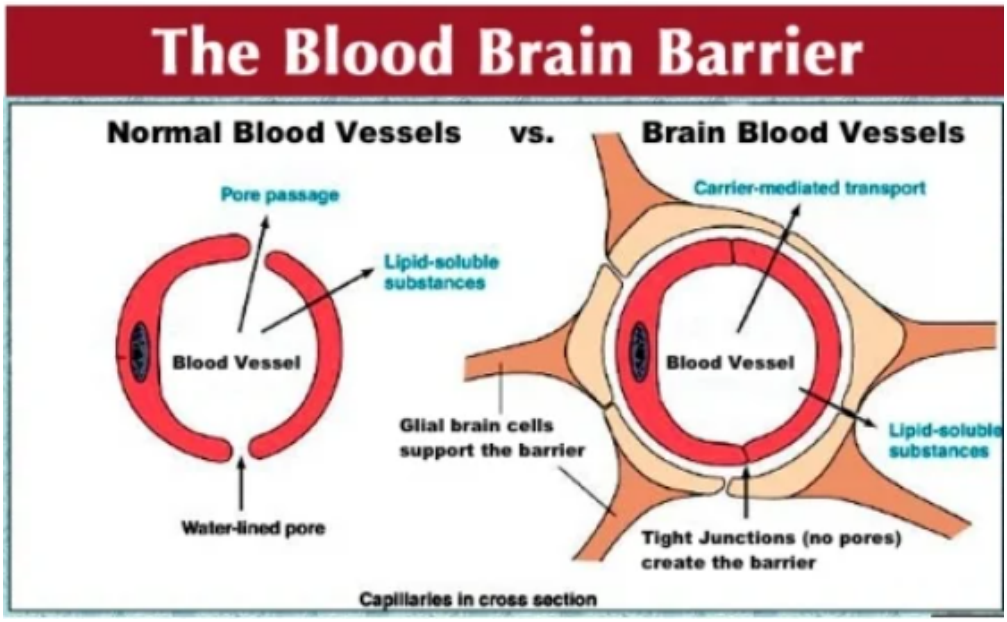
Brain Microbiome in Fish

Why in News?

A new study, published in Science Advances, shows that bacteria can not only make their way to the brain, they can thrive there.

- **Study species** – Salmon and Trout.
- **Observation** – Using DNA extraction and microscopic imaging, it was identified that *bacteria were living in the fishes' olfactory bulbs and other brain regions*.
- **Evasion of blood brain barrier** – Microbes possessed unique adaptations that helped them breach the blood-brain barrier.
- Some produced molecules called *polyamines* that can open tight junctions in the barrier fluid
- Others were able to *evade immune responses* or outcompete their rivals, ensuring their survival in the brain's delicate environs.

> ***Blood-brain barrier (BBB)*** *is a tightly locked layer of cells that defend the brain from harmful substances, germs and other things that could cause damage.*



- **Adaptability of bacteria** - Some bacteria seemed to have *colonised the brain much before the blood-brain barrier* had evolved to its present form.
- Others likely travelled up from the gut or the bloodstream, continuously infiltrating the brain throughout the fishes' lives.
- **Significance of the study** – It opens the door to rethinking the brain's microbiome in vertebrates, including humans.

- If bacteria can thrive on fish brains, it's *possible they may do so on human brains* as well.

Reference

The Hindu| Bacteria's thriving in Fish Brain