Research shows power of FRET-based approach for distinguishing among distinct states of proteins

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In the December 2009 issue of the *Journal of General Physiology*, Moss et al. report a comprehensive investigation employing Förster resonance energy transfer (FRET) to study the {gamma}-amino acid (GABA) transporter GAT1, a member of the family that includes transporters for neurotransmitters dopamine (DAT), serotonin (SERT), norepinephrine (NET) and glycine (GlyT).

The investigators created a large panel of novel mouse GAT1 transporters tagged with cyan or yellow fluorescent proteins (CFP and YFP) and optimized their expression in neuroblastoma cells. They determined the trafficking, subcellular localization, and oligomerization state of mGAT1 and correlated these features with transporter function.

One finding is that individual components of the FRET amplitude distribution reveal GAT1 dimers, high-order oligomers (likely tetramers), and oligomers associated via PDZ-mediated interactions with the actin cytoskeleton. Secondly, these details of the FRET amplitude distribution correlate with transporter function. Finally, the mGAT1 C-terminus PDZ-interacting domain is necessary for anchoring functional transporters to the actin cytoskeleton at the cell periphery; the corresponding FRET signal appears only in mGAT1 constructs with wild-type function. More generally, the results show the power of the FRET-based approach for distinguishing among distinct states of proteins.

Medical Xpress

More information: Moss, F.J., et al. 2009. *J. Gen. Physiol.* doi:10.1085/jgp.200910314

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