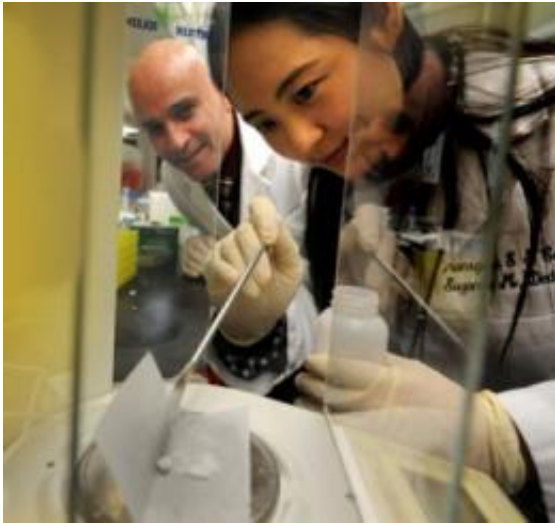


Lipid helps cells find their way by keeping their 'antennae' up

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A lipid that helps lotion soften the skin also helps cells find and stay in the right location in the body by ensuring they keep their “antennae” up, scientists report. Credit: Phil Jones

A lipid that helps lotion soften the skin also helps cells find and stay in the right location in the body by ensuring they keep their "antennae" up, scientists report.

Each cell has an antenna, or cilium, that senses the environment then determines where to go and what to do when it arrives, said Dr. Erhard Bieberich, biochemist at the Medical College of Georgia at Georgia Health Sciences University.

"A cell is blind; it does not see, it does not feel; it doesn't know where it is," Bieberich said. "It needs to have an organelle that senses where it is in space in order to go where it wants and needs to go."

That kind of direction helps keep [brain cells](#), for example, from wandering off to the feet and vice versa. It's enabled by [growth factor receptors](#) on the antennae that are attracted to growth factors secreted by cells that already have found their way. Once cells are situated, the antennae help them respond to nearby signals, such as helping [kidney cells](#) sense when to void, said Bieberich, corresponding author of the study in *Molecular Biology of the Cell*.

His team has shown that the lipid ceramide helps cells keep this organelle or antenna from retracting by inhibiting the enzyme, histone deacetylase 6 or HDAC6.

Antennae must retract for cells to divide and activating HDAC6 enables that occasional necessity, such as during development or when more skin or gastrointestinal cells are needed to replace normal turnover.

Interestingly, some of the most rapidly dividing cells, [cancer cells](#), "abuse" HDAC for their purposes; they also suppress ceramide, which is known to induce [cell suicide](#), Bieberich said.

Ceramide is really quite the multi-tasker. Bieberich's team reported in 2007 in the [Journal of Biological Chemistry](#) that in the earliest days of development, it helps orient stem cells to which way is up and find their place in a lineup that is important for the genesis of an embryo. Three years earlier the scientists showed the lipid teams up with the protein PAR-4 to eliminate useless cells in developing brains.

Provided by Georgia Health Sciences University

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