



During the 20th century, the techniques for studying brain activity in humans and primates diverged. In humans, brain activity is measured from electrodes placed outside the skull, a technique that has allowed researchers to probe a range of questions but has led to little insight on neural mechanisms. In animals, scientists have been able to make recordings from inside the brain—even from individual neurons—but it has not been clear how applicable these findings have been to what happens inside the human brain. Woodman has been working to unite these two techniques, combining intracranial recording in monkeys with scalp recordings, bridging the gap between primate and human studies.

Woodman has also made discoveries at the forefront of research on learning and memory. Recently he discovered what might be thought of as an electric “thinking cap.” The cap applies a mild electrical stimulation to the medial frontal cortex—a part of the brain involved in cognitive control and error processing. After Woodman and his colleagues applied this stimulation to the brain of a volunteer, the subject made fewer mistakes and learned more from those mistakes than when they were given a sham treatment. The effects lasted for some five hours. These findings have implications that go beyond improved learning. Woodman and his team have performed similar research on patients with schizophrenia, a disorder for which there are few effective treatments. They found that the technique could restore error-monitoring—the brief, important pause healthy people make after making a mistake—which is impaired in those with schizophrenia.