BBC

HOW TO PROTECT OUR VIEW OF THE STARS FROM SPACE JUNK

Science Focus

THE BIG BANG MAY NOT BE OUR BEGINNING

WHAT WE KNOW ABOUT THE MEGALODON

HABITS

How to rewire your brain to break bad habits and form healthy ones instead

PLUS

MICHAEL MOSLEY'S 10 HABITS that will help you live longer, feel happier and age well

SF

SCIENCEFOCUS.COM

ISSUE #395 AUG 2023
UK £5.99 US $12.99 CAN $14.99
AUS $14.50 NZ $19.99

IN THIS ISSUE

Health
Giles Yeo explains why the paleo diet is a Flintstones fantasy

Environment
What's at stake if we mine the deep sea

Nature
The terrifying world of animal mouths

BIOLOGY

MOTHERS ARE FORCED TO FIGHT A NUTRIENT WAR WITH THEIR UNBORN BABIES

A study on mice enabled scientists to discover that children inherit 'greedy genes' from fathers

You probably wouldn't dream of demanding more food from your mum, especially if it had to come from her own plate. But new research shows that most of us have done exactly that, and it's all thanks to our dads.

According to scientists from the University of Cambridge, foetuses use the insulin-like growth factor 2 (IGF2) gene, which is inherited from their fathers, to force their mothers to release more nutrients during pregnancy.

According to the scientists behind the research, it's the first evidence that a father's genes allows his unborn child to send these demanding signals.

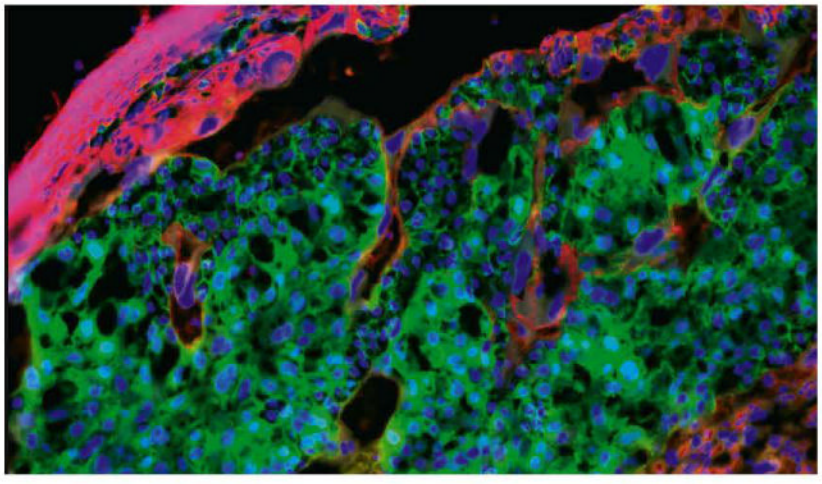
"Genes controlled by the father are 'greedy' and 'selfish' and will tend to manipulate maternal resources for the benefit of the foetuses," said Dr Miguel Constância, a co-senior author of the research.

Paternal genes generally promote foetus growth, whereas those from the mother tend to be more limiting. This means that the greedy signals released by the father's genes kick off an unusual war between the mother and baby.

While the mother's body wants the baby to be healthy, she also needs the same glucose and fats for her own health. These resources will help her deliver the baby, nurse it and then, potentially, have more. But limiting nutrients to the foetus also means the baby isn't too big to come out at the end of the pregnancy.

The research, published in the journal *Cell Metabolism*, was carried out on pregnant mice. The scientists deleted the IGF2 gene in the rodents' placentas. Without the IGF2 gene the mothers didn't make enough of a protein required to grow the foetuses' livers and brains properly.

In the future, the researchers hope that these results could help them develop ways of targeting the placenta to improve the health of mothers and babies.



Placenta cells (in green) carrying the IGF2 gene, which signals the mother to supply nutrients

ASTRONOMY

RARE 'ULTRACOOL' BROWN DWARF STAR FOUND EMITTING RADIO WAVES

Unusual radio signals have led astronomers to a surprising astronomical object

"It's very rare to find ultra-cool brown dwarf stars like this producing radio emissions"

The antennae that form the ASKAP telescope array

It may not be the brightest star, but a brown dwarf is shining for a different reason altogether. Astronomers at the University of Sydney have found the coldest star on record to emit radio waves.

At a mere 425°Cs (797°F), this little ball of gas, known as T8 Dwarf WISE J062309.94–045624.6, is cooler than a typical campfire. The Sun, in comparison, burns at a whopping 5,600°C (10,112 °F).

"Finding this brown dwarf producing radio waves at such a low temperature is a neat discovery," said Kovi Rose, a PhD candidate at the University of Sydney's School of Physics and the lead author of the paper that announced the finding, published in *The Astrophysical Journal*.

According to Rose, "It's very rare to find ultra-cool brown dwarf stars like this producing radio emissions. That's because their dynamics don't usually produce the magnetic fields that generate radio emissions detectable from Earth."

Radio waves can teach us a lot about the composition, structure and motion of astronomical objects. Fewer than 10 per cent of brown dwarfs produce them, however.

The Australian scientists hope that their discovery will deepen our knowledge of ultracool brown dwarfs, including how they evolve and generate magnetic fields.

T8 Dwarf WISE J062309.94–045624.6 lies about 37 light-years from Earth. It's smaller than Jupiter (another rarity for a brown dwarf star), but is between 4 to 44 times more massive than the gas giant in our Solar System. It was originally discovered in 2011 by US astronomers using infrared spectroscopy rather than radio.

This discovery is just one in a series of unusual astronomical objects detected using new data from the Australian Square Kilometre Pathfinder (ASKAP) telescope in Western Australia.

Prof Tara Murphy, a co-author of the paper, said: "As we open this window on the radio sky, we'll improve our understanding of the stars around us and the potential habitability of exoplanet systems they host."

ALAMY X2, SFERRUZZI-PERRI LAB