**Supplemental Figure 1**

Series of backscattered electron images (reversed contrast) from the block face of resin-embedded cerebellar tissue from an adult mouse milled at 15 nm depths between images. Images show a single asymmetric synapse on a dendritic spine (sp) and vesicles contained within a bouton (bt). Yellow arrowheads (filled) indicate a single vesicle that can be seen in consecutive images as a structure with clear centre, and also detected in the preceding image (open arrowhead), but without a clear centre.

**Supplemental Movie 1**

Series of 120 block face scanning images showing the region that is outlined with a dotted line in Figure 4 a. Each image is in a compressed format (jpeg) though enough detail remains in the series to enable the viewer to follow each neurite (dendrite, spine and axon) throughout the volume, making it possible for detailed morphometric measurements of each structure and their interconnectivity. The horizontal field width is 9 micrometers.