Microdialysis

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OVERVIEW

With over 14,000 papers currently in the literature, and more appearing daily, microdialysis is one of the most popular techniques for sampling biological molecules from living tissue. Dialysis, the process of sampling fluid in the *in vivo* environment, utilizes a semi-permeable membrane, allowing endogenous biological molecules to diffuse into a sample via a concentration gradient. The main focus of this chapter will be microdialysis in brain. *In vivo* brain microdialysis sampling has been critical in enhancing our understanding of the native biochemistry of important central nervous system (CNS) proteins. Additionally, brain microdialysis has been essential in revealing many physiological and molecular aspects of human brain disease. There are a multitude of other techniques available for the studying brain neurochemistry, such as positron and single photon emission tomography, biosensors (including carbon fiber microelectrodes), push–pull perfusion, and ultrafiltration. The advantages of microdialysis lie in its ability to simultaneously sample a variety of biologically relevant signaling molecules, measure basal or stimulated levels of endogenous neurotransmitters, and monitor the pharmacokinetics of exogenously administered compounds. *In vivo* microdialysis has historically been performed in rats, but with the advent of genetically altered mice in the mid-1990s, manufacturers have miniaturized microdialysis probes to take advantage of these important models,

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