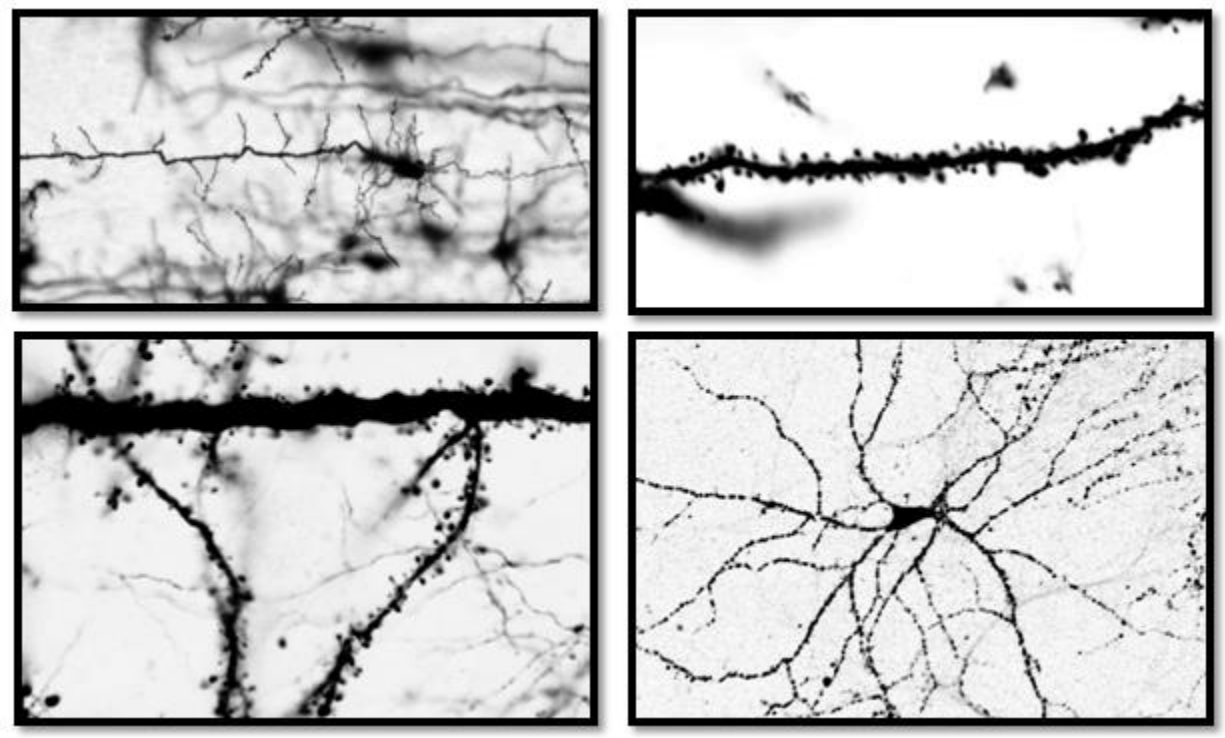
Neurohistology Research Services

Note: Please visit the Contact page and call us to get started. Our R&D team will discuss project requirements, types of specimens to be analyzed, how to fix your tissue for transport, and provide a quotation.

Bioenno provides comprehensive services to research scientists and physicians who are conducting neurohistology research. To begin, please visit the **Contact** page and call or email us to get started. The **Bioenno**team will discuss project requirements, types of specimens to be analyzed, how to fix your tissue for transport, and provide a quotation.

Golgi-Cox Impregnation and Staining Service



Bioenno provides Golgi-cox impregnation and staining of dendrites and dendritic spines of neurons found in various parts of the brain including the cortex, hippocampus, and cerebellum of rats, mice, cats, rabbits, and monkeys, as well as tissues obtained from post-mortem human brains. **Bioenno** will prepare slides and conduct multiple measurements to ensure statistically accurate results.

The measurements include:

- Sampling: Neurons will be chosen by using systematic unbiased sampling from interested brain areas.
- Sholl analysis of dendritic branching, including total dendritic length, number of intersections as well as branch points at concentric circles at increasing distance from the soma.

- Spine analysis, including the number and types of spines (mushroom-type, thin, stubby, and filopodia-like). Because the density/type of spines is variable from branch to branch, the analysis will be performed by comparing dendritic branches of the same order in all experimental groups.

- Analysis of soma: the largest area and size of impregnated neuron.

Final Report

Upon completion of the work, **Bioenno's** expert team will prepare a comprehensive final report with microscopic images, original measurements, data analysis including statistical analysis and graphis, discussion, per customer reporting requirements.

Importance of Golgi-Cox Impregnation and Staining

Golgi-Cox impregnation and staining allows scientists to clearly visualize the soma, dendrites, and dendritic spines of neurons from the brain tissues of various animals including rats, mice, cats, rabbits, and monkeys, as well as tissues obtained from post-mortem human brains. Understanding the morphology of these cellular structures is critical for research on the effects of various diseases on the brain including Alzheimer's, Parkinson's, depression, and stroke. In addition, understanding these structures allows scientists to better understand the effects of aging and the effects of man-made toxins and illicit drugs (*e.g.* methamphetamine) on the brain. Furthermore, Golgi-Cox impregnation and staining allows scientists to further understand neuroplasticity, neuroprotection, and ultimately how the brain can recover from neuron damage.

Importance of Dendrites of Neurons

Dendrites of neurons make up 95% of the total volume of the neuron. Synapses, which are structures that permit neurons to pass electrical and chemical signals to another cell, are found on dendritic spines. If there are any changes to the dendritic spines, this will cause neuron and potential brain damage. Scientists characterize these dendrites and dendritic spines in order to determine if there is any loss of structure that may lead to neuron and potential brain damage.

Immunocytochemistry (ICC) and In Situ Hybridization (ISH) Service

Bioenno is committed to providing high quality and reliable services of immunocytochemistry (ICC) and nonradioactive *in situ* hybridization (ISH) staining in various parts of the brain of rats, mice, cats, and rabbits. Combining our neuroanatomy expertise with advanced hybridization and immunolabeling techniques, Bioenno will perform single-, double-, or triple-labeling ICC/ISH. The report signals will be visualized by using either chromogenic substrates or fluorescent dyes. Upon completion of the work, **Bioenno** will prepare a comprehensive final report containing materials, methods, microscopic images, data analysis, and original slides, per customer reporting requirements.

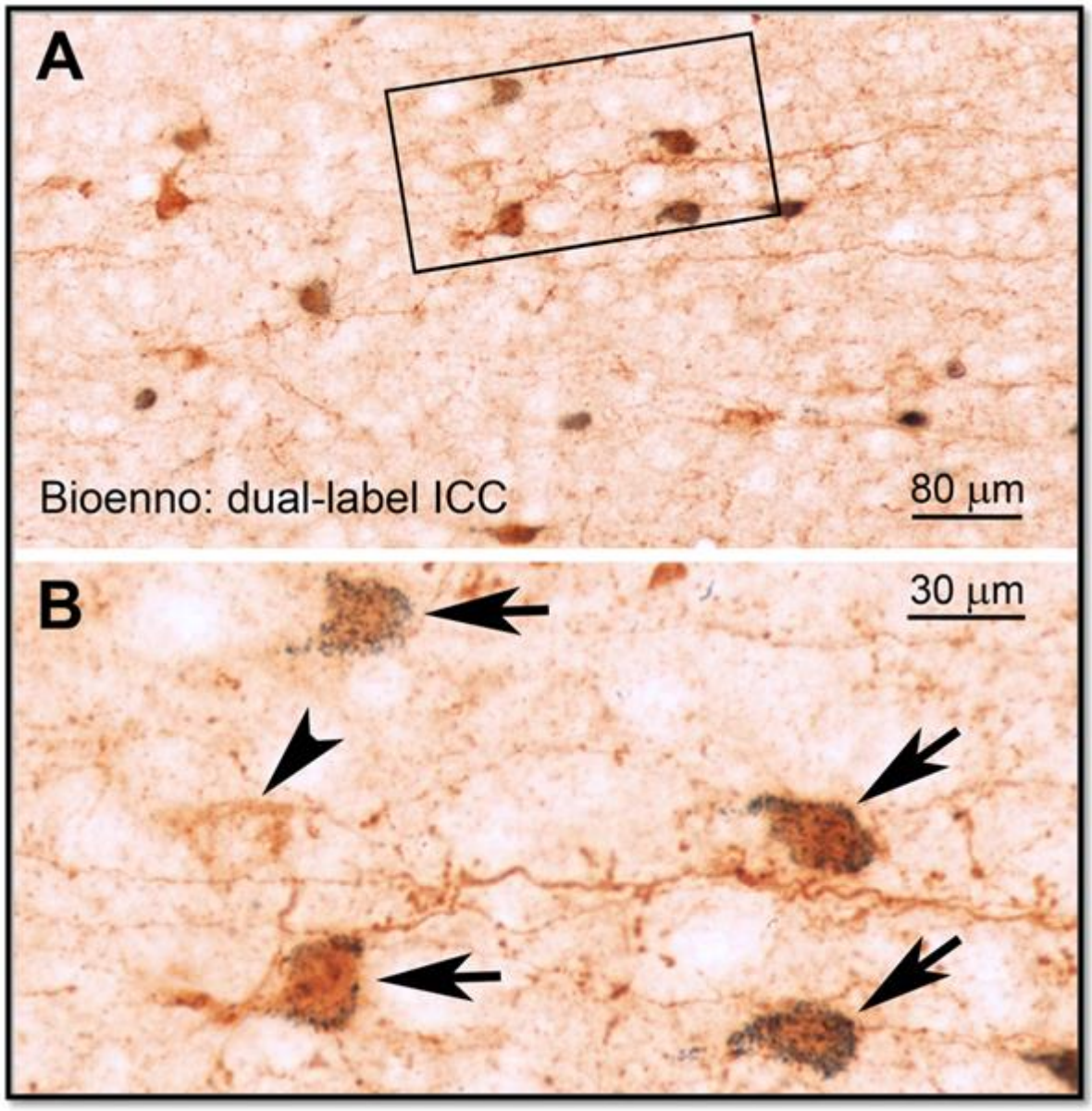


Fig. 1 Bioenno-performed double-labeling immunocytochemistry (ICC).

Chromogens consisted of 3,3'-diaminobenzidine (DAB) (brown) and benzidine dihydrochloride (dark blue). The images were taken from the somatosensory cortex of an adult rat. The boxed area in the top panel (A), shown at 20x objective, was magnified (B, 63x) to highlight the dual-labeled (arrows) and single-labeled (arrowhead) neurons.

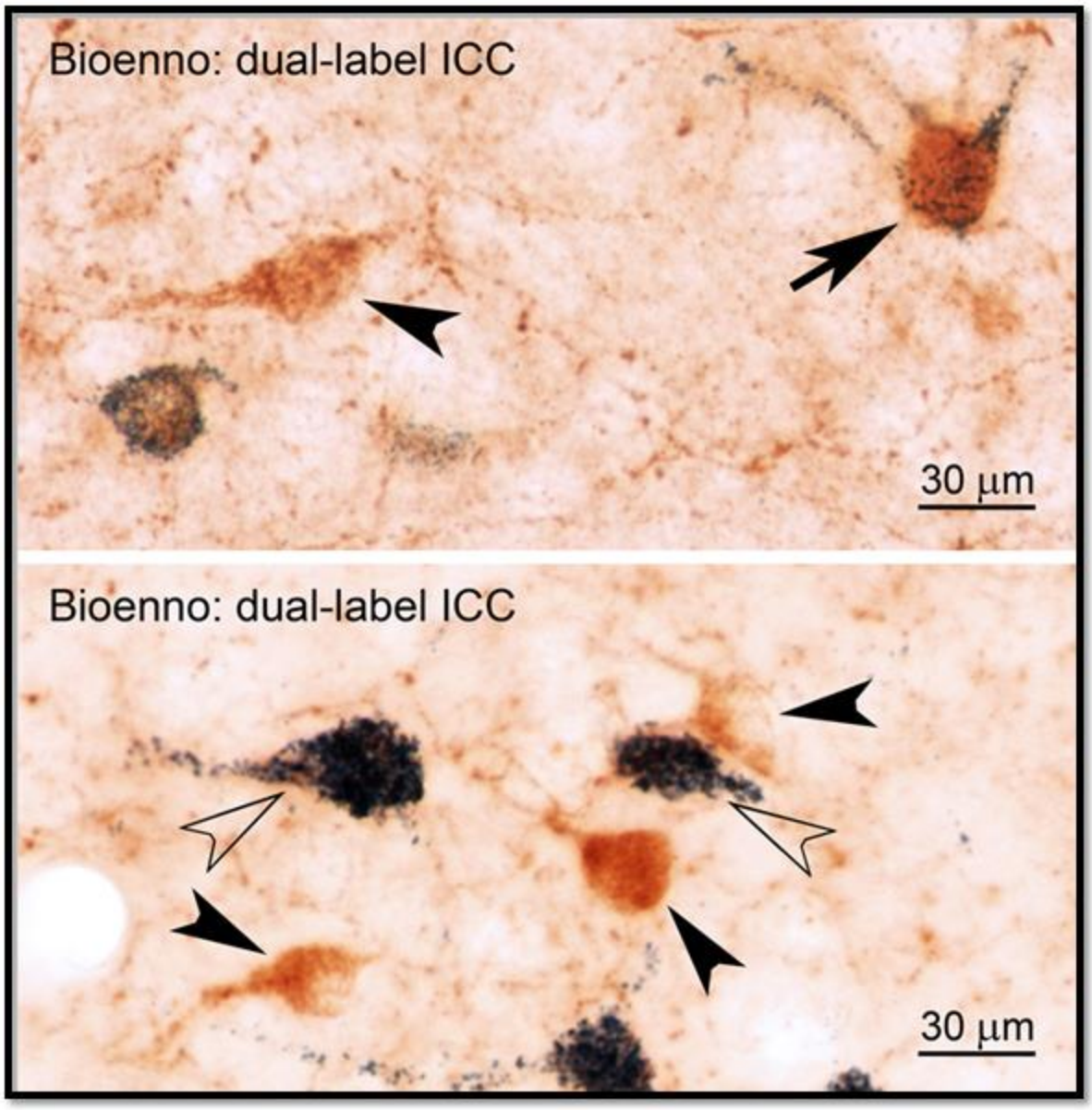


Fig. 2 Bioenno-performed double-labeling ICC to present single-labeled neurons (solid and empty arrowheads) and dual-labeled neurons (arrows) in different brain areas.

Chromogens are 3,3′-diaminobenzidine (brown) and benzidine dihydrochloride (dark blue). The images were taken at 63x objective.

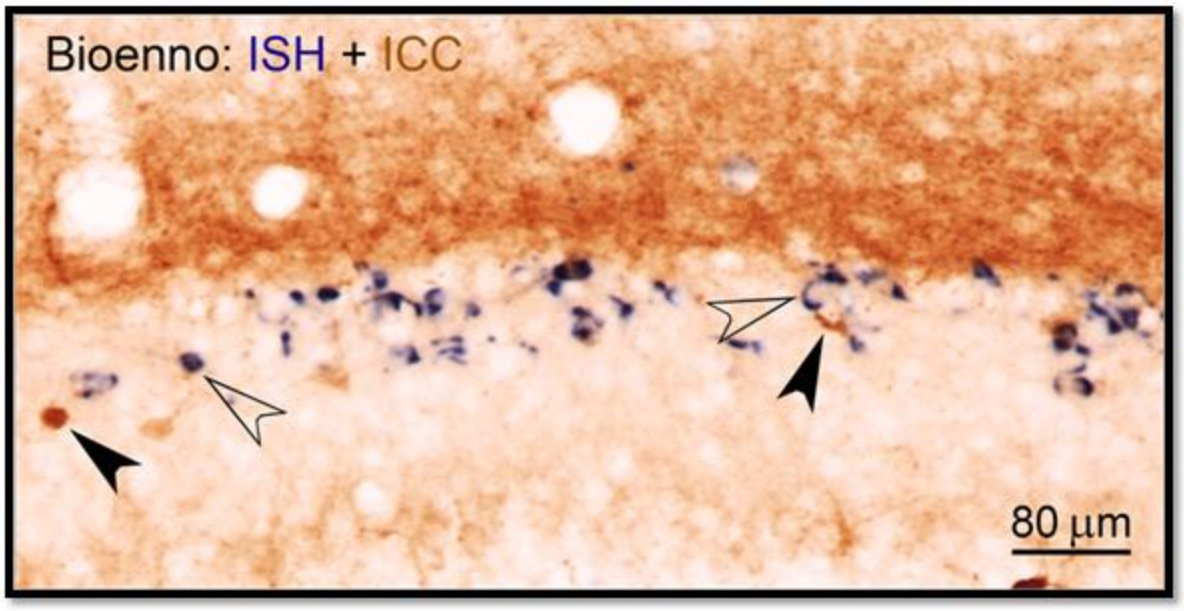


Fig. 3 Bioenno-performed nonradioactive *in situ* hybridization (ISH, blue) and immunocytochemistry (ICC, brown).

Digoxigenin-labeled probe was used and the mRNA hybridization signals were detected by chromogens 4-nitro blue tetrazolium chloride (NBT) and 5-bromo-4-chloro-3-indolyl phosphate (BCIP). The immunoreactive signals were visualized with 3,3'-diaminobenzidine (DAB). The empty arrowheads denote mRNA-expressing neurons, and solid arrowheads indicate protein-expressing neurons. The image was taken from the hippocampus of a young rat at 20x objective**.**

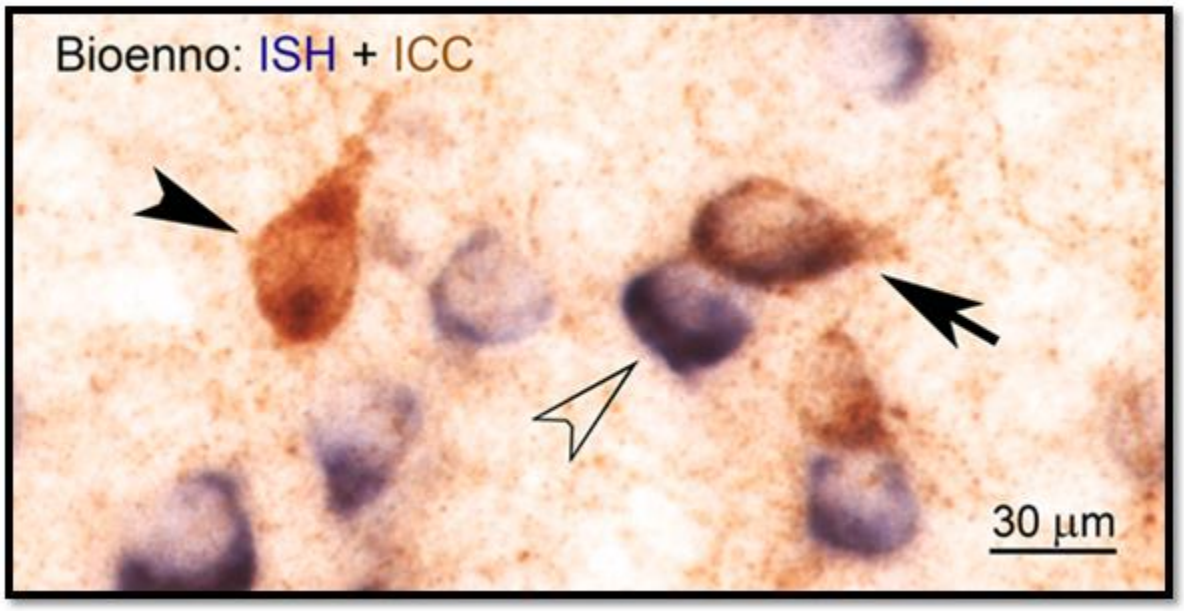


Fig. 4 Bioenno-performed combined ISH and ICC.

The nonradioactive hybridization signals (mRNA signals) were detected by NBT/BCIP (blue). The immunoreactive signals (protein signals) were visualized with DAB (brown). The image was taken from the accumbens nucleus of an adult rat at 63x objective.

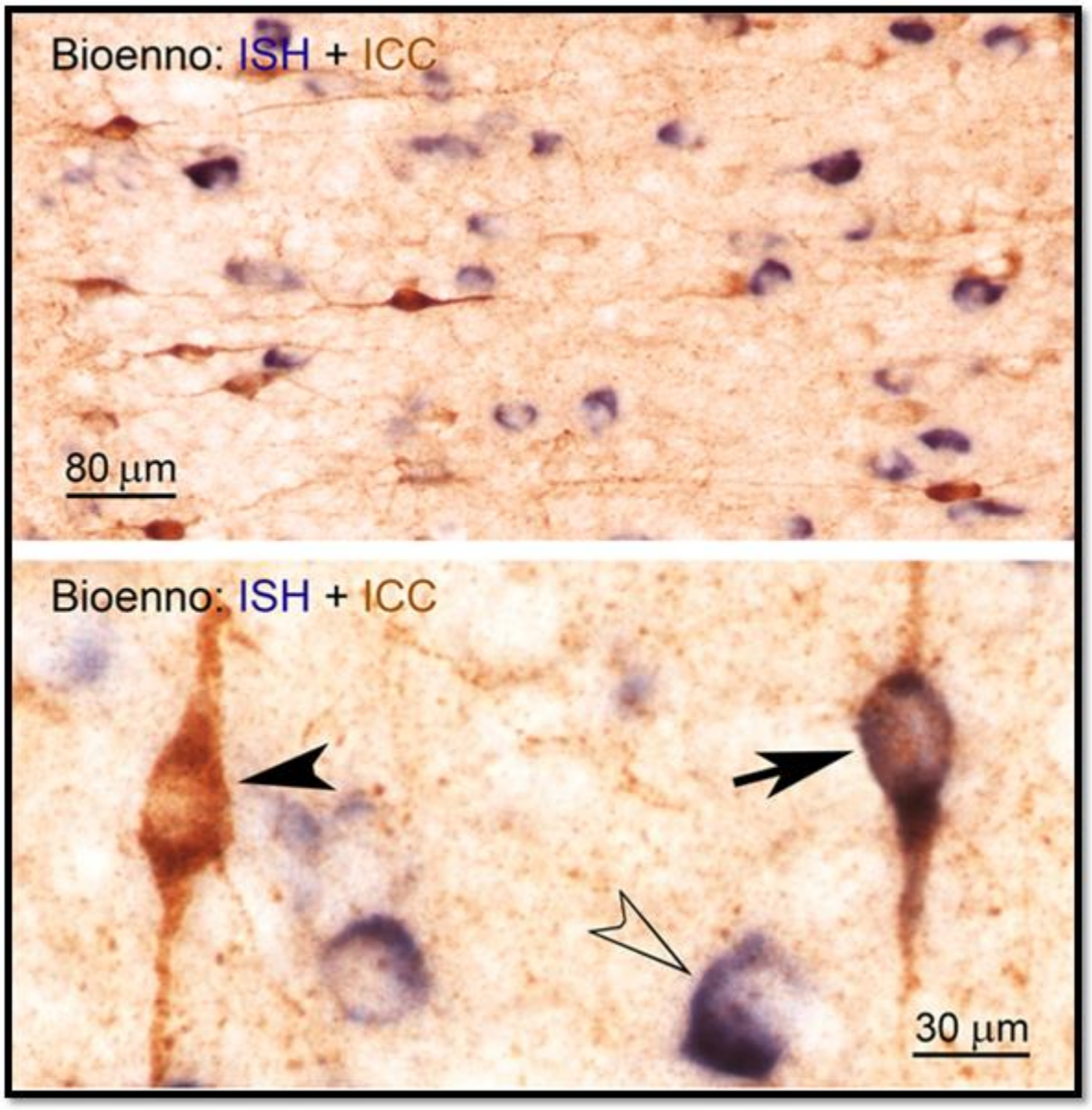


Fig. 5 Bioenno-performed ISH and ICC.

The mRNA hybridization signals were detected by NBT/BCIP (blue). The protein immunoreactive signals were visualized with DAB (brown). The images were taken from the cingulate cortex of an adult rat at 20x (top) and 63x (bottom) objectives.