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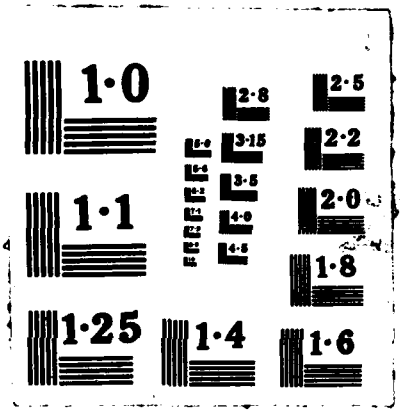
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FIELD	GROUP	SUB-GROUP	mossy fiber synaptic terminals, hippocampus, LTP, subcellular fractionation and patch clamping facility

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

This grant was made under the DoD University Research Instrumentation Program. Our request was for equipment to implement a subcellular fractionation and patch clamping facility. The equipment requested was for a Beckman L7-55 ultracentrifuge with a SW-41 rotor kit, a Beckman J2-21 centrifuge with JS-13.1 and JA-20 rotors, a Masscomp 5400 computer, a Zeiss IM microscope, and a Newport vibration isolation table. All items of equipment have been ordered, received, and have been in use for several months. The research for which this equipment is being used is that associated with AFOSR-85-0178. We have been isolating an enriched fraction of mossy fiber synaptic terminals from hippocampus of rat and investigating mechanisms for release of glutamate.

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Mechanisms of Transmitter Release in Hippocampus
University Research Instrumentation Program
AFOSR-86-0124
Final Report

This grant was for the purchase of equipment to establish a subcellular fractionation and patch clamping facility at Baylor College of Medicine. This equipment will be utilized for research projects associated with AFOSR Grant 85-0178, "Amine Neurotransmitter Regulation of Long-Term Synaptic Plasticity in Hippocampus." The equipment requested was: Beckman L7-55 ultracentrifuge with SW-41 rotor kit, Beckman J2-21 centrifuge with JS-13.1 and JA-20 rotors, Masscomp 5400 computer, Zeiss IM microscope, and a Newport vibration isolation table. All of the above items of equipment have been purchased, received, and have been in use for the last six months.

The experiments involve the isolation of an enriched fraction of mossy fiber synaptic terminals from adult rats. We have been investigating mechanisms of transmitter release, using biochemical and electrophysiological techniques. We have used the centrifuges successfully to develop this preparation of enriched mossy fiber synaptosomes. The computer, microscope, and isolation table are in use as a patch clamping facility to study the electrophysiological properties of these terminals.

We have successfully measured the potassium stimulated and calcium dependent release of endogenous glutamate from these terminals. We have found that several phorbol esters are able to potentiate this release of glutamate, and we are in the process of investigating the mechanisms underlying this enhanced release.

Our patch clamping has met with only limited success thus far. Although we have shown that the technique can be successfully applied to these small terminals, we have yet to make recordings of single calcium channels. The channels recorded thus far appear to be nonselective cation channels. We are currently in the process of altering our procedures and are hopeful that this aspect of the project will meet with more success in the very near future.

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