

# Evolutionary plasticity of habenular asymmetry with a conserved efferent connectivity pattern

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The vertebrate habenulae (Hb) is an evolutionary conserved dorsal diencephalic nuclear complex that relays information from limbic and striatal forebrain regions to the ventral midbrain. One key feature of this bilateral nucleus is the presence of left-right differences in size, cytoarchitecture, connectivity, neurochemistry and/or gene expression. In teleosts, habenular asymmetry has been associated with preferential innervation of left-right habenular efferents into dorso-ventral domains of the midbrain interpeduncular nucleus (IPN). However, the degree of conservation of this trait and its relation to the structural asymmetries of the Hb are currently unknown. To address these questions, we performed the first systematic comparative analysis of structural and connectional asymmetries of the Hb in teleosts. We found striking inter-species variability in the overall shape and cytoarchitecture of the Hb, and in the frequency, strength and to a lesser degree, laterality of habenular vol