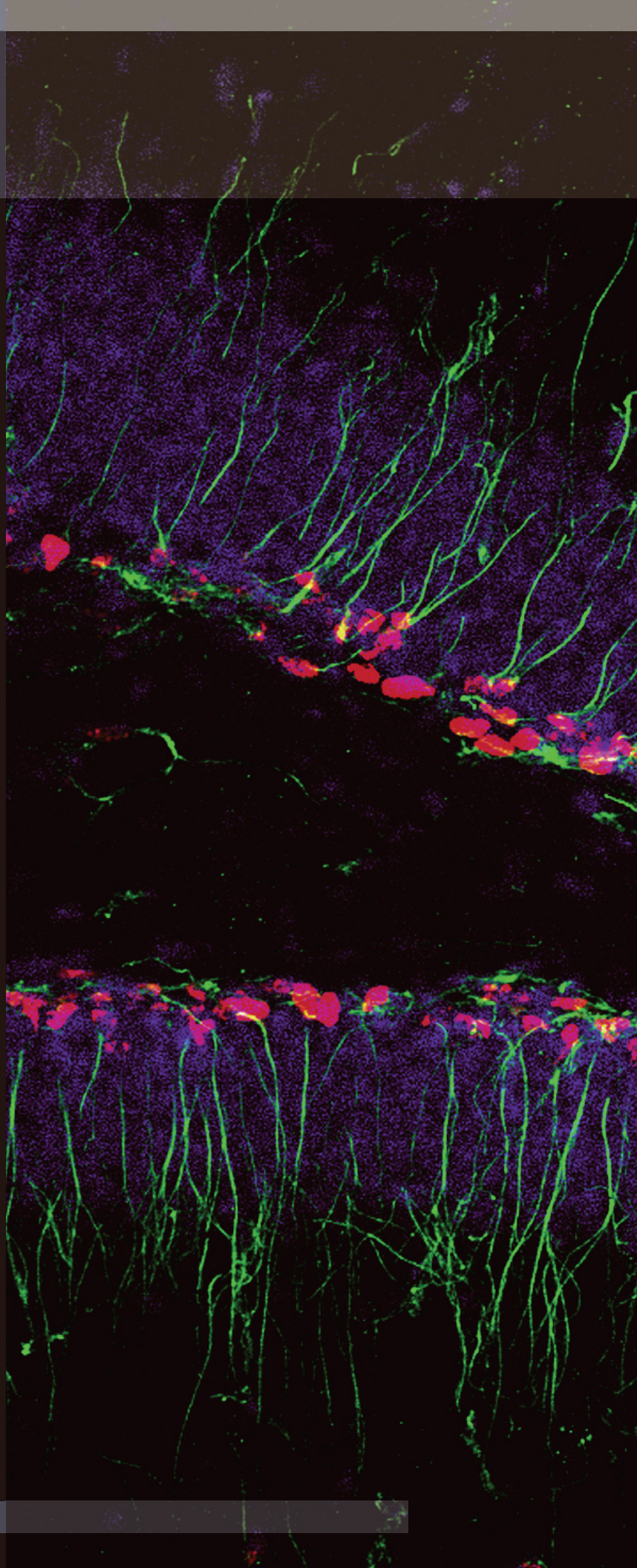


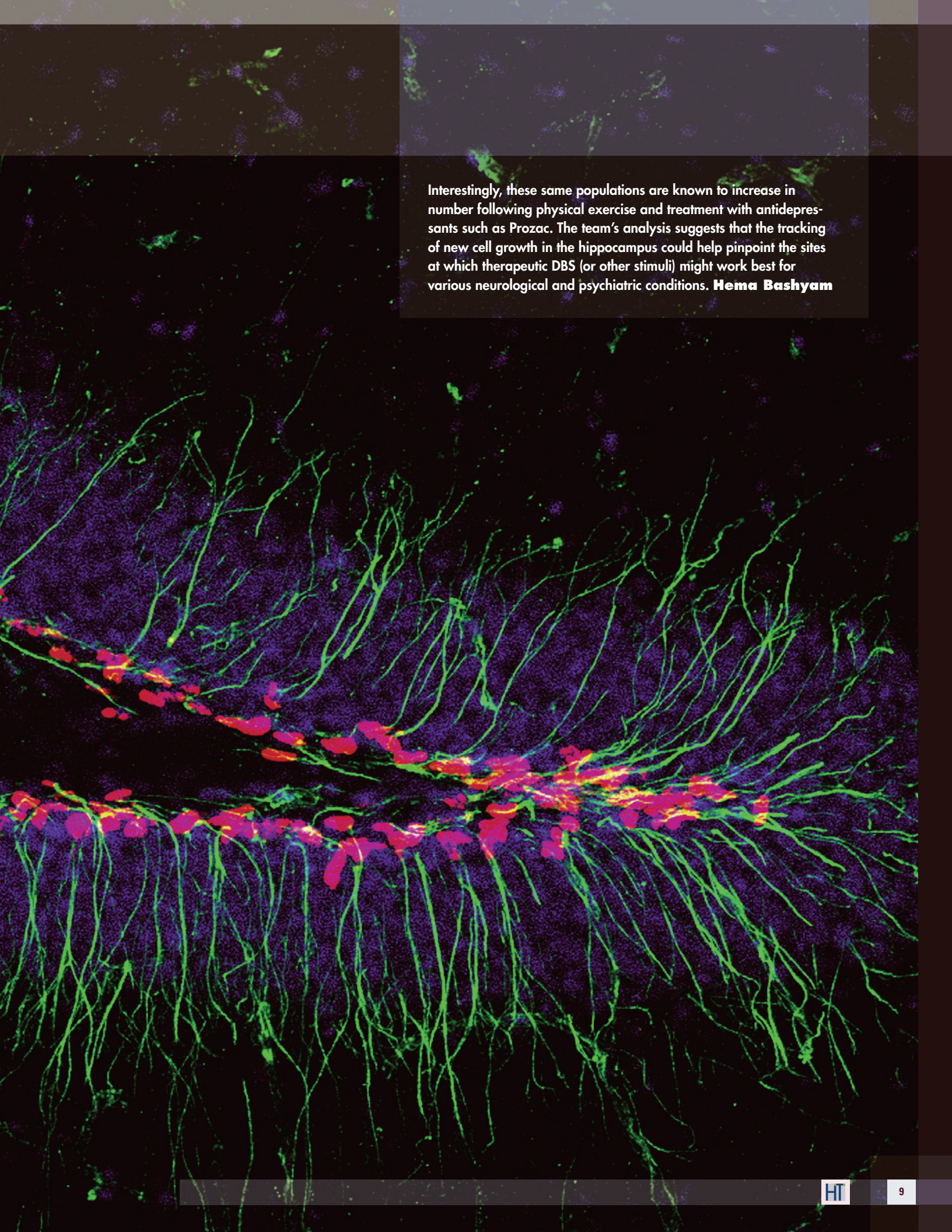
One experiment

Deep brain stimulation (DBS)—which involves shooting steady pulses of electricity through slender, implanted electrodes—acts like a pacemaker in the brain. It greatly reduces the tremors, stiffness and movement problems that are characteristic of Parkinson's disease, and works against other brain disorders such as epilepsy and severe depression, as well. CSHL's Dr. Grigori Enikolopov recently teamed up with neurosurgeons in Canada to examine the effect of DBS on the hippocampus—the brain's control center for spatial and long-term memory, emotion, behavior and other functions that go awry in these diseases.

Enikolopov's group developed new mouse models in which neural stem and progenitor cells in the adult brain produce a fluorescent color. This enabled the scientists to visually track these cell populations and quantitatively assess how they change in response to neuronal triggers such as DBS.

In one experiment, Enikolopov and his collaborators stimulated an area in the mouse brain equivalent to a human brain area where DBS is therapeutically applied. The result was an increase in the number of new neurons due to an increase in cell division in the hippocampus, specifically among neural stem and progenitor cells (seen as red dots). More primitive stem cells are also identified by their green radial strands.





Interestingly, these same populations are known to increase in number following physical exercise and treatment with antidepressants such as Prozac. The team's analysis suggests that the tracking of new cell growth in the hippocampus could help pinpoint the sites at which therapeutic DBS (or other stimuli) might work best for various neurological and psychiatric conditions. **Hema Bashyam**