



COLLEGE OF WILLIAM AND MARY TECHNOLOGY TRANSFER OFFICE

TITLE (AND CASE NUMBER) OF INVENTION NEURAL NANOPROBES (1010)

INVENTORS

Karl Mendoza, John D. Griffin

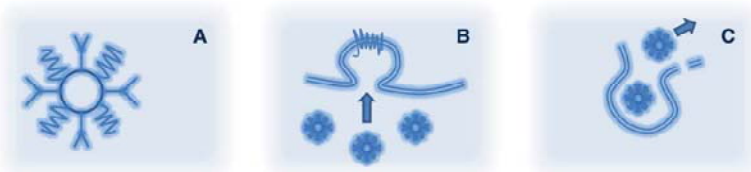
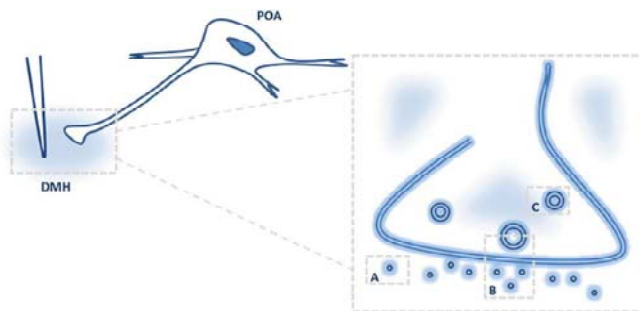
APPLICATIONS

Nanoprobes, methodology for retrograde labeling of neurons

SUMMARY

We have developed neural nanoprobes useful as a tagging system for neuronal pathway identification. The neural nanoprobes comprise metallic nanoparticles that are conjugated to both (i) a cationic polymer and (ii) an antibody to a vesicular transporter protein. These methods allow retrograde characterization of glutamatergic neurons in a tissue slice preparation. Since the nanoparticles used are non-lipid-soluble and are specifically conjugated to enter and escape the synaptic vesicular machinery, these nanoparticles allow probing of a neuron's somatic origin, via the synapse, by diffusional means.

In particular, these probes are advantageous over the prior art by providing enhanced specificity and low biotoxicity, leaving neurons of interest suitably intact for live-cell recording.



Schematic Diagram of Nanoprobe Mechanism. Probe injection in the DMH allows vesicular uptake at the axon terminal. (A) Probe conjugates, such as VGLUT-2 antibodies (curvy line) and PEI molecules (Y-shape), are surface-conjugated on metallic nanoparticles (circle). (B) These conjugates facilitate membrane protein attachment during vesicular formation. (C) This is followed by endosomal escape from the vesicular lumen into the cytosol.

PATENT STATUS

Patent pending.

CONTACT INFORMATION

Jason McDevitt (757-221-1751); jason.mcdevitt@wm.edu