

**A stereotaxic method of anatomical localization by means of H₂¹⁵O positron emission tomography applicable to the brain activation study in cats:
Registration of images of cerebral blood flow to brain atlas**

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In the neuronal activation study of normal animals, precise anatomical correlation, preferentially to a detailed brain atlas, is required for the activation foci co-registration. To obtain precise regional correlation between H₂¹⁵O-PET images and the brain atlas, a method of stereotaxic image reorientation was applied to an activation study with vibrotactile stimulation. Cats anesthetized with halothane underwent repeated measurements of regional cerebral blood flow (rCBF) in the resting condition and during vibration of the right forepaw. The image set was adjusted three-dimensionally to the atlas. The postmortem brain was sectioned according to the atlas planes. The activated areas were determined by the stimulus-minus-resting subtraction images, and the areas were projected to the atlas. The PET images of the cat brain were compatible both to the postmortem brain slices and to the brain atlas. The activation foci obtained from the subtraction images corresponded to the area around the coronal sulcus, which is electrophysiologically known as the primary sensory area as described in the atlas. There were precise regional correlations between the PET image and anatomy in a PET activation study of the cat by means of stereotaxic image reorientation.

Key words: PET; H₂¹⁵O; cerebral blood flow; atlas, cats; vibrotactile activation