Multi-drug Resistant Pathogens in ISS

Source: DTE

Why in News?

Recently, a collaborative study between scientists from the **Indian Institute of Technology Madras (IIT-M)** and **NASA's Jet Propulsion Laboratory (JPL)** focused on understanding the behaviour of multi-drug resistant pathogens aboard the **International Space Station (ISS).**

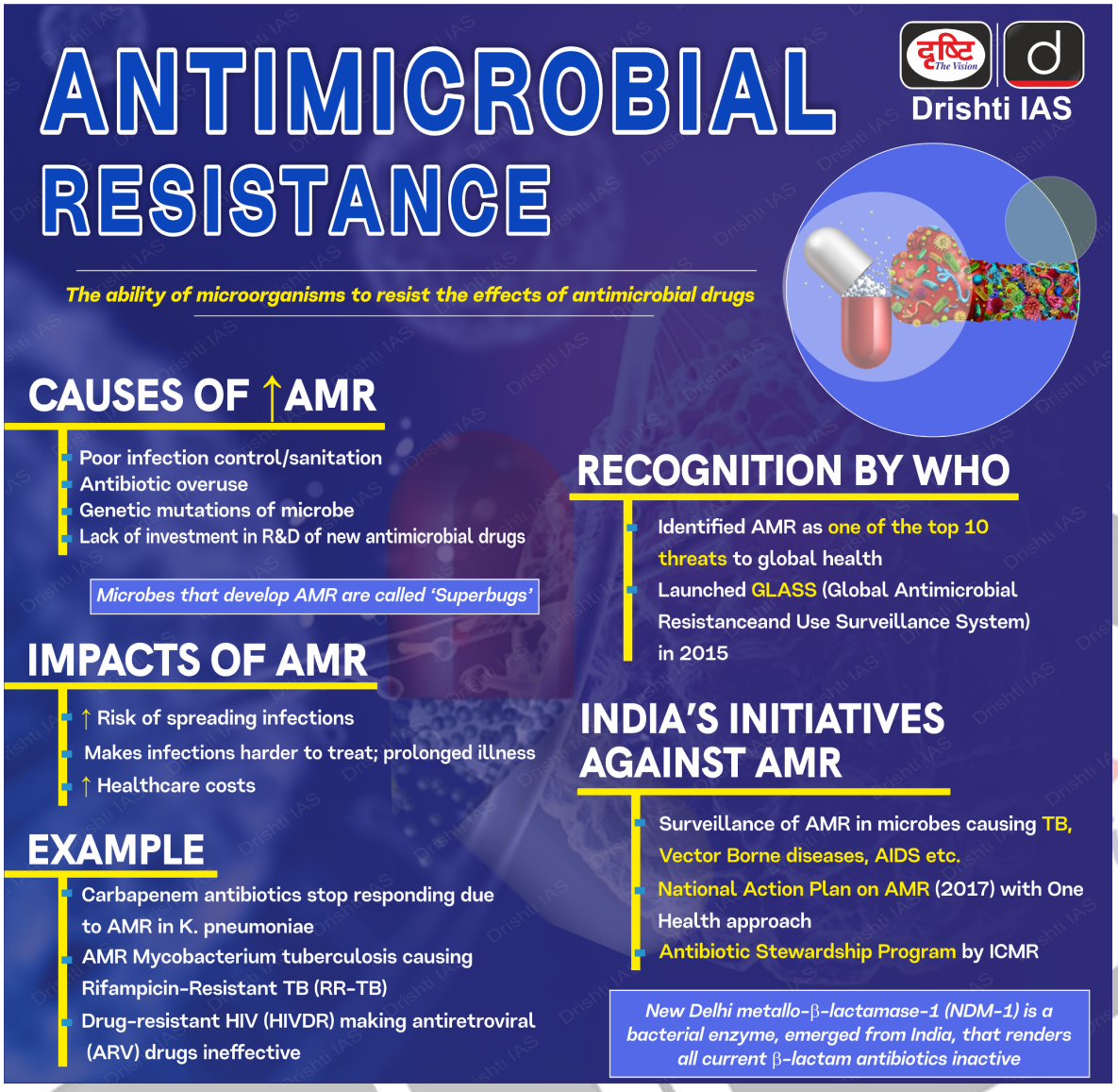
What are the Key Highlights of the Study?

- ***Enterobacter bugandensis is associated with hospital-acquired infections and poses a significant treatment challenge due to its broad resistance to third-generation antibiotics like cephalosporins and quinolones.***
    - It is listed by the **World Health Organization (WHO)** as a priority for developing **new antimicrobials.**
- The ISS's unique environment of **microgravity**, heightened **carbon dioxide**, and **increased radiation** revealed **accelerated mutations** that differentiate them **genetically** and **functionally** from their **Earth counterparts**.

Antimicrobial Resistant-Microbes

- **Antimicrobial-resistant microbes** occur naturally and are found in people, animals, food, and the environment (in water, soil and air).
- **They can spread between people and animals, including from food of animal origin, and from person to person.**
- AMR is facilitated by the **inappropriate use of medicines**, for example, using antibiotics for viral infections such as the flu.

//



International Space Station

- The **ISS** is a **large spacecraft** that **orbits Earth** at a **low altitude (approx 250 km)**, hosting astronauts from various countries who **live and work there**.
- It **serves as a research laboratory** where scientific experiments are conducted in microgravity conditions, advancing our understanding of space and benefiting life on Earth.
- The International Space Station is currently **managed by the US, Russia, Canada, Japan, and European space agencies.**
- Since 2000, the station evolved from an outpost into a highly capable **microgravity laboratory.**
- Since 2000, the ISS has transformed from a **basic outpost into an expansive microgravity research facility,** accommodating over 260 people from 21 countries, with plans for research until 2030.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Prelims:

Q. Which of the following are the reasons for the occurrence of multi-drug resistance in

microbial pathogens in India? (2019)

1. Genetic predisposition of some people
2. Taking incorrect doses of antibiotics to cure diseases
3. Using antibiotics in livestock farming
4. Multiple chronic diseases in some people

Select the correct answer using the code given below.

(a) 1 and 2

(b) 2 and 3 only

(c) 1, 3 and 4

(d) 2, 3 and 4

Ans: (b)

Mains

Q. Can overuse and free availability of antibiotics without Doctor's prescription, be contributors to the emergence of drug-resistant diseasesin India? What are the available mechanisms for monitoring and control? Critically discuss the various issues involved. **(2014)**