Using Plasma to Improve Diagnosis and Treatment of Brain Diseases

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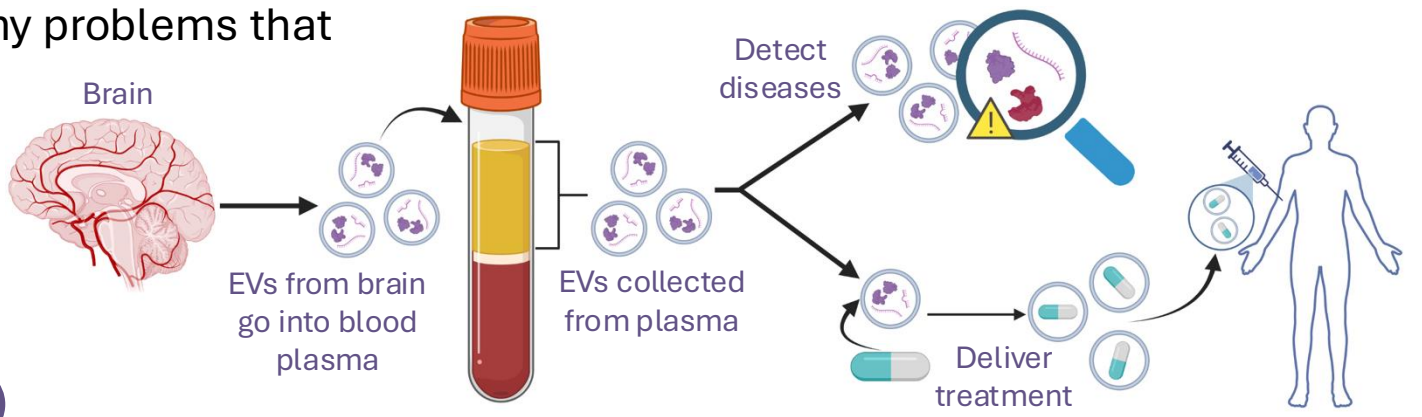
citizens of science

Background

Brain diseases, like Alzheimer's disease and stroke, are very difficult to and they do not have successful treatment. Here, we are focused on looking at extracellular vesicles (EVs), small bubbles produced by all cells carrying cargo from one cell to deliver to another. EVs with cargo from brain cells can cross barriers and found in blood plasma. We can look at the cargo of EVs from the brain for any problems that show there are brain diseases, or we can use then to deliver treatment across barriers and into the brain.



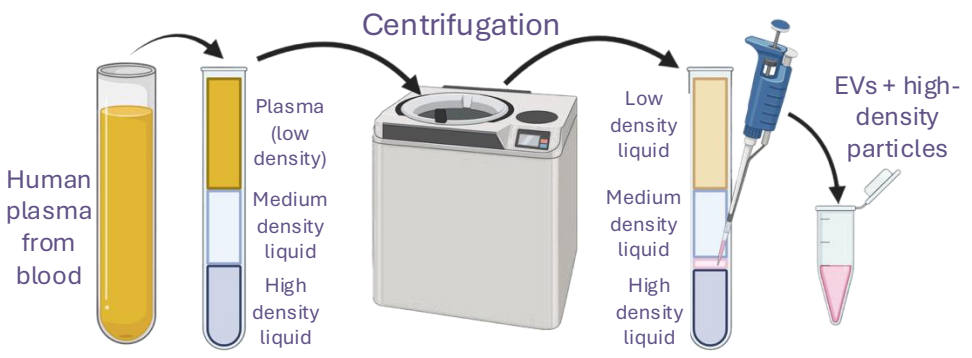
Aim & Hypothesis

Aim: collect EVs from blood plasma and other particles. It is hypothesised that EVs will be collected and particles in plasma that are smaller or have higher densities are removed.

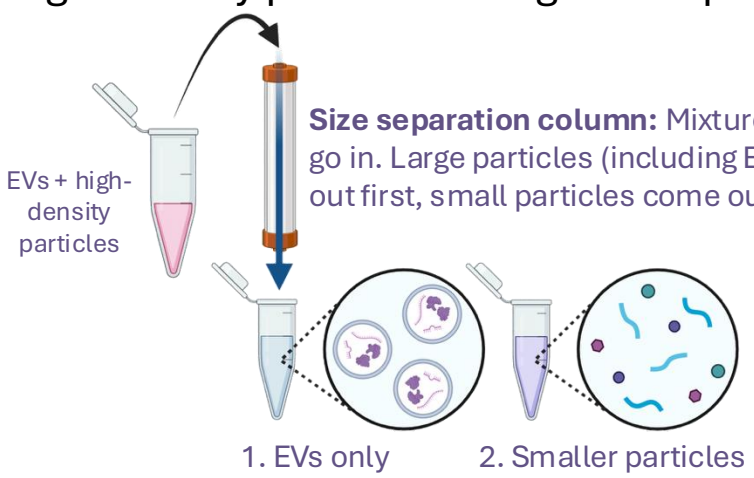
Method

Two separation techniques are required to collect EVs:

1. Collect EVs and high-density particles from human blood plasma using centrifugation



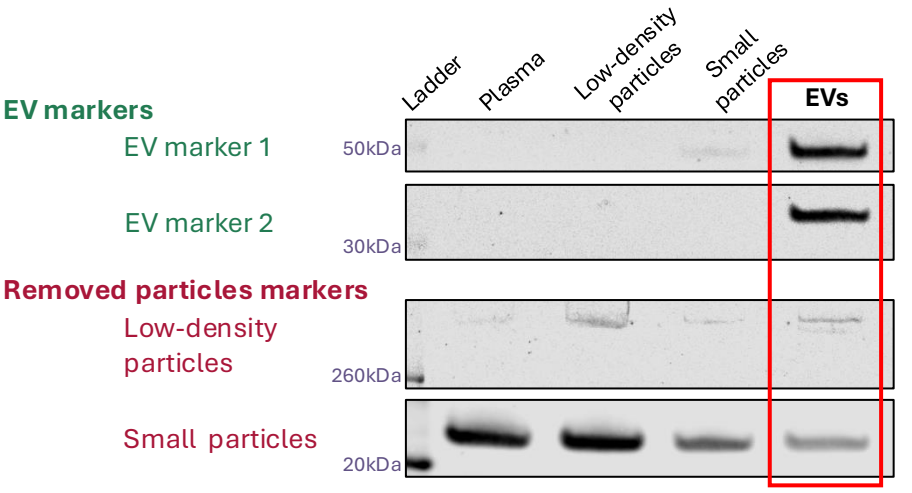
2. Collect **large high-density EVs** from smaller high-density particles using size separation



Results

Western blot – used to look for specific proteins that show presence/absence of EVs. Specific protein markers are chosen for

1. Proteins from EVs
2. Proteins on removed particles



Key Takeaways

- EVs were successfully collected from plasma
- Cargo of collected EVs can be studied to look for problems that come from brain diseases
- Collected EVs can be loaded with treatment cargo to bring across barriers and deliver to sites of brain diseases