

## Morphometric analysis of the inferior olivary complex in infants and adults

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### SUMMARY

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In the literature, few studies detailed morphometric parameters of the inferior olivary complex, and mainly applying biased methods based on counting in a two-dimensional plane. In the present work, the unbiased quantitative method of the optic disector was applied in order to analyse neuronal densities, nuclear volumes and total neuron numbers of the principal (PION), medial (MION) and dorsal (DION) nuclei of the inferior olivary complex in adults (16 male, 6 female; mean age: 37 years) and infants (5 male, 5 female; mean age: 5 months). In both adult and infant series, statistically significant differences were not found in neuronal densities between the various inferior olivary nuclei. All the nuclei showed higher volumes and lower neuronal densities in adults than infants, without statistically significant differences in total neuron numbers, thus suggesting postnatal development of the neuropil.

### INTRODUCTION

The inferior olivary complex belongs to the brainstem precerebellar nuclei, such as the pontine, arcuate and vestibular nuclei, receives ascending and descending afferent fibres and projects to the cerebellum. It comprises the principal inferior olivary nucleus (PION) and the medial (MION) and dorsal (DION) accessory olivary nuclei (Fig. 1). Ascending crossed fibres comprise the spino-olivary tracts; descending ipsilateral fibres origin from the cerebral cortex, thalamus, basal nuclei, red nucleus and central gray of the midbrain. In particular, olivary projections from red nucleus and central gray of the midbrain comprise the central tegmental fasciculus. Efferent fibres are the climbing fibres for the Purkinje cells in the cerebellum