

**News: Issue 29**

Babies suppress own immune system

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A new study has suggested that the immune system of a newborn baby regulates itself to allow the colonisation of beneficial bacteria. When foetuses are developing inside their mother's womb they are in a sterile environment. When they are born, however, they immediately become colonised by bacteria and fungi. The immune system of infants has a very weak response to infections, and it has been assumed that this was due to a lack of maturity. A group of researchers at Cincinnati Children's Hospital in Ohio has challenged this view by comparing the immunosuppressive properties of newborn and adult mice. Surprisingly, baby mice had a higher concentration of CD71+ cells. These cells generate an enzyme called arginase-2, which actively suppresses their immune response. To understand this, Sing Sing Way and his team experimentally knocked

these cells out by providing baby mice with antibodies. Afterwards they infected them with *Listeria monocytogenes*, a bacterium that can cause severe infections, and found that their immune system successfully resisted the attack. But there was a trade-off; as the colonisation of commensal microorganism in the baby's intestinal cells produced an inflammatory reaction, a process that would have otherwise happened smoothly. The challenge now is to understand if a similar process happens in humans. If so, treatments that allow a temporal reduction of CD71+ cells could strengthen the immune system of newborns. This may allow health workers to vaccinate sooner, which could save many lives in developing countries. *Ornela De Gasperin Quintero*

**Giant channels beneath Antarctic ice**

Antarctica is covered in a vast ice sheet that holds close to 90 per cent of the Earth's freshwater reserves. However, climate change means that the potential threat of melting Antarctic ice mass to the globe's ocean levels has become a growing concern. The Antarctic ice sheet is a dynamic system where glaciers continuously push towards the sea. As they move into the ocean, they form ice shelves that float on the water whilst maintaining their connection to the mainland ice sheet. Scientists have used satellite imagery and radar measurements to gain crucial new insights into meltwater flow beneath Antarctica's ice sheets. They showed that large channels run underneath a major ice shelf and that these are extensions of channelised meltwater flow underneath the 'grounded' ice sheet that rests on the land. These findings differ from previous models that suggested water flows in a thin layer beneath the ice sheet. Analysis of the architecture of floating ice shelves could provide key information on the organisation and stability of the water system beneath the ice mass on the continent's mainland. Dr Anne Le Brocq from the University of Exeter stated: "The information gained from these newly discovered channels will enable us to understand more fully how the water system works and, hence, how the ice sheet will behave in the future." The findings will help improve existing models as environmental conditions continue to change. *Nele Dieckmann*

**Getting drunk without the hangover**

Imagine getting drunk at a party and then being able to drive home the same



night, and with no hangover the next day. This may sound like science fiction, but scientists are developing a drug that may do just that. David Nutt, from Imperial College London, has identified five potential compounds which could provide a synthetic alcohol substitute that mimics the positive effects of alcohol without the health risks, danger of addiction or hangover. Alcohol is known to mimic GABA, an inhibitory chemical produced in the brain. The brain contains multiple GABA receptor types, each with different functions. Alcohol non selectively binds to GABA receptors, causing many side effects such as memory impairment and loss of coordination. Unlike alcohol, the new drug selectively targets GABA receptor subtypes responsible for the pleasurable and relaxing effects of alcohol. What's more, it would also come with an antagonist that can rapidly reverse its effects,

thus allowing revellers to sober up quickly. Alcohol addiction and alcohol-related health problems, violence, and accidents are collectively responsible for 2.5 million deaths worldwide each year, so a new safer alternative to the drug is surely to be welcomed. Professor Nutt is looking for investors to develop the drug, but it is unlikely it will be on the market any time soon, considering the regulatory challenges facing new pharmaceuticals. It remains to be seen whether popping a pill could ever replace the ritual of enjoying a drink with friends. *Camilla d'Angelo*

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