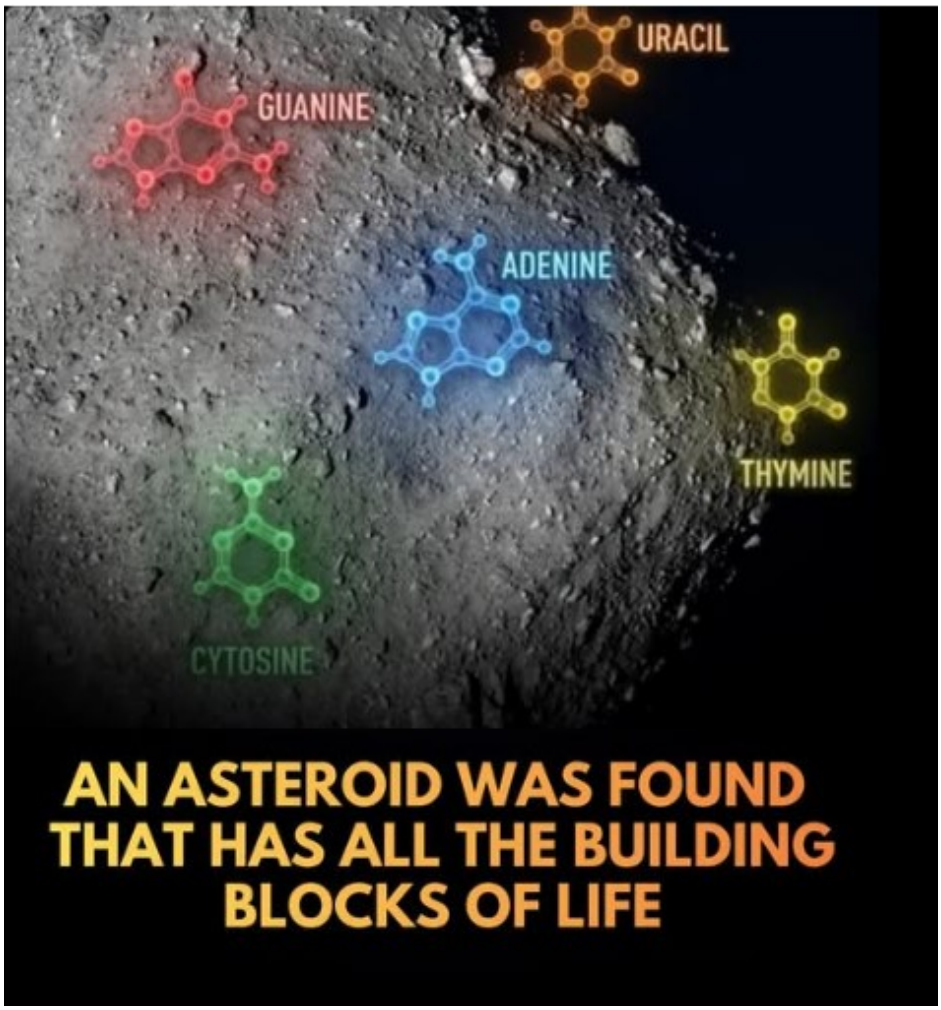
DNA and RNA discovered in a 4.5-billion-year-old asteroid

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Why in News?

Scientists have confirmed the presence of all five essential DNA and RNA nucleobases—adenine, guanine, cytosine, thymine, and uracil—in pristine samples from the 4.5-billion-year-old asteroid Ryugu.

- **The Five Nucleobases –** Adenine and guanine (purines), plus cytosine, thymine, and uracil (pyrimidines).
- **The Source –** The material was gathered by Japan Aerospace Exploration Agency's (JAXA) Hayabusa2 mission, which returned 5.4 grams of uncontaminated space rock to Earth in 2020.
- **Timeline of Discovery –** Scientists previously detected uracil in the Ryugu samples in 2023, and a full suite of all five nucleobases was confirmed in a study published in *Nature Astronomy*.
- Similar findings have also been reported from samples of the asteroid Bennu.
- **What This Means –** These nitrogen-containing organic molecules are the fundamental "letters" of genetic information.
- Finding them preserved in ancient asteroids supports the theory that the raw, non-biological chemical ingredients for life were widespread across the early Solar System and delivered to Earth via asteroid impacts.



Reference

[Science Daily| DNA and RNA discovered in a 4.5-billion-year-old asteroid]

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