Brains Contain 'Celebrity Cells'

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Camera-toting paparazzi have no trouble spotting Jennifer Aniston or Brad Pitt – even behind dark sunglasses or a new hairstyle. Now scientists have found that part of this instant recognition may involve individual brain cells.

Scientists are intrigued that we can quickly identify people or objects no matter what angle we view them or how they look that day. They've suspected that certain neurons are specialized to be on the lookout for a single thing in this world.

This is sometimes mockingly referred to as the "grandmother cell" theory because – taken to its extreme – it says that all the concepts and perceptions regarding your dear old grandma can be embodied in one neuron.

Turns out the idea may not be all that silly.

In the current issue of the journal Nature, a research team led by neuroscientists at UCLA and Caltech has rather haphazardly located a neuron that "looks for all the world like a Jennifer Aniston cell," writes Charles Connor of Johns Hopkins University. Connor was not involved in the study.

Not Brad Pitt, though

The cell in question was found in the brain of one subject as part of an epilepsy study. When the person was shown 87 images of various celebrities, well-known buildings, animals and objects, the neuron only fired for seven separate snapshots of the Friends actress.

"The neuron responds to Jennifer Aniston but not to Julia Roberts, even though these women are somewhat similar both visually and conceptually," Connor told LiveScience in a telephone interview.

Interestingly, this same neuron was not excited when Aniston was pictured with husband Brad Pitt, whom she is now divorcing.

But this was not the only case of a person-specific neuron. In another patient, the activity of a single neuron was

tied to Halle Berry. Not only did pictures of the actress elicit a response but so did other representations: a drawn caricature, images of Berry in her "Catwoman" costume, and even the spelling of her name.

In a third subject, images of the Sydney Opera House, as well as the words "Sydney Opera," caused a group of neurons to fire. Other buildings and words, like "Eiffel Tower," did not have the same response.

These experiments were part of a study to localize the seizures in eight patients with epilepsy. The subjects consented to having electrodes implanted in their brains to record the signals of individual neurons.

In separate sessions, the patients were exposed to a random assortment of about 100 images, while the electrodes monitored the activity of around 50 neurons in the medial temporal lobe, a small region of the brain associated with memory.

Only about 3 percent of the pictures struck a chord in one of the neurons. These "hits" were later explored in a follow-up session, in which pictures and words related to the initial stimulus were shown to the patient.

How selective

The researchers found that the neurons were selective (not firing for related subject matter) and invariant (firing for entirely different representations of the same person or thing).

However, no one is claiming that there is only one cell in the brain for Jennifer Aniston, the Eiffel Tower, and your grandmother.

"One straightforward objection to this idea is that we don't have enough neurons in the brain to represent each object in the world," said Connor.

But these findings do seem to imply that the brain keeps abstract concepts in a sparse number of neurons – as opposed to spreading out this information.

"Sparseness has its advantages, especially for memory, because compact coding maximizes total storage capacity," Connor said.

This extra space will come in useful as a new crop of sitcoms – and new celebrity faces to recognize – should be coming out this fall.

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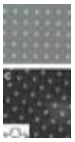
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