



## Star-shaped brain defence

Astrocyte cells in the brain can help defend against central nervous system tuberculosis.

**Sohair Geyer** is a PhD candidate in immunology, infectious diseases and neuroscience at the University of Cape Town.



### Scholarship programme:

SAMRC Internship Scholarship Programme

### Orcid ID:

<https://orcid.org/0000-0002-8372-6717>

### Additional information:

<https://internal-journal.frontiersin.org/articles/10.3389/fnmol.2019.00057/full>

Presented in association with the South African Medical Research Council, this programme forms part of #theArtofResearch, an initiative of research communication specialists Jive Media Africa.



The ancient Egyptians believed that the heart was the hub of a person's thoughts, emotions and personality. During mummification, most brains were removed, as they were not considered essential and therefore not necessary for the afterlife.

Today, we have a clearer understanding of the brain's importance and why there are so many effective barriers in place to protect it. Despite this, various pathogens have developed methods of circumventing these host defences, often having chronic implications or proving to be fatal.

In its severest form, tuberculosis manages to penetrate the central

nervous system. Central nervous system TB (CNS-TB) mainly affects young children and immune-compromised individuals. An infection usually results in neurological injury and often leads to death.

Researchers at the University of Cape Town have been investigating astrocytes, a resident brain cell, to understand how they respond to TB infection and whether they have therapeutic potential.

"These star-shaped cells are known for their dynamic role in maintaining healthy brain function, but have recently been gaining recognition for their contributions to host protection," says Sohair Geyer.

The team found that during TB infection, astrocytes have the ability to generate a response by releasing factors that help recruit immune cells to the brain.

"This amplification of inflammation could cause injury to this delicate area, but their simultaneous release of neurotrophic factors may potentially protect the surrounding neurons," says Geyer.

"The astrocyte reaction is a bit of a double-edged sword, with both beneficial and detrimental responses, but the factors identified in this study could be exploited to the benefit of the patient."



*Astrocytes can help defend the brain against tuberculosis infection.*