Hospital del Mar Research Institute Barcelona

PRESS RELEASE

The way we remember is the basis of human intelligence

- ***In an article published in the journal Neuron, Dr. Rodrigo Quian Quiroga proposes that the way we organize our memories constitutes the mechanism that gives rise to human intelligence.***
- ***The human brain generates memories from the representation of the stimuli it receives, endowing them with meaning. This is a mechanism of abstraction that does not merely store information.***
- ***Published scientific evidence indicates that this mechanism is not found in other animal species, suggesting that it is a key element in the construction of our intelligence.***

Barcelona, May 12th, 2026 – "***The human brain, rather than simply remembering, seeks to understand.***" This is how Dr. Rodrigo Quian Quiroga, coordinator of the Research Group on Neuronal Mechanisms of Perception and Memory at the Hospital del Mar Research Institute, describes it, pointing to this way of functioning as "***the exact mechanism that gives rise to human intelligence.***" He does so in an article recently published in the journal *Neuron*, in which he reviews two decades of research on how the human brain works and the scientific evidence published in this field.

Based on the discovery of so-called concept neurons, also known as Jennifer Aniston neurons, Dr. Quian Quiroga argues that our way of generating memories is completely different from that of other animal species. The discovery of these neurons, through studies with patients in which the reactions of individual neurons were monitored by means of implanted electrodes, made it possible to determine that they **are specialized and react only to specific stimuli,** such as a photograph of the well-known actress.

In the case of the human brain, what it does is store memories, the basis of thoughts. And it does so through a unique process that differs from that followed by other animals, despite the physical similarities in brain structure with some species. In apes and other vertebrates, the stimulus is stored directly in the hippocampus, the part of the brain dedicated to this function. In humans, the mechanism is different and slower, since there is a circuit in which meaning is assigned to the stimulus. "***We process concepts, not photographs,***" explains Dr. Quian Quiroga. In other words, "***the human brain does not work directly with that stimulus, but with the meaning it attributes to it. In this way, it stores abstract concepts, which gives us a much greater cognitive capacity than if we thought in terms of the stimulus we receive,***" he states.

In the new article, Quian Quiroga points out that this capacity is what distinguishes humans from animals and is the mechanism underlying human intelligence. It is what enables us **to identify a given concept in different images**, even when they represent that concept in different ways.

Evolution through language

Another particular aspect highlighted in the article is the importance of language in the development of this more abstract type of memory. Human beings are the only animals capable of expressing themselves with words that represent concepts, a fact that has shaped the evolution of our brain. ***"Human beings have evolved cognitively over thousands of years through the use of language, which leads them to think in words rather than in images. By thinking in terms of words, they have a more conceptual representation, something that is reflected in the existence of concept neurons, which respond only to one specific concept."***

Dr. Quian Quiroga concludes that his experience leads him to ***"revisit theories on how memory works.***" Memory does not merely store recollections so they can later be retrieved; rather, it reconstructs and creates stories from fragments of information. **"The neurons we have discovered over twenty years of research do not faithfully encode stimuli; instead, they do so in an abstract way, allowing us to have higher cognitive abilities, make analogies, draw inferences, and think in depth."** This mechanism enables a deeper and more abstract capacity for remembering, but one that is less faithful to lived reality. **"We forget in order to remember because we understand what happens to us,"** concludes Dr. Quian Quiroga.

Reference article

Rodrigo Quian Quiroga, *20 years of concept cells: From invariant responses to a unique coding of human memory*, *Neuron*, 2026, ISSN 0896-6273, https://doi.org/10.1016/j.neuron.2026.01.026.

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