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## Functions of neurofilaments in synapses

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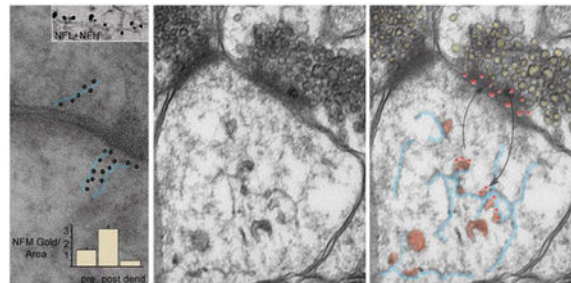
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Functional neurofilament (NF) subunit assemblies in synapses. Left panel: immunogold-labeled antibodies against the NFM subunit decorating synaptic structures in a linear pattern (immunogold particles outlined in blue) suggesting the presence of short NFs and protofilament/protofibril or unit length filament assemblies. In the upper inset, a filament within a postsynaptic bouton is decorated by immunogold antibodies to both NFL (large gold dots) and NFH (small gold dots). Morphometric analysis indicates a higher density of immunogold labeling in postsynaptic boutons than in preterminal dendrites or presynaptic terminals (graph inset). Middle panel: ultrastructural image of a human synapse depicts membranous vesicles, many of which appear to be associated with a loose network of short 10-nm filaments in the postsynaptic region. Right panel: evidence supports a biological mechanism whereby D1 dopamine receptors internalized on endosomes from the postsynaptic surface (red asterisks) dock on synaptic NF subunit assemblies (outlined in blue) where they are readily available to recycle on endosomes to the surface in response to ligand stimulation. The cartoon overlay of the EM image is the hypothetical depiction of this

process. For more information on this topic, please refer to the article by Yuan *et al.* on pages 986-994.

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