Whole-brain analysis of dopaminergic cells

Assessment of changes dopaminergic neuronal architecture is imperative for assessment of potential neuroprotective treatment effects in preclinical models of dopaminergic diseases, including Parkinson's disease. Gubra offers light-sheet fluorescence microscopy-based 3D whole-brain visualization and quantitation of dopaminergic neurons using a standard catecholaminergic cell marker, tyrosine hydroxylase (TH).

Consider all TH-positive cells in the brain

3D imaging of the intact mouse brain

Light-sheet fluorescence microscopy allows for 3D imaging, mapping and quantification of TH-labelled neurons at single cell resolution throughout the entire, intact mouse brain.

Unbiased whole-brain quantitative histology

Deep learning computational analysis is applied for brain-wide quantitation of TH expression (fluorescence signal intensity) and automated, absolute quantitation of TH-positive neurons in key dopaminergic cell groups.

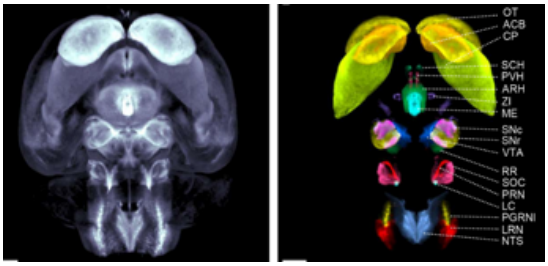
Whole-brain anatomical mapping

Automated detection and anatomical registration of TH-positive neurons is performed using a standard mouse brain atlas. TH fluorescence signals are evaluated in >250 individual brain regions, including dopaminergic areas.

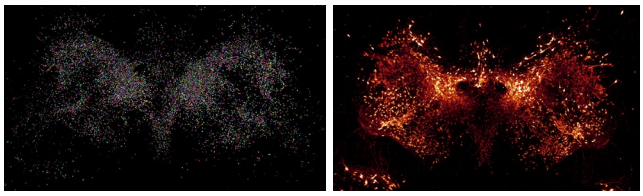
Preclinical models of CNS diseases

Quantitative whole-brain 3D mapping of TH-labelled neuron architecture is optimal for characterization of TH dynamics and drug treatment effects in mouse models of Parkinson's disease including the MPTP mouse.. Please read our paper to learn more.

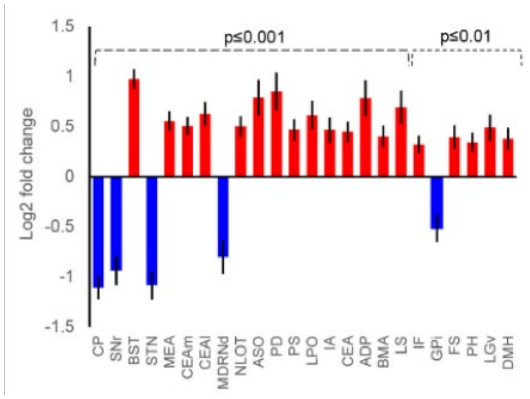
Send us the brains – our 3D TH imaging platform is applicable to any relevant in vivo CNS disease model in the mouse.



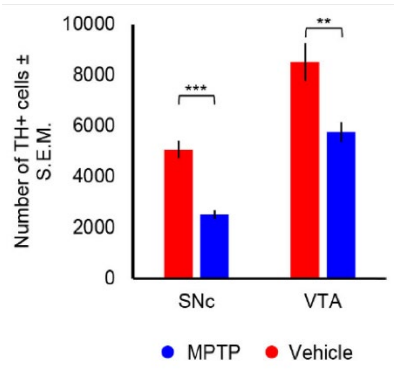
Left: Generation of brain-wide tyrosine hydroxylase (TH) expression map in the mouse (dorsal view). **Right:** Segmentation of TH-expression in major catecholaminergic cell groups.



Left: TH-positive neurons in the mouse midbrain (dorsal view). **Right:** Automated detection of TH-positive neurons in midbrain.



Automated whole-brain quantification of drug-induced changes in TH expression relative to vehicle control group.



Automated counting of the total number of TH-positive neurons in dopaminergic midbrain regions in MPTP mice compared to vehicle-dosed control mice.

gubra

info@gubra.dk | +45 3152 2650