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THE MOLECULAR AND FUNCTIONAL NETWORK IN SSRI TREATMENT

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Selective serotonin reuptake inhibitors (SSRI) are blocking the serotonin transporter and decreasing the re-uptake of serotonin from extracellular space into the neuron. This mechanism increases time-dependently the serotonin level in the extracellular space, e.g. in the synaptic cleft. However, several adaptive processes including receptor subtypes and transporter down- and up-regulation, desensitization of autoreceptors in the raphe nuclei, increase of neurotrophic factors as the BDNF, etc. have been attributed to the therapeutic response. Increase of serotonin in the extracellular space is an insufficient explanation of treatment effects according to the latency in the therapeutic response and the in- and decrease in gene expression of several hundreds of genes during SSRI treatment. Network models with the involvement of several core players in this neuroplastic process are necessary. The main focus will be within the serotonergic system using promising neuroimaging methods as molecular neuroimaging with PET and functional magnetic resonance imaging.