Mycobacterium leprae

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In news– A group of researchers have found that armadillo livers grew substantially when infected with *Mycobacterium leprae*.

What is Mycobacterium leprae?

- *Mycobacterium leprae*, is one of the two species of bacteria that **cause Hansen's disease**, **a chronic but curable infectious disease** that damages the peripheral nerves and targets the skin, eyes, nose, and muscles.
- It is an acid-fast, Gram-positive, rod shaped bacterium and an obligate intracellular parasite, which means, unlike its relative *Mycobacterium tuberculosis*, **it cannot be grown in cell-free laboratory media.**
- This is likely due to gene deletion and decay that the genome of the species has experienced via reductive evolution, which has caused the bacterium to depend heavily on its host for nutrients and metabolic intermediates.
- It has a **narrow host range and apart from humans, the only other natural hosts are nine-banded armadillo and red squirrels**.
- The bacteria infect mainly macrophages and Schwann cells, and are typically found congregated as a palisade.

Key findings-

- The **pathogen was able to maintain liver function and keep its exquisite architecture intact,** giving rise to something that looked like stem cells.
- **The researchers documented the in-vitro discovery of Mycobacterium leprae's ability** to reprogram adult Schwann cells, the bacteria's preferred host niche in the peripheral nervous system, "to a stage of

progenitor/stem-like cells".

- Armadillos came into the picture because they are among the few animals that leprosy bacteria infect.
- **The bacteria was performing something akin to 'biological alchemy'** – a bacterial pathogen was changing the biology of infected cells to become more 'valuable' such that it can promote the growth of a vital organ like the liver in living animals.
- **No currently available cell therapy can rival this mysterious mechanism,** which researchers describe as a natural process stemming from evolutionary training.
- The leprosy bacteria need functional cells to function within it because of its dependency on the host to survive and replicate.
- The bacteria have evolved and perfected the system to grow the tissues for them to live.
- Several researchers remain sceptical about how the leprosy bacteria will impact a human liver, while others point out that a longer-term study is needed to gauge any adverse effects.
- Since the bacteria's functions do not involve tumour formation or any adverse effects like fibrosis, it appears safe for now.
- Now that this ability has been identified, the next step is to understand its mechanism.