

Research: A Reality Check

Published on: August 10, 2026 | By: Dzongkar Choede Monastery

Summary: Over the past twenty years neuroscientists have studied experienced Tibetan practitioners, and the results are unusual enough to be worth reporting carefully. A 2004 study at Wisconsin found long-term meditators with 10,000 to 50,000 hours of practice producing gamma synchrony at amplitudes not previously reported, present even at rest; a later study of 73 monks found changes reaching past the brain into heart rate and blood proteins; and a 2024 study at Sera Jey — the university whose curriculum Dzongkar Choede follows — found analytical meditation almost invisible to EEG. The literature also disagrees with itself, and the samples are small. Matthieu Ricard, the monk most associated with this work, calls the label the press gave him absurd. The practice does not depend on any of it.

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Meditation was practised for two and a half thousand years before anyone attached an electrode to a practitioner. What the instruments have found in the past twenty years is interesting, and this page sets it out — along with the reasons for holding it lightly.

Wisconsin, 2004

In 2004 Antoine Lutz, Richard Davidson and colleagues at the University of Wisconsin-Madison published a study of long-term Buddhist practitioners with between 10,000 and 50,000 hours of practice behind them. Asked to meditate on unconditional compassion, the practitioners produced high-amplitude gamma-band oscillations and phase synchrony across lateral frontoparietal electrodes, at amplitudes not previously reported in the literature. The effect increased with hours practised, and the practitioners' gamma-to-slow-wave ratio was already higher than the controls' before meditation began — the difference showed at rest, not only during practice.

The Monk with the Sensors

The best-known participant is Matthieu Ricard, who took a doctorate in molecular genetics at the Pasteur Institute under the Nobel laureate François Jacob, and then in 1972 left science for the Himalayas. He has been the Dalai Lama's French interpreter since 1989, co-founded the

humanitarian organisation Karuna-Shechen in 2000, and gives away the proceeds of his books.

Wired with 256 sensors, Ricard produced gamma activity that led the press to call him the happiest man in the world. He has called that label absurd, and says it misrepresents both the research and his experience. He is right, and the reasons are worth stating: a measurement is not a mood, one person is not a result, and a tradition that treats the self as its central problem has no use for a title awarded to an individual.

Sera Jey, 2024

In 2024 researchers brought portable EEG to Sera Jey Monastic University in Bylakuppe — the institution whose curriculum Dzongkar Choede follows — and recorded twenty-three monks across thirty-five sessions: nine beginners, six with one to ten years of practice, eight with more than ten years including extended retreats.

Concentrative meditation produced power changes of up to fifteen decibels in the most experienced monks, with a marked shift in the alpha peak that the researchers read as active inhibition. Analytical meditation produced around two decibels, and the researchers concluded it engages processes less visible to this kind of analysis. The practice that most resembles ordinary thinking is the one the instruments find hardest to see.

The Wider Picture

Between those two studies sit a number of others. The largest recorded 73 Tibetan Buddhist monks against 30 meditation-naïve controls, taking EEG and ECG together and drawing blood for proteomic analysis. Activity shifted to higher frequencies during meditation, and the state-level changes correlated with lasting differences in heart rate and in levels of the protein neuropilin-1 — an effect reaching past the brain into cardiovascular and molecular measures.

Other work has found that the difference persists into sleep: experienced meditators show higher parietal-occipital gamma during dreamless NREM sleep than non-meditators do. And studies of brain-heart interaction in Tibetan monks have found the neural response to the heartbeat itself modulated during practice.

Where the Findings Disagree

It would be convenient to report that the literature converges. It does not. Against the studies showing gamma increasing during meditation, other work on long-term practitioners has found a consistent and significant decrease in relative gamma, and reduced beta and low-gamma power during deeper absorption.

The explanation offered is that results depend on which practice is being done, how deep the state is, which region is measured, and which frequency band is examined. Which means the popular summary — meditation raises gamma — is too crude to be true. Different practices do different things.

That is less satisfying than a clean story, and more credible. It also matches what the tradition itself says: concentrative and analytical meditation are not the same activity, and there is no reason to expect them to leave the same trace.

What These Studies Do Not Show

In 2018 a large group of contemplative researchers published a critical review of their own field, arguing that poor measurement, weak methodology and the hyping of unreplicated findings had outrun the evidence, and that the field needed to take the replication crisis seriously.

The studies described here have small samples — twenty-three monks, and in the Wisconsin work fewer still. They describe people with tens of thousands of hours of practice, which says little about what a beginner should expect. They measure correlates, not causes. And meditation is not uniformly benign; adverse effects exist and are under-reported.

None of that makes the findings worthless. It makes them what they are: early results, in small numbers of unusual people, pointing somewhere interesting.

Why the Monastery Reports This Carefully

There is an obvious temptation for a monastery to use this research as advertising. We would rather not. The monks here did not take up this practice because of an EEG result, and they would continue if every study were retracted tomorrow.

What the research offers is a common language — a way for people who find the traditional vocabulary difficult to see that something is being trained here, and trained systematically. That is worth having. It is not the reason for the practice.