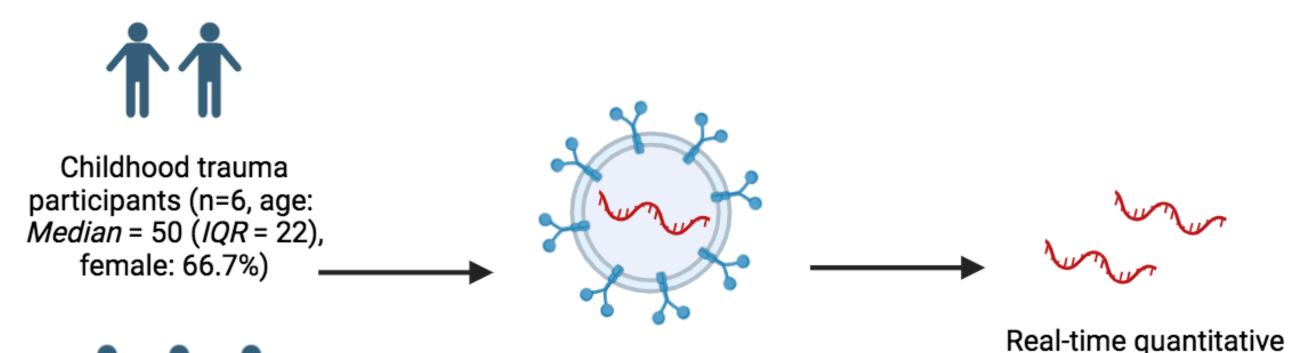


• Extracellular vesicles (EVs) might play a role in how ELS affects the body by participating intercellular communication, e.g. through their microRNA (miRNA) cargo<sup>2</sup>.

#### AIM

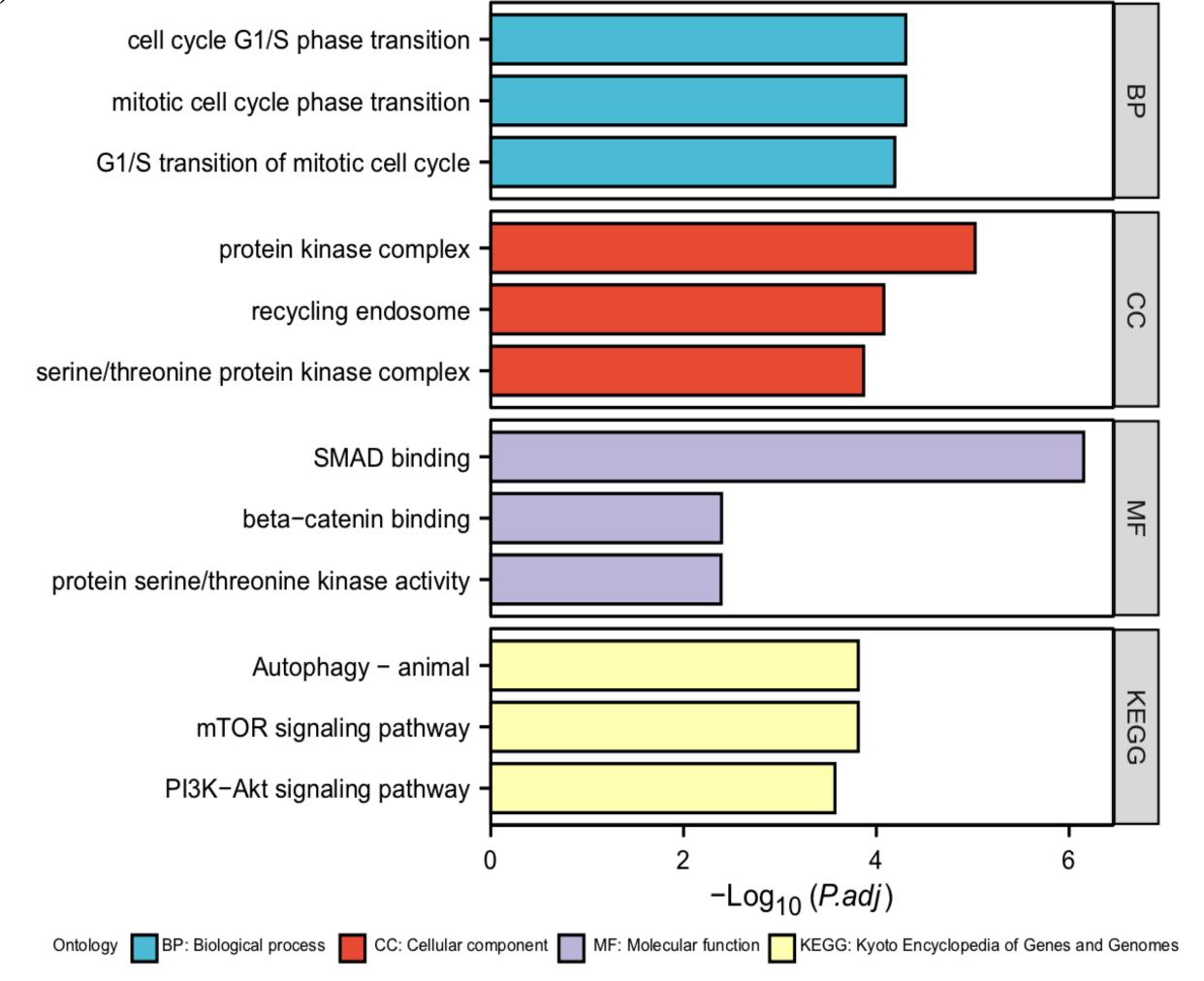
• The aim of this study was to analyze whether childhood trauma, a form of ELS, affects EV miRNAs and thereby the potentially the body, even at later stages in life.

#### METHOD



Isolating plasma EVs

Biological function analysis of miR-16-5p (clusterProfiler [4.4.4] in R).





Healthy controls (n=9, age: *Median* = 28 (*IQR* = 15), female: 55.6%)

Identify the well-known miRNA in stress homeostasis by literature research The possible biological functions were determined by target gene prediction (targetscan, miRDB and miRTarBase) and pathway analysis

(clusterProfiler in R)

PCR to detect the

differentially expressed

EV miRNAs

#### RESULTS

• Differentially expressed EV miRNA between childhood trauma participants and healthy controls

**Up-regulated** 

**Down-regulated** 

#### Conclusion

- The results showed that ELS leads to persistent changes in plasma EV cargo, with more than 20 miRNAs differentially regulated even decades later.
- EV miR-16-5p modulates key pathways (mammalian target of rapamycin (mTOR) signaling pathway and phosphatidylinositol-4,5-bisphosphate 3-kinase (PI3K)/protein kinase B (Akt) signaling pathway) involved in the stress homeostasis, neuroplasticity, and neurodevelopment, acting as a molecular mediator that translate early environmental challenges into long-term biological and

miR-518e-3p	miR-26b-5p	miR-20b-5p
miR-421	miR-19a-3p	miR-24-3p
miR-520h	miR-25-3p	miR-126-3p
miR-330-3p	miR-195-5p	miR-223-3p
miR-105-5p	miR-451a	miR-17-5p
miR-542-5p	miR-16-5p	miR-19b-3p
	miR-106a-5p	miR-18a-5p
	miR-140-3p	miR-23a-3p

• The literature research revealed that miR-16-5p is a well-studied miRNA in endocrine, neural, and stress homeostasis<sup>3,4</sup>.

#### behavioral outcomes.

• We plan further functional validation experiments to prove these predictions.

#### REFERENCES

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