

Dogs really can smell your fear

Jake Buehler

DOG owners swear that their furry best friend is in tune with their emotions. Now it seems this sense of interspecies connection is real: dogs can smell your emotions, and adopt them as their own.

We already know dogs can see and hear the signs of human emotions, says Biagio D'Aniello at the University of Naples Federico II, Italy. But nobody had studied whether dogs could pick up on olfactory cues from humans.

"The role of the olfactory system has been largely underestimated, maybe because our own species is more focused on the visual system," says D'Aniello. However, dogs' sense of smell is far superior to ours.

D'Aniello and his colleagues tested whether dogs could really sniff out our emotions. First, human volunteers watched videos designed to prompt fear, happiness or a neutral response, and the team collected samples of their sweat.

Next, the researchers presented these odour samples to domestic dogs, and monitored their behaviour and heart rates.

Dogs exposed to fear smells showed more signs of stress than those sniffing happy or neutral smells. They also had higher heart rates, sought more reassurance from their owners, and made less social contact with strangers (*Animal Cognition*, doi.org/cff4).

D'Aniello's study suggests

humans can inadvertently hijack their dogs' emotions by releasing smells. A second study suggests dogs can return the favour, using their expressive faces.

Juliane Kaminski at the University of Portsmouth, UK, and her colleagues have found that dogs' faces are most expressive when they know people are looking at them.

The researchers introduced dogs to a human who was either looking at them or facing away, and either offering food or nothing. The team analysed how

much the dogs' facial movements varied in the four scenarios.

They found that the dogs' facial expressions varied most when the person was looking at them (*Scientific Reports*, doi.org/cff5). Kaminski says there was no sign of a "dinner table effect", which "would predict that dogs try and look super-cute when they want something from the humans".

"This adds to a growing body of evidence suggesting that dogs are very sensitive to human attention," says Kaminski.

It's not clear precisely how dogs visually signal us and how we respond, says Monique Udell of Oregon State University in Corvallis. "This kind of research is needed to fully understand the bidirectional nature of the human-dog relationship."

However, there is evidence that we are susceptible to these signals. Kaminski found that when dogs were being watched, they often raised their eyebrows in a particular way. This eyebrow raise is known to give shelter dogs a better chance of being rehomed. It may make the dogs' eyes look "sad" or infant-like, creating an empathetic response.

It is not clear what role, if any, the domestication of dogs played in creating these behaviours. It has been suggested that dogs' emotional intelligence towards us is a product of the millennia we have spent with them. ■



Puppy-dog eyes

Cannabis cooked up in GM microfactories

CELL-sized cannabis factories could soon be producing medical treatments for epilepsy.

A non-psychoactive compound found in marijuana plants called cannabidiol (CBDV) has shown promise in the treatment of severe cases of epilepsy. However, to treat just 10 per cent of people with epilepsy would require around

1500 tonnes of pure CBDV.

To obtain this amount using current methods, you would need to plant large quantities of marijuana and extract their small supply of CBDV. "There's so little of this chemical in plants it would actually be impossible to harvest it by traditional means," says Kevin Chen, who runs Hyasynth Bio, a start-up in Montreal, Canada.

That's why the firm has turned to cellular agriculture, in which crops are made from cell cultures. It has added the chunk of cannabis DNA that codes for CBDV into yeast DNA, which turns the yeast into CBDV production plants.

This allows for rapid, large-scale CBDV creation with none of the land concerns of growing marijuana. The work was presented at the New Harvest conference in New York this month.

Once optimised, using microbes like yeast will make harvesting compounds such as CBDV efficient and cost-effective, says Tom Williams at Macquarie University in Australia.

"Adding part of cannabis DNA to yeast allows the yeast to become a production plant"

The medical applications could be far-reaching. Epilepsy affects around 50 million people worldwide and those diagnosed with it are three times more likely to die prematurely. Around 30 per cent of those with epilepsy don't respond to available treatments.

GW Pharmaceuticals is conducting clinical trials on CBDV treatments, and Chen says several pharmaceutical companies have been in touch with Hyasynth Bio.

Chen says the firm is also open to moving into the recreational marijuana field. Mallory Locklear ■