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## IN VIVO MOLECULAR IMAGING REVEALS DISTINCT DISTRIBUTIONS OF THE SEROTONIN TRANSPORTER, THE MAJOR INHIBITORY AND EXCITATORY SEROTONIN RECEPTORS

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**Introduction:** Based on evidences in molecular neuroimaging, postmortem and genetic studies, impaired serotonergic neurotransmission has been implicated with affective disorders. Moreover, a growing number of evidences showed strong interrelations within the serotonergic system suggesting a common mechanism in the modulation of receptor and transporter densities.

**Objective:** Here we directly investigated the regional expression of the 5-HT<sub>1A</sub>, 5-HT<sub>2A</sub> and 5-HTT using PET and the three highly selective and specific radioligands [carbonyl-<sup>11</sup>C]WAY-100635, [<sup>18</sup>F]Altanserin and [<sup>11</sup>C]DASB in healthy subjects.

**Methods:** A total of 55 healthy subjects (5-HT<sub>1A</sub>: 36 subjects, 18 males, age=26.0±4.9; 5-HT<sub>2A</sub>: 19 subjects, 11 males, age=28.2±5.9; 5-HTT: 8 males, age=28.12±3.6) were included in this study. Binding potential (BP<sub>ND</sub>) values were quantified according to the AAL parcellation scheme.

**Results:** BP<sub>ND</sub> values averaged over both hemispheres ranged from 0.40-6.35 for the 5-HT<sub>1A</sub> receptor; 0.01-2.01 for the 5-HT<sub>2A</sub> receptor and 0.09-2.05 for the 5-HTT, respectively. There was a specific topological pattern according to the ratio between the 5-HT<sub>1A</sub>, 5-HT<sub>2A</sub> receptors and 5-HTT ("fingerprints").

**Conclusions:** Such information can be essential for detecting potential local alterations in the ratio between different binding proteins on a network level in pathological conditions.

Moreover, these data might provide further insight in area-specific effects of frequently prescribed selective serotonin re-uptake inhibitors (SSRI):

- 1) due to the distinct local receptor and transporter availability;
- 2) SSRI application alters the postsynaptic receptor expression and thus;
- 3) leads to a modified interaction of inhibitory and excitatory receptors.