Researchers at the University of South Florida have developed a novel nanoparticle formulation of the drug afobazole. This invention can be used to improve the treatment of various diseases of the Central Nervous System (CNS).

Afobazole is currently used in once a day dosing for the treatment of anxiety in Europe and is being studied for the treatment of other diseases, including stroke and Alzheimer’s disease. Afobazole currently has a short half-life in vivo and has limited brain penetration. This shortcoming has led to an effort to improve drug pharmacokinetics and pharmacodynamics.

Our researchers have addressed this problem with a new formulation of the drug using nanoparticle technology. Specifically, this novel invention utilizes a nanoparticle carrier encapsulating afobazole to effectively improve blood brain barrier permeability. The improved pharmacokinetics may be used to treat various diseases of the CNS involving excessive neuronal activity and inflammation. In vitro release studies were carried out to investigate the rate of drug release by the nanoparticle formulations. An initial burst release of the drug was observed, followed by a sustained release of the drug from the nanoparticle’s polymer. In vitro experiments have also shown that the nanoparticle formation of the drug enhances the effectiveness of this drug for protecting neurons from ischemic injury.

This increased efficiency of the nanoparticle formulation is predicted to improve outcomes in multiple disease states in which afobazole is beneficial.

ADVANTAGES:
- Blood brain barrier permeability
- Enhanced effectiveness for protecting neurons from ischemic injury
- Potential to treat various diseases of the CNS involving excessive neuronal activity and inflammation

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