



A novel small molecule screening platform for tauopathies (2019-123)

FRET-based biosensors that identify early toxic states of tau for use in basic research and clinical development of therapeutics for tauopathies including Alzheimer's Disease.

IP Status: US Patent Pending; Application #: 16/790,486

Applications

- Drug screening for Alzheimer's disease and other tauopathies
- Basic research of tau protein and tauopathies (including Alzheimer's Disease)
- Biomarker development (delineation of toxic and non-toxic tau oligomer species)
- Assay and kit development

Key Benefits & Differentiators

- **Sensitive assay that's compatible with high throughput screening:** A fluorescent readout amenable to multiwell plate format and fluorescence lifetime detection (FLT) that increases sensitivity 30-fold.
- **Biologically relevant context:** Fluorescently labeled tau proteins function in cell culture, facilitating in-cell measurements and bypassing the need for time-consuming and costly purification steps.
- **Provides insights into mechanism:** Complementary dual-probes allow determination of effect on both tau oligomerization and the conformation of tau monomers.

Focusing on Tau in Tauopathies

Despite decades of research, there are currently no effective therapies for tauopathies, a class of neurodegenerative disorders that include Alzheimer's disease. While recent studies have indicated that tau oligomers are the primary toxic species in these diseases, very few clinical compounds that target tau itself are being pursued. To fill this gap, researchers at the University of Minnesota have developed biosensors that monitor tau oligomer and monomer conformations that can be used as a high-throughput screening (HTS) platform to identify novel compounds that modulate tau and attenuate associated toxicity. These compounds could be used in research to accelerate our understanding of tauopathies and how to treat them and/or could be developed as therapeutics.

Seeing the forest...and the trees

The technology works through two engineered distinct fluorescence resonance energy transfer (FRET) biosensors. The first of these biosensors measures intermolecular interactions between separate tau proteins, allowing a readout of oligomerization. The second biosensor uses single-molecule FRET (smFRET), to assess conformational changes within single tau proteins. Combined, the readout from these molecular probes will facilitate identification of compounds that inhibit tau oligomerization, and provide immediate insights into mechanism of action. Another major advantage of these biosensors is that they are functional in live cells, allowing

Technology ID

2019-123

Category

Life Sciences/Biomarkers
Life Sciences/Diagnostics & Imaging
Life Sciences/Human Health
Life Sciences/Neuroscience
Life Sciences/Pharmaceuticals
Life Sciences/Research Tools

Learn more



screening to be carried out in a biologically relevant context and without the need for costly and time consuming purification protocols.

Phase of Development

TRL: 2-3

Proof of concept. Biosensors have successfully been used to identify an inhibitor of tau oligomerization in cells and characterize the compound's effect on tau protein conformation.

Desired Partnerships

This technology is now available for:

- License
- Sponsored research
- Co-development

Please contact us to share your business' needs and learn more.

Publication

- **"Targeting the ensemble of heterogeneous tau oligomers in cells: A novel small screening platform for tauopathies."** Alzheimer's and Dementia, 2019

<https://doi.org/10.1016/j.jalz.2019.06.4954>

Researchers: Jonathan N. Sachs, PhD , Professor, Dept. of Biomedical Engineering