Spatacsin: A new member of the synaptic family?

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Autosomal recessive hereditary spastic paraplegias (ARHSP) are a group of inherited neurodegenerative disorders characterized by progressive spasticity and weakness of the legs and in many cases the presence of other neurological signs. Mutations in SPG11 and SPG15, encoding Spatacsin and Spastizin respectively, are ARHSP with common motor and cognitive pathologies. Spatacsin and Spastizin showed partial co-localization and knock down of the zebrafish orthologues zspg11, alone or together with zspg15, revealed remarkable defects outgrowth of motor neuron axons.

Here, we reported for the first time the regulation of Spatacsin expression throughout brain development. Besides, we corroborated the localization of Spatacsin and its counterpart Spastizin in rodent and human neurons. Hence, assays carried out with mouse cortical neurons highlighted Spatacsin as a cytosolic protein well presented in post-mitotic neurons with a slight preference for projecting rather than interneuron. Spatacsin co-localized with presynaptic and postsynapric markers *in vitro* as well as in synaptosomes from adult animals. In this regard, spatacsin could be considered potentially as a new synaptic partner