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Motion sickness

Motion sickness is thought to be connected to our vestibular system – the delicate structure in the ear responsible for balance

Maridav / Alamy

A third of people are highly susceptible to motion sickness, and almost all of us have felt it at some time. Yet, it has long been a mystery why certain movements should make us feel nauseous 🔗 https://www.ncbi.nlm.nih.gov/pubmed/12962599. Clearly, it has something to do with balance because it is not confined to humans, but occurs in any animal that has a vestibular system 🔗 https://www.ncbi.nlm.nih.gov/pubmed/23000611 – the delicate structure deep inside the ear responsible for balance.

The main structure in the vestibular system is a trio of fluid-filled, semi-circular canals, [illegible]oned at right angles to one another. When your head moves, so do the contents of [illegible] canals. This results in signals being sent to two parts of your brain – the

cerebellum 🔗 /article/mg23931850-400-the-brains-secret-powerhouse-that-makes-us-who-we-are/, which is responsible for balance and movement, and the brainstem, which contains regions that trigger nausea and vomiting.

An early suggestion was that motion sickness is simply the result of overstimulation of the vestibular system. However, that doesn't fit with the observation that mariners can experience motion sickness when they return to dry land. Such anomalies led to another idea: perhaps it happens when signals coming from the vestibular system do not meet our brain's expectations 🔗 https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1436193/. That would also explain why we don't get motion sickness while pogoing around a dance floor and why the driver of a car is far less likely to feel nauseous than the passengers.

The problem with this idea is that it would require special brain cells to compare signals from the vestibular system with the expected pattern of neural activity, and then trigger nausea if there is a mismatch. Unfortunately, no such neurons exist – or so we thought until researchers studying movement in monkeys accidentally came across them 🔗 https://www.nature.com/articles/nn.4077. One piece of the puzzle is still missing, however. We don't know whether these brain cells, which are situated in the cerebellum, are connected to the brainstem areas that trigger feelings of nausea.