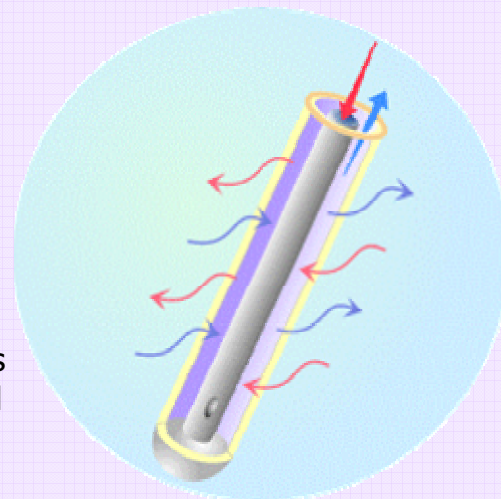
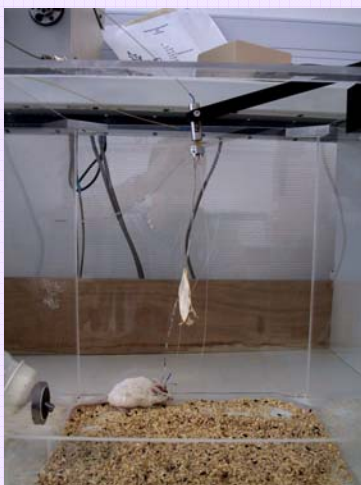


## What is In Vivo Microdialysis?

In vivo microdialysis is a technique used to monitor the chemistry of extracellular space in living tissue. This chemical biosensor provides a preview of chemical changes in intact tissue - before those events are reflected as chemical changes in the blood. A microdialysis probe is designed to mimic a blood capillary. When a physiological salt solution - the perfusion medium - (e.g., Ringer) is slowly perfused through the microdialysis probe, it draws chemical substances from the extracellular space into the probe as it equilibrates with the extracellular fluid. Eventually the tube contains a representative proportion of molecules found in the extracellular space (see schematic at right).



The probe is based on a concentric tube whereby the perfusion medium enters through a fine steel inner cannula (hollow tube) and is pumped slowly to the distal end where it flows into the tip of the probe that is surrounded by the dialysis membrane. This is the site of dialysis i.e., diffusion of substances across and back from the extracellular fluid. The perfusion medium exits the probe by flowing through a larger outer steel cannula and the resulting dialysate is collected at the proximal end.



It is important to realize that dialysis is bi-directional i.e., there is exchange of molecules in both directions across the membrane and that the difference in the concentration of a specific molecule across the dialysis membrane will govern the direction of the diffusion

gradient. Thus, one can collect an endogenous compound (e.g., a neurotransmitter) and at the same time introduce an exogenous compound (e.g., receptor agonist or antagonist) into the extracellular space. By using microdialysis, for example, it is possible to monitor the release of neurotransmitters from nerve cells in two nerve circuits mediating movement and emotion.

The goal of in vivo microdialysis is to evaluate a compound's ability to regulate neurotransmitter level within a discrete brain structure.