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Our brain may navigate using just smells: Study

What is in news?

"The mammalian brain can form a map of its surroundings based solely on smells, a study has found."

Study done by:

- ✓ Researchers at Northwestern University in the US have developed.

About news:

- ✓ Researchers from the US have developed a new "smell virtual landscape" that enables the study of how smells engage the brain's navigation system.
- ✓ The olfactory-based virtual reality system could lead to a fuller understanding of odour-guided navigation and explain why mammals have an aversion to unpleasant odours, an attraction to pheromones and an innate preference to one odour over another, researchers said.
- ✓ "It is the world's first method to control odourant concentrations rapidly in space for mammals as they move around,"
- ✓ Researchers have long known that odours can guide animals' behaviours.
- ✓ However, studying this phenomenon has been difficult because odours are nearly impossible to control as they naturally travel and diffuse in the air.
- ✓ By using a virtual reality system made of smells instead of audio and visuals, Dombeck and graduate student Brad Radvansky

created a landscape in which smells can be controlled and maintained.

- ✓ "Imagine a room in which each position is defined by a unique smell profile," "And imagine that this profile is maintained no matter how much time elapses or how fast you move through the room," Radvansky said.
- ✓ That is exactly what Dombeck's team developed, using mice in their study.
- ✓ Aided by a predictive algorithm that determined precise timing and distributions, the airflow system pumped scents - such as bubblegum, pine and a sour smell - past the mouse's nose to create a virtual room
- ✓ Mice first explored the virtual environment through both visual and olfactory cues.
- ✓ Researchers then shut off the visual virtual reality system, forcing the mice to navigate the room in total darkness based on olfactory cues alone.
- ✓ The mice did not show a decrease in performance.
- ✓ Instead, the study indicated that moving through a smell landscape engages the brain's spatial mapping mechanisms.
- ✓ Not only can the platform help researchers learn more about how the brain processes and uses smells, it could also lay the groundwork for human applications.
- ✓ "Development of virtual reality technology has mainly focused on vision and sound," Dombeck said.
- ✓ "It is likely that our technology will eventually be incorporated into commercial virtual reality systems to create a more immersive multisensory experience for humans," he said.

Prelims Question:

Q) Statements about smell virtual landscape

1. This enables the study of how smells engage the brain's navigation system.
2. The mammalian brain can form a map of its surroundings based solely on smells.

Which of the above statements is/are correct?

a. Only 1
b. Only 2
c. Both
d. None

Ans: c

Mains Question:

Q) Explain about new study that our brain may navigate using just smells.