

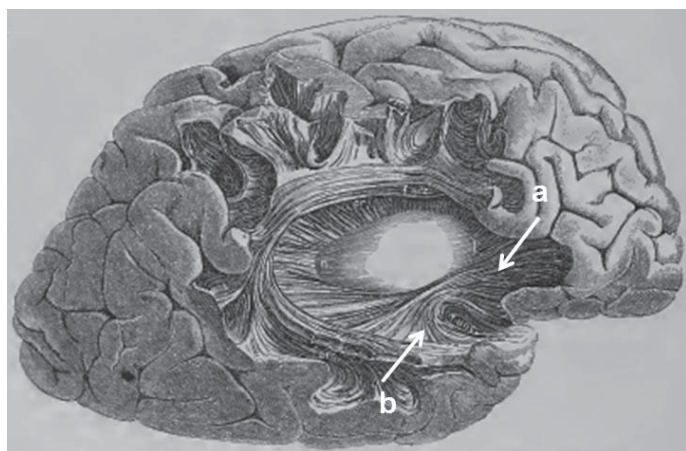
# The uncinete fascicle: from real to virtual dissection

## O fascículo uncinado: da dissecação real para a virtual

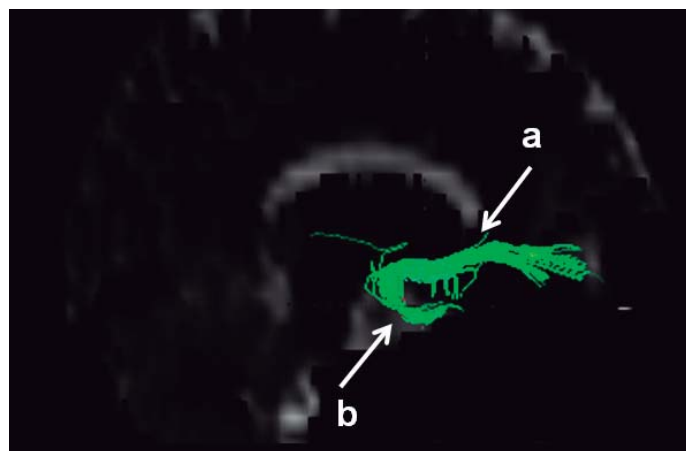
Elias Engelhardt<sup>1,3</sup>, Denise Madeira Moreira<sup>2</sup>, Felipe Kenji Sudo<sup>3</sup>, Gilberto Sousa Alves<sup>4</sup>, Júlio César Vasconcelos da Silva<sup>3</sup>, Jerson Laks<sup>3,5</sup>

The uncinete fascicle (*Fasciculus uncinatus*) is an assemble of bidirectional fibers associated to the limbic system. It is a hook-shaped bundle, arcing around the Sylvian fissure, and connecting the anterior temporal and the frontal lobes. It may be divided into three segments - a frontal (lateral orbital and polar), a middle (insular), and a temporal (uncal, entorhinal, perirhinal, anterior and polar). The uncinete fascicle has been implicated in psychiatric and neurological disorders, being related to memory, language and social-emotional processing<sup>1,2</sup>. This fascicle was

first defined by Reil (*haakenförmige Markbündel*) (1809), as acknowledged by Burdach, who renamed (*Hakenbündel*), fully described and depicted the bundle (1822)<sup>3</sup>. A clear macrodissection of the tract (*Fasciculus uncinatus* – Fig. 19) was produced by Meynert<sup>4</sup> (Figure 1). The first studies of the bases for the tractography technique appeared in 1992, and virtual dissection was implemented in the following years<sup>5</sup>. A tractographic study of the uncinete fascicle is here presented (Figure 2).



**Figure 1.** Meynert's "real dissection" of the human brain (Meynert, 1884 - Figure 19).<sup>4</sup> Arrows point to two segments of the uncinete fascicle: a=frontal, b=temporal, both connected by the intermediate (not labeled).



**Figure 2.** Uncinete fascicle tractography - a "virtual dissection" (adapted from Engelhardt and Moreira, 2008, with permission of the RBN [2008;44(4):19-34]). Arrows point to two of its segments: a=frontal, b=temporal, both connected by the intermediate (not labeled).

<sup>1</sup>Cognitive and Behavioral Neurology Unit - INDC/CDA-IPUB-Institute of Psychiatry - UFRJ;

<sup>2</sup>Neuroradiology Unit - INDC/UFRJ; Radiology Service PróCardíaco Hospital-Rio de Janeiro;

<sup>3</sup>Center for Subjects with Alzheimer's Disease and Related Disorders (CDA) - IPUB/UFRJ;

<sup>4</sup>Department of Internal Medicine, Federal University of Ceará, Fortaleza;

<sup>5</sup>Postgraduate Program in Translational Biomedicine - Biotrans, Unigranrio University, Brazil.

**REFERENCES**

1. Catani M, de Schotten MT. A diffusion tensor imaging tractography atlas for virtual in vivo dissections. *Cortex* 2008;44:1105-1132.
2. Von Der Heide RJ, Skipper LM, Klobusicky E, Olson IR. Dissecting the uncinata fasciculus: disorders, controversies and a hypothesis. *Brain* 2013;136:1692-1707.
3. Burdach KF. Von Baue und Leben des Gehirns. Band 2. Leipzig: Dyk, 1822, p 152. [Retrieved from: <http://www.biusante.parisdescartes.fr/histoire/medica/resultats/?cote=06505x02&do=pdf>]
4. Meynert TH. Psychiatrie. Klinik der Erkrankungen des Vorderhirns. Wien: W. Braumüller, 1884, p 40. [Retrieved from: <http://www.archive.org/details/psychiatrieklini00meyn>]
5. Filler A. The History, Development and Impact of Computed Imaging in Neurological Diagnosis and Neurosurgery: CT, MRI, and DTI. *Internet J Neurosurg* 2009; 7(1):1-37. [Retrieved from: <http://print.ispub.com/api/0/ispub-article/12184>]