

## What's that smell? How our brains detect and cope with all the odors we encounter

Olfactory neurons in your nose have evolved some [400 odor receptors](#), and each neuron contains only one. Receptors are tuned to detect a few basic odors apiece: some detect geranium petals or pine needles, while others detect the by-products of putrefaction. To organize all this information, your olfactory neurons wire into an “olfactory map” on your brain’s olfactory bulb.

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[A]ccording to a [study published recently in Science](#), it is what the odor receptors don’t smell that guides them.

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Working in mice—which have more than 1,000 odor receptors—the study’s authors showed that each receptor, in the absence of an odor, produces a specific type of electrical noise.

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These noise events then exquisitely control the set of genes directing an olfactory neuron’s growth as it wires to the olfactory map. Because two neurons with the same odor receptor will experience very similar noise, they will end up wiring to the same place. And because all 400 of your receptors are different—if only slightly—the noise they produce is different, too, causing them to wire to distinct locations. The end result is a 400-location map that functions like the [perfumer’s organ](#) equivalent of the “[The Library of Babel](#).”

**Read full, original post:** [How We Are Wired for Smell](#)