tions caught the eye of David Glanzman, a neurobiologist at U.C.L.A., who set out to study the process in *Aplysia*, a slug-like mollusk commonly used in neuroscience research. Glanzman and his team zapped *Aplysia* with mild electric shocks, creating a memory of the event expressed as new synapses in the brain. The scientists then transferred neurons from the mollusk into a petri dish and chemically triggered the memory of the shocks in them, quickly followed by a dose of propranolol.

Initially the drug appeared to confirm earlier research by wiping out the synaptic connection. But when cells were exposed to a reminder of the shocks, the memory came back at full strength within 48 hours. “It was totally reinstated,” Glanzman says. “That implies to me that the memory wasn’t stored in the synapse.” The results were recently published in the online open-access journal *eLife*.

If memory is not located in the synapse, then where is it? When the neuroscientists took a closer look at the brain cells, they found that even when the synapse was erased, molecular and chemical changes persisted after the initial firing within the cell itself. The engram, or memory trace, could be preserved by these permanent changes. Alternatively, it could be encoded in modifications to the cell’s DNA that alter how particular genes are expressed. Glanzman and others favor this reasoning.

Eric R. Kandel, a neuroscientist at Columbia University and recipient of the 2000 Nobel Prize in Physiology or Medicine for his work on memory, cautions that the study’s results were observed in the first 48 hours after treatment, a time when consolidation is still sensitive. Though preliminary, the results suggest that for people with PTSD, pill popping will most likely not eliminate painful memories. “If you had asked me two years ago if you could treat PTSD with medication blockade, I would have said yes, but now I don’t think so,” Glanzman says. On the bright side, he adds, the idea that memories persist deep within brain cells offers new hope for another disorder tied to memory: Alzheimer’s.

—Roni Jacobson

**AUTOMOTIVE**

**Driverless Tech Inches Ahead**

Today’s safety features foreshadow the robotic cars of tomorrow

**In the world** of self-driving cars, all eyes are on Google. But major automakers are making moves toward autonomous driving, too. Although their advanced-safety and driver-assistance features may seem incremental in comparison, many are proofs of concept for technologies that could one day control driverless cars. At the same time, the National Highway Traffic Safety Administration (NHTSA), the arm of the Department of Transportation charged with establishing and enforcing car-safety standards and regulations, is studying and testing the road readiness of these control and machine-vision systems. In the short term, as buyers hold their breath for robotic cars, making automation features standard will save lives.

—Corinene Iozzo

Mercedes-Benz plans to study self-driving capabilities with its F 015 Luxury in Motion.

**4 AUTONOMOUS FEATURES GOING STANDARD**

**FORWARD COLLISION AVOIDANCE**

In January the NHTSA announced that it would begin to factor crash-preventing braking systems into its car-safety ratings. The systems use forward-facing sensors—which can be radar-, camera- or laser-based—to detect imminent collisions and either apply or increase braking force to compensate for slow or insufficient driver reactions. Honda was first to introduce such a system in 2003; since then, nearly every automaker has rolled out similar features on high- and mid-range models.

**VEHICLE-TO-VEHICLE COMMUNICATION**

For self-driving cars to navigate roads en masse, each must have the position, speed and trajectory of nearby automobiles. Last summer the NHTSA announced that it would explore how to standardize such vehicle-to-vehicle communication. The feature could improve coordination for human and machine alike during accident-prone maneuvers, such as left-hand turns.

**LANE DETECTION**

In 2013 the NHTSA established how to test the effectiveness of camera systems that watch existing painted lane markers and alert drivers if they drift. Some cars, such as the Toyota Prius, now even take over steering if a driver does not respond quickly enough to warning signals. And new 2015 models from Mercedes-Benz and Volkswagen go further, using cameras and sensors to monitor surroundings and autonomously steer, change lanes and swerve to avoid accidents.