

## Protein kinase C in the barrel cortex

Dorota Nowicka

Department of Neurophysiology, Nencki Institute of Experimental Biology, 3 Pasteur St., 02-093 Warsaw, Poland

**INTRODUCTION AND METHODS.** PKC family of enzymes typically activated by phospholipid hydrolysis and calcium consists of 12 isozymes that can be further categorized into conventional, novel and atypical PKCs. It has been widely accepted that  $\text{Ca}^{2+}$ -dependent (conventional) PKCs play a major role in synaptic plasticity. Changes in PKC distribution may play an important role in associative memory storage within the hippocampus (3). However, changes in PKC have also been observed in neocortex, suggesting more general role of PKC in neural plasticity (2). The barrel cortex is a region of the cortex receiving input from mystacial vibrissae. Manipulating of the sensory input results in modifications of the barrels. The processes underlying these changes remain unknown. In our preliminary studies we investigated distribution of PKC in the mouse barrel cortex using  $^3\text{H}$ -phorbol ester-12,13-dibutyrate ( $^3\text{HPDBu}$ ) autoradiography. The binding was performed as described (4). Nonspecific binding was assessed in the presence of  $1\mu\text{M}$  PDBu.

**RESULTS AND DISCUSSION.** We observed that  $^3\text{HPDBu}$  binding differs across cortical layers (Fig. 1C). The highest level of the binding was observed in layers II/III (Fig. 1C, D). Layer IV showed relatively low level of binding density (Fig. 1D). Layers V/VI exhibited additional sublamination (Fig. 1D). We also observed that the level of  $^3\text{HPDBu}$  binding in the barrel field is slightly lower than in surrounding areas of the cortex. The pattern of barrels could not be discerned after  $^3\text{HPDBu}$  binding (Fig. 1B) in contrast to the picture obtained by the Nissl method (Fig. 1A). A relatively low level of  $^3\text{HPDBu}$  binding to the barrel field questions a direct involvement of the  $^3\text{HPDBu}$ -binding classical and novel isoforms of PKC in physiological functions of this brain region.

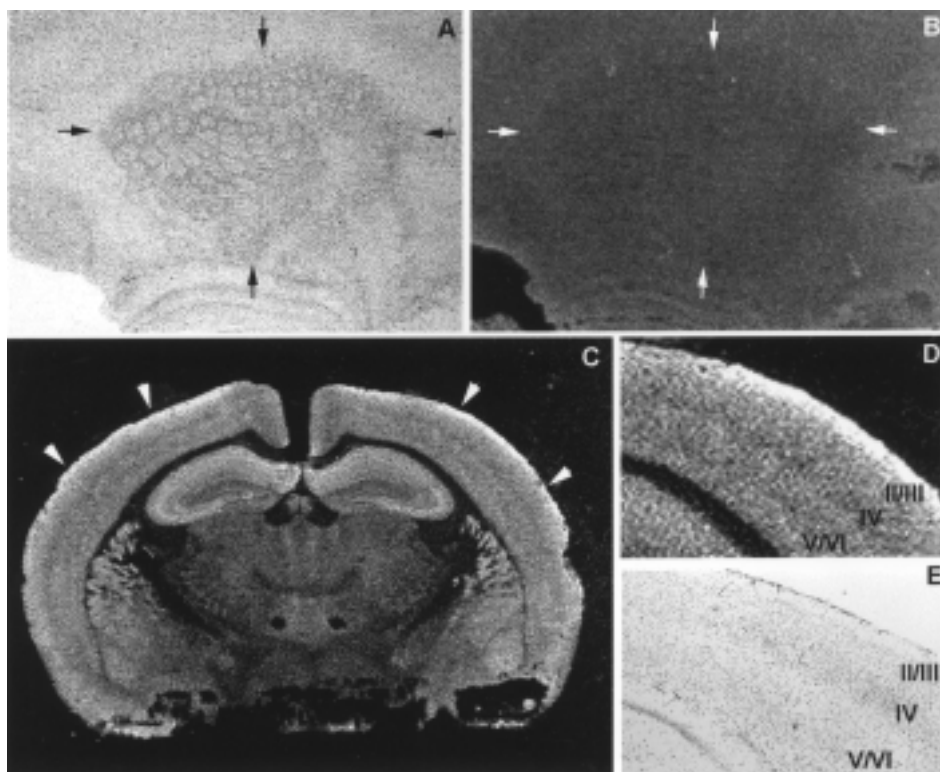


Fig. 1. A, Nissl staining of the barrel field. B,  $^3\text{HPDBu}$  binding to the section previously showed on A. C, distribution of  $^3\text{HPDBu}$  binding in brain. D, lamination of  $^3\text{HPDBu}$  binding in the somatosensory cortex. E, Nissl staining of the corresponding area of the cortex. II/III, V/VI – cortical layers, arrows on A and B delineate the barrel field, arrowheads on C point to the barrel cortex.

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