

## Detecting Catecholamines--A Journey from Beaker to the Behaving Brain

R. Mark Wightman  
Emeritus Professor

Department of Chemistry and Neuroscience Center, University of North Carolina at Chapel Hill,  
Chapel Hill, NC 27516

I began my foray into catecholamines in my postdoctoral research with Ralph Adams at the University of Kansas. Ralph had the revolutionary idea that electroanalytical chemistry could be useful for the detection of catecholamines. From this fundamental concept evolved the use of electrochemical detectors with liquid chromatography as well as the use of microelectrodes for *in situ* sensing of catecholamines. The early research with *in vivo* electrochemistry was complicated by interference from a variety of substances including catecholamine metabolites and ascorbate. However, a variety of approaches were taken to improve the specificity of the measurements and to adapt them for measurements on a subsecond time scale. Today these approaches are extremely useful to understand the dynamics of catecholamines during release, uptake and signaling. They can be used to probe single exocytotic events from single cells in culture. They also can be used in the brain of awake animals to watch catecholamine signaling during behavior. This approach has been used to confirm dopamine release in response to cues that predict reward as well as to examine norepinephrine signaling in aversive situations.