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Device for improving single-unit neural recording techniques in animal subjects.

Present single-unit neural recording techniques are either slow or potentially dangerous to the subject. There exist two groups of single cell neural recording devices: single electrode and multiple electrode micromanipulators. The single electrode configuration allows for the depth of the electrode and its protective guide tube to be controlled accurately and independently. Multiple electrode manipulation systems have many electrodes placed in close proximity in a cluster of guide tubes that cannot be controlled independently. In order for this device to penetrate the dura, it must create a much larger hole, and the resulting pressure required to piece through the dura also increases. This amplifies the potential for infection and injury. The advantages of a multiple electrode system, however, is that it both cuts down dramatically on the data collection time and can provide insight as to how neurons communicate amongst each other in order to complete a task. The device developed combines the safety of single electrode devices with the efficiency and enhanced data quality that comes with multiple electrode systems. This is achieved by spacing out the electrodes and allowing each individual electrode and guide tube to be controlled independently. In addition, this device employs a supplementary bridge that increases the stability of the guide tubes and in turn, the electrodes themselves. The bridge is also capable of locking the guide tubes in place, which minimizes the potential for unwanted movement that may prove harmful to the subject and the data.

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