Bridge-It® Tryptophan Fluorescence Assay

Applications in Neuroscience and Immunology

Today, we highlight neuroscience and immunology uses of our **Bridge-It® Tryptophan Fluorescence Assay. The Bridge-It® Tryptophan Fluorescence Assay assay is** capable of rapidly and sensitively quantifying L-tryptophan levels.

Tryptophan is an essential amino acid that can be converted into the brain neurotransmitter serotonin (5-HT) by one metabolic pathway, or it can be converted to L-kynurenine by another pathway, during immune system activation.

Serotonin is well-known in the neuroscience field for its role in maintaining balance of mood and well-being. Psychiatric disorders such as depression and autism result from imbalances between serotonin and other neurotransmitters. Serotonin is also active in natural brain development. Importantly, tryptophan is the only natural precursor of serotonin. Thus, monitoring tryptophan levels is relevant to serotonin, behavior, mood, and brain development research.

Through the other pathway, indoleamine 2,3-dioxygenase (IDO1) converts tryptophan to L-kynurenine. IDO1 is made in many tissues in response to immune activation and cancer. For example, indoleamine 2,3-dioxygenase levels correspond with the activity of dendritic cells, natural killer cells, and T lymphocytes.

The Bridge-It® tryptophan fluorescence assay is based on the activity of tryptophan repressor protein (TrpR), a bacterial DNA-binding protein. TrpR protein binds to its DNA-binding site in tryptophan-dependent fashion. In the presence of L-tryptophan, an increase in FRET fluorescence signal can be detected as a result of the tryptophan-dependent association of TrpR with its DNA-binding site. Tryptophan is readily detectable using the Bridge-It® tryptophan fluorescence assay in various types of test samples including bacterial growth medium, brain extract, yeast extract, as well as in human serum and urine.