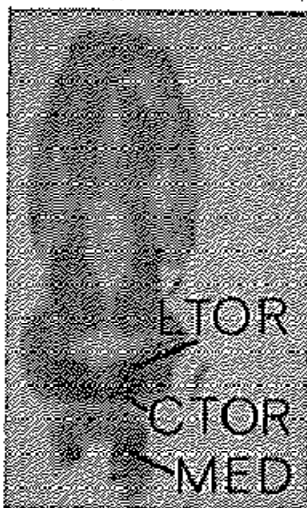


QUANTITATIVE [ $^3\text{H}$ ] AND [ $^{14}\text{C}$ ]-2-DEOXYGLUCOSE MAPPING OF THE AUDITORY CENTRAL NERVOUS SYSTEM IN XENOPUS LAEVIS. T. J. Sejnowski, D. B. Kelley, J. A. Paton and M. L. Yodlowski. Princeton University, Princeton, N. J., 08544 and The Rockefeller University, New York.

The 2-deoxyglucose (2DG) technique was used to study CNS activity of male South African clawed frogs during acoustic stimulation. Five  $\mu\text{Ci}$  [ $^{14}\text{C}$ ]-2DG or 50  $\mu\text{Ci}$  [ $^3\text{H}$ ]-2DG was injected into the dorsal lymph sacs of 20 males; frogs were then presented with 2 hours of taped conspecific vocalizations. Half of the frogs were transcardially perfused with saline followed by 10% formalin. The [ $^{14}\text{C}$ ]-2DG brains were processed as described in Sokoloff *et al.*, J. Neurochem. 28: 897, 1977. The [ $^3\text{H}$ ]-2DG brains were sectioned at  $-22^\circ\text{C}$  on a cryostat in a darkroom. Sections were picked up on slides precoated with NTB-3 emulsion and dried at room temperature. Slides were developed after 4 weeks and some were counterstained with cresyl violet to identify the labelled areas. Optical densities of 125 $\mu$  spots were measured with a photodensitometer. The measurements were normalized against a standard region of the dorsal optic tectum in each animal.

The following regions were consistently labelled: dorsal auditory medulla (MED), superior olive, anterior and posterior thalamus, caudal torus semicircularis (CTOR) and laminar nucleus of the torus (LTOR). A  $^{14}\text{C}$  autoradiogram of a section through the torus and dorsal medulla is shown below. Unilateral removal of the middle ear bones decreased uptake in contralateral LTOR but not in CTOR. The 2DG labelling in the torus was used to quantitatively compare perfused with nonperfused tissue and [ $^{14}\text{C}$ ]- with [ $^3\text{H}$ ]-2DG autoradiograms. The table below gives the mean and standard deviation of the maximum optical density for [ $^{14}\text{C}$ ] perfused and nonperfused autoradiograms. Perfusion did not reduce the label densities in LTOR or CTOR. The pattern of labelling using [ $^3\text{H}$ ]-2DG was the same as that seen with [ $^{14}\text{C}$ ]-2DG; optical densities were, however, more variable.



These results indicate that the 2DG method can be used to functionally map the auditory system in an anuran amphibian, that autoradiograms can be successfully prepared using perfused tissue and that [ $^3\text{H}$ ]-2DG is an alternative but less reliable method for obtaining 2DG autoradiograms.

	LTOR	CTOR
Perfused	2.9 $\pm$ .2	1.9 $\pm$ .3
Unperfused	2.6 $\pm$ .5	2.2 $\pm$ .5

N=4 in each group