Learning how rats escape from cats also reveals how a storm of electrical pulses sweeping across the brain is translated into information

SEEKING the

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As the computer-controlled sliding doors suddenly opened, revealing a pitch-dark but already familiar chamber, Eshe did exactly what was expected of her after all those demanding weeks of training. Without hesitation—and most likely counting on the reward she was certain to receive given her superb performance of late—she lunged into the narrow room moving at full speed toward the opposite wall. She was ready to show off her skills.

The trial started the moment Eshe crossed an infrared light beam in front of an aperture positioned directly in her running path. The opening, flanked by the small arms of two T-shaped metal bars protruding from each side of the chamber, defined a slot through which Eshe had to pass to reach the opposite wall. Her job was far from trivial: in total darkness she had to estimate, in a single attempt, the aperture's diameter as quickly as possible. To make things more complicated and interesting, the opening's size varied randomly from trial to trial. Without being able to see the bars, Eshe had only one way to achieve her goal—she had to rely entirely on her exquisite sense of touch.

Amazingly, even when the aperture's diameter varied by only a couple of millimeters, Eshe could correctly discriminate in 90 percent of trials whether it was narrower or wider than before. And she solved this tactile riddle in barely 150 milliseconds by touching the edges of both bars with only the tips of the prominent long hairs that sprouted from both sides of her face. From a human perspective, Eshe's trick was no small feat. Anyone trying to solve a similar task by applying a mustache or beard to the same aperture would have failed miserably.

But Eshe was a rat, and the base of each of her whiskers contained a very high density of specialized peripheral sensory organs, known as mechanoreceptors, which translate the main