Diffusion tensor imaging (DTI) shows that the white matter in the cingulum bundle (CB) is abnormal in a variety of psychiatric disorders, including depression, obsessive-compulsive disorder (OCD), and schizophrenia. Imaging the CB is an effective way to reveal underlying structural anomalies in psychiatric disorders. The CB is a collection of fibers positioned longitudinally and transversely to the longitudinal axis, making it a prime target for neurosurgical treatment. Traditionally, the CB has been closely associated with the cingulate cortex. However, recent studies show that the CB is involved in many other brain regions.

At the splenium, the CB courses ventrally and curves back under the corpus callosum. Delineate serotonergic, dopaminergic, and cholinergic trajectories through the CB to understand how the CB is organized with respect to specific cingulate pathways.

The CB is closely linked with the indusium griseum, a small piece of gray matter resting between the cingulate and corpus callosum. Subcortical fibers travel extensively within the CB before terminating in the corpus callosum and the cingulate.

CONCLUSIONS
Fibers originating or terminating in cingulate cortices pass through the CB, but many of these do not actually pass through the CB. Fibers that pass through the CB include ascending, descending, and some corticofugal fibers. Fibers that travel long distances within the CB include a cortical and subcortical fibers that terminate at specific points in the cingulate cortex, and corticofugal fibers that terminate at specific points in subcortical and striatal cortices. The CB is a critical target for neurosurgical treatment in psychiatric disorders.

METHODS
Injections of bidirectional neural tracers (FR, FS, and LY) and anterograde tridiated amino acid (AA) were placed in cingulate cortex areas 24b/c and 31, vmPFC (areas 14 and 32), dPFC (areas 9 and 46), and the nucleus basalis of macaques. Other tissue was processed for tyrosine hydroxylase (TH) or serotonin transporter (SERT) immunocytochemistry to show dopaminergic and serotonergic pathways to terminate above the cingulate cortex.

In interpreting DTI and cingulotomy results, the CB should not be considered interchangable with adjacent cingulate cortices. Key regions in CB regions include a wide range of passing fibers that neither originate nor terminate in nearby cingulate.

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