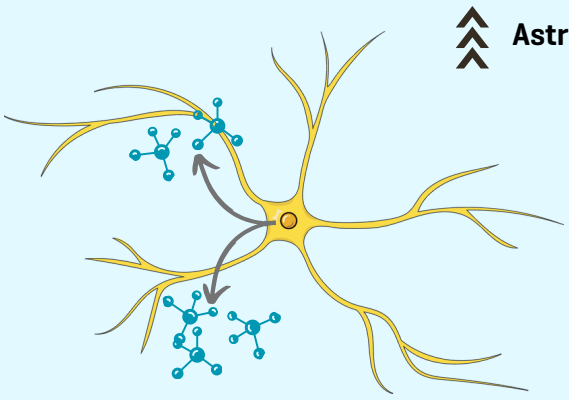
Alzheimer versus resilient group



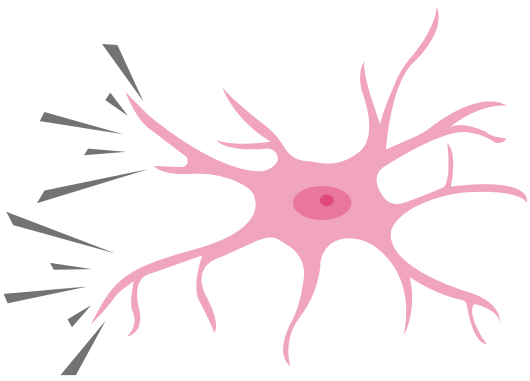
Astrocytes

Astrocytes keep the chemical environment of nerve cells constant.
One way they do this is by producing metallothionein.
This is an antioxidant.

In the resilient group, astrocytes produce more antioxidants. This is protective.

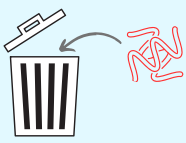
Microglia

Microglia are the immune cells of the brain.
Earlier research shows that there is a specific pathway which causes microglia to switch to a more toxic variant.
In this state they are too aggressive, making the inflammation worse.

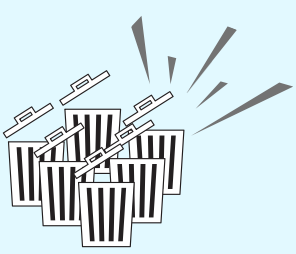


In the resilient group there are fewer toxic microglia.

Unfolded protein response



The unfolded protein response removes incorrectly folded toxic proteins.
This is good in principle.

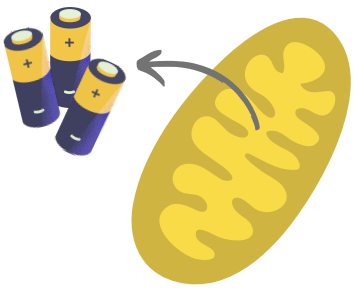


However, in Alzheimer's disease this reaction becomes overactive. This eventually causes damage.

In the resilient group there are signs that the unfolded protein response is not overactive yet.

Mitochondria

Mitochondria are the energy factories of the cell.
Earlier research shows that these are not functioning correctly in Alzheimer's patients.
This causes a lack of energy in their nerve cells, which can lead to damage.



In the resilient group there are potentially more mitochondria present in the nerve cells. This causes better energy production.

It is difficult to determine whether something is a cause or an effect from this kind of data. Instead, this is done by changing something in cells or mouse models, and observing the result. That is therefore the next step in this line of research.

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