Researchers at the University of South Florida have developed and characterized small molecule organic compounds that can modulate PTEN activity and serve as therapeutic agents for multiple cancers and various neurological disorders.

PTEN is a lipid- and protein-phosphatase which is a central molecule in many cellular processes and human diseases. Several neurological disorders, obesity, and even cancer have been associated with an alteration in PTEN activity and thus, have opened up new therapeutic avenues with PTEN as a major drug targeting focus. PTEN helps maintain cellular homeostasis and regulates the PI3K/AKT/mTOR pathway. Dysregulated PTEN activity has been observed in several neuropathologies, including autism spectrum disorders, macrocephaly, Alzheimer’s disease, and Traumatic Brain Injury (TBI). Thus, modulating PTEN function via small molecules is an ideal therapy rationale.

Scientists at the University of South Florida have created a novel class of peptidomimetic compounds that inhibit or activate tumor suppressor PTEN protein in human cells. As dysregulated PTEN function is found in several diseased states, modulation (activation/inhibition) of PTEN activity using small molecule chemical compounds has the potential to treat several diseases, including cancer. These small molecules have been shown to reduce proliferation, migration, and induce cell cycle arrest in lung cancer cells. These compounds signify an alternative therapy to current kinase inhibition modalities that have off-target effects.

ADVANTAGES:
- Can reduce proliferation and migration, and induce cell cycle arrest
- Decreased off-target effects
- Direct modulation of PTEN activity
- Applicable to a variety of cancers and neurological disorders

Modulation of PTEN Activity for the Treatment of Cancers and Neurological Diseases

Illustrates the Dose-Dependent Inhibition of Lung Adenocarcinoma Cell Proliferation and Cell Cycle Arrest Under Two Different Peptidomimetics Developed

Tech ID # 17A011