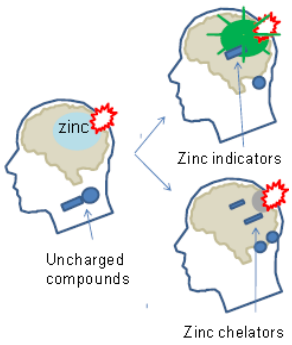
# BIOMARKER FOR THE DETECTION OF INJURY OR DEGENERATION IN THE BRAIN

## TECHNOLOGY OVERVIEW




The technology is a novel, non-invasive method to diagnose neurological and brain disorders. It provides a quantitative assay for traumatic brain injuries (TBI), brain tumors, strokes, epilepsy, and brain ischemia among other disorders. There is a large body of scientific publications linking elevated zinc concentrations in the brain with traumatic brain injury. Using a zinc specific assay to diagnose traumatic brain injury has been a challenge because currently available biomarkers are unsuccessful in traversing the blood-brain barrier (BBB). The invention overcomes this crucial limitation by using zinc sensitive indicators that have been conjugated with esters. Conjugated compounds can pass through the BBB and thus help evaluating the TBI affected area in the whole brain. Once they reach the extracellular space of the brain, the ester conjugations are removed by nonspecific esterases, resulting in the original fluorescence indicator that makes it easy to detect the damaged neurons at a cellular level. The biomarker helps produce a fluorescent effect in the diseased cells under pathology, and facilitates an accurate diagnosis and further treatment, and the evaluation of post-TBI recovery.

## POTENTIAL FIELDS OF USE

The technology can have a significant contribution in the areas of TBI diagnosis and recovery, where available drugs and procedures have had very limited success. About two percent (2%) of the U.S. population i.e. 5.3 million Americans are disabled due to TBI, with 1.5 million sustaining brain injuries every year. The drug/biomarkers may provide new hope to these patients who often suffer due to lack of effective diagnosis to determine their condition. The overall market of biomarkers is expected to grow to $12.8 billion by 2012, with neurological biomarkers having a significant share.

## BENEFIT ANALYSIS

The technology is a novel invention and overcomes the limitations faced by previous methods in diagnosing TBI:

- Highly sensitive and selective process makes it feasible to detect and monitor the injury at a cellular level.
- Facilitates a highly targeted treatment of the degenerating neurons.
- The zinc indicators are excluded from healthy membranes and minimize any possibility of inducing neurological toxicity during the diagnostic process unlike other procedures.
- Cost effective and safe diagnostic process.

## STAGE OF DEVELOPMENT

The drug is currently undergoing clinical studies. It was administered to rats that were suffering from varying conditions of TBI. The injured areas were distinct when their brains were evaluated using a fluorescent microscope. The technology requires further testing to verify its effectiveness in diagnosing humans.

## FUTURE DEVEOPMENT

Researchers will dedicate future efforts in verifying and increasing the effectiveness of the biomarker by evaluating the entire brain using In-vivo two-photon imaging or radio labeled PET imaging techniques. This will assist in providing a more accurate analysis of the injured areas and detecting the extent of the injury. They also plan to test more ester conjugated compounds to open the avenues for treating other neurological disorders.

## LICENSING OPPORTUNITIES

A patent for the technology is pending. Licensing opportunities are available.

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