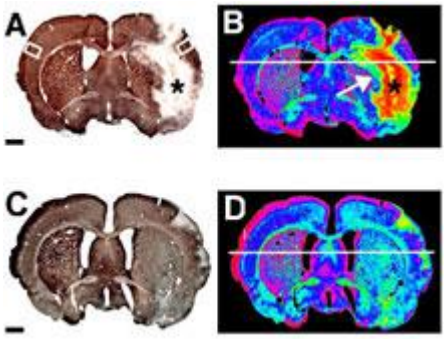
Technology Offer

# Innovative diagnostic agent for high resolution mapping of acute cerebral ischemia

Reference Number TO 21-00011

## Challenge

hanges in metabolism of neurons and glial cells are accompanied by alterations in uptake rates and the intra- and extracellular concentrations of cations, e.g. $Na^+$, $K^+$, $Ca^{2+}$, $Mg^{2+}$ and $Zn^{2+}$. In pathologies such as ischemia, tumors, infections or neurodegenerative diseases alterations of the cation equilibrium of the brain are an indicator of disease location and progression already at very early stages. Up to date the diagnostic potential of cation metabolism could not be fully exploited in routine diagnostics because of technical limitations: MRI spectrometry is inadequate for the tracking of most cation changes, and $^{18}$F-Deoxyglucose-PET can only be performed in bigger hospitals because of the high costs of the equipment and the short half-life of the isotope. In contrast, single photon emission computer tomography (SPECT) can measure gamma emission from isotopes with long half-lives and can easily be used in routine diagnostics outside of hospitals. However, up to date there is no comparable SPECT tracer for cation metabolism available that can cross the blood-brain barrier in a reasonable time frame.




*Distribution of Thallium after injection in rat brain at 15 min (A,B) and 7 days (C,D) after introduction of cerebral ischemia. The asterisk in B indicates the center of the ischemia.*

## Technology

The innovative technology comprises a lipophilic complex of $^{201}$Thallium ($^{201}$Thalium-Diethydithiocaramat, TIDDC) with an excellent property for measuring cation metabolism by means of SPECT. After passing the blood-brain barrier as a complex, the innovative diagnostic agent releases $Tl^+$ -ions within the brain. These ions are retained in the tissue and can be detected for a relatively long period of time due to their half-life of 73 hours. Therefore, the new tracer enables long-term measurement of cation metabolism and monitoring of stroke progression during the first hours of hospital admission which are crucial to fine-tune treatment decisions.

## Commercial Opportunity

In-licensing or collaboration for further development is possible.

## Developmental Status

Pre-clinical phase studies have been completed successfully and phase I studies are scheduled for the near future.

## Patent Situation

Patents have been granted in Europe, US and Korea with priority of 2005.

## Further Reading

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