

Diffusion MRI fibre track

The present study tested the validity of dividing this tract into subdivisions corresponding to the 'parahippocampal', 'retrosplenial', and '[subgenual cingulate gyrus](#)' portions of the cingulum. These three cingulum subdivisions occupied different medial-lateral locations, producing a topographic arrangement of cingulum fibres. Other comparisons based on these different reconstructions indicate that only a small proportion of the total white matter in the cingulum traverses the length of the tract. In addition, both the radial diffusivity and fractional anisotropy of the subgenual subdivision differed from that of the retrosplenial subdivision which, in turn, differed from that of the parahippocampal subdivision. The extent to which the radial diffusivity scores and the fractional anisotropy scores correlated between the various cingulum subdivisions proved variable, illustrating how one subdivision may not act as a proxy for other cingulum subdivisions. Attempts to relate the status of the cingulum, as measured by MRI-based fibre tracking, with cognitive or affective measures will, therefore, depend greatly on how and where the cingulum is reconstructed. The present study provides a new framework for subdividing the cingulum, based both on its known connectivity and MRI-based properties ¹⁾.

¹⁾

Jones DK, Christiansen KF, Chapman RJ, Aggleton JP. Distinct subdivisions of the cingulum bundle revealed by diffusion MRI fibre tracking: implications for neuropsychological investigations. *Neuropsychologia*. 2013 Jan;51(1):67-78. doi: 10.1016/j.neuropsychologia.2012.11.018. Epub 2012 Nov 23. PubMed PMID: 23178227; PubMed Central PMCID: PMC3611599.

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