# Simulation of Catecholamine Release through Patch Clamp Amperometry using MCell and DReAMM

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A popular method of voltage detection across a cell membrane involves patch clamp amperometry. With the assistance of Blender, a 3D visualization may be constructed to model the patch clamp, with the carbon fibre electrode (CFE), connecting to the cell membrane, with corresponding cations. MCell, reads MDL (Model Description Language) files to interpret and create the simulation of objects. The DreaMM program displays a 3D visualization of how ions are detected on the CFE and how different variables may affect the release rate of ions through the channel. Neurotransmitters such as catecholamines are released through the fusion pore by a process of exocytosis. Efflux of catecholamines hitting the carbon fibre electrode after they have been released from the vesicle produce an amperometric current. The position of the CFE within the patch clamp, as well as vesicle and pore size is varied to determine the rate of efflux across the pore.