

Supplementary Information

Gold-conjugating nanoprobe for targeted molecular imaging using high-resolution secondary ion mass spectrometry

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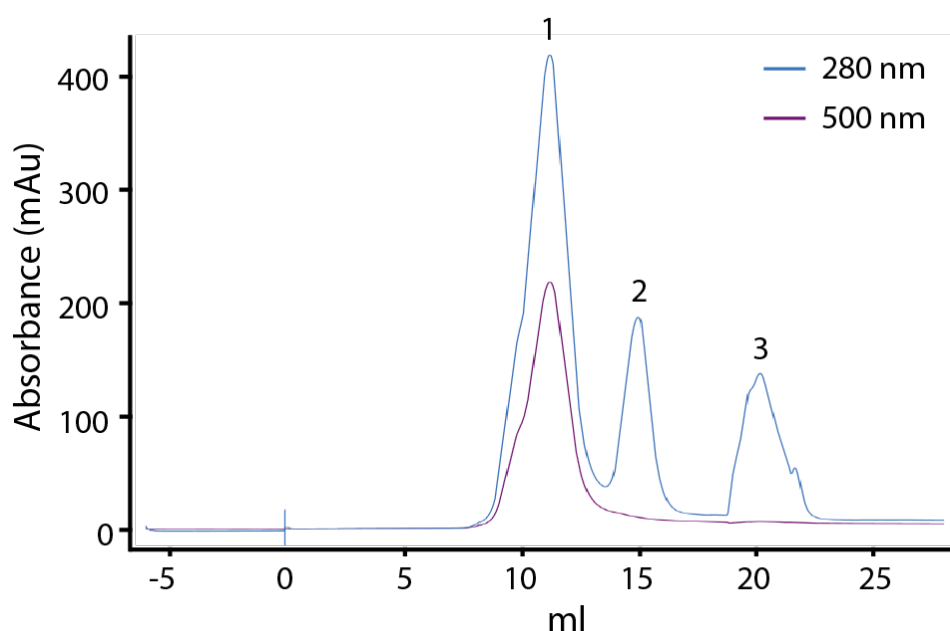


Figure S1. Size-Exclusion Chromatography (SEC) of the nanobody-gold conjugation. Superdex-75 increase column was used to separate 3 nm gold NPs conjugated to anti-mouse nanobody. Peak 1 is the conjugated nanobody and gold NPs, which show their absorbances at the wavelengths of 280 nm and 500 nm, respectively. Peak 2 corresponds to the unconjugated nanobody absorbing at 280 nm. And peak 3 corresponds to a small protein fraction after cleaving the His-Tag from the nanobody.

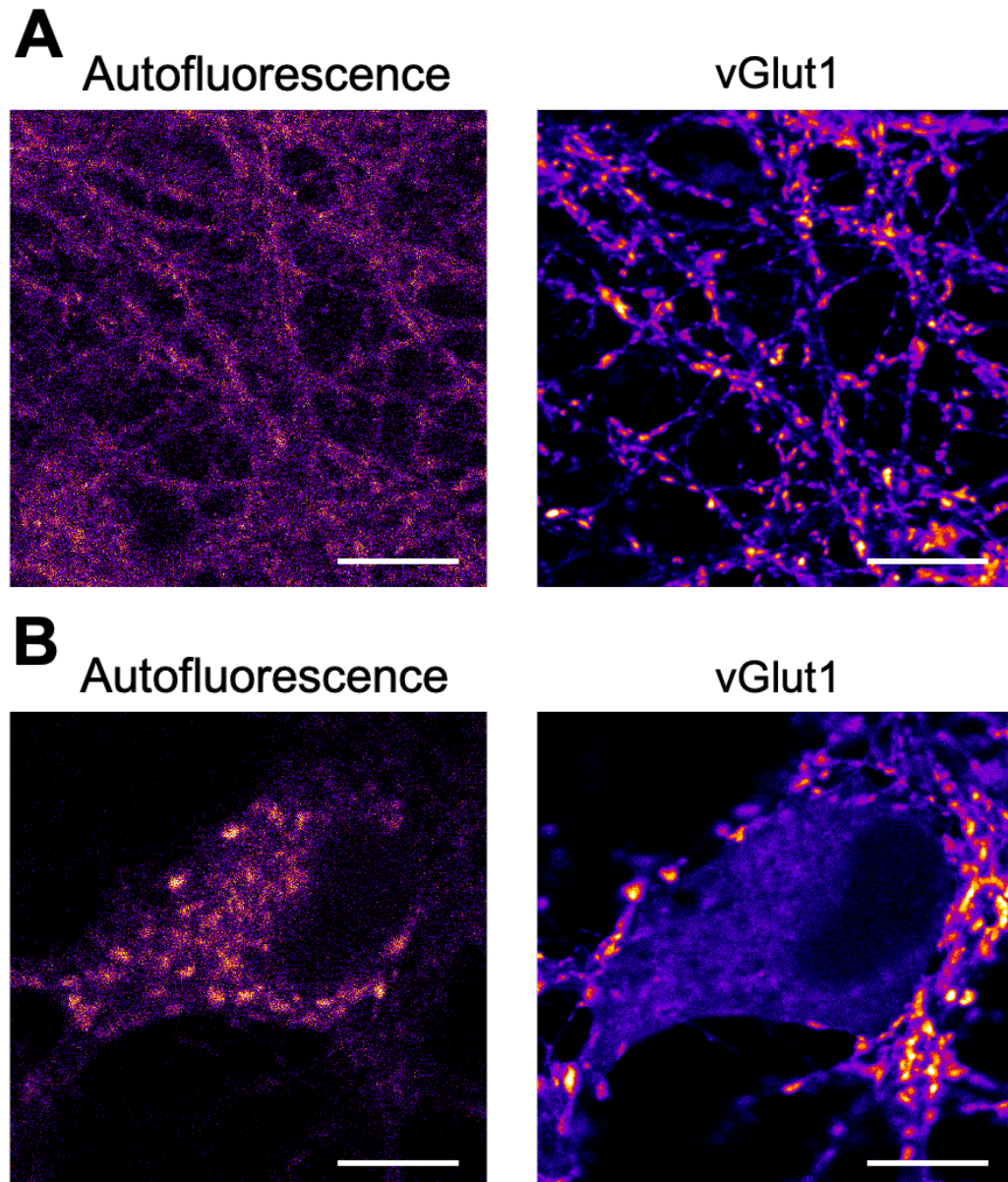


Figure S2. Confocal fluorescence images of vesicular glutamate transporter (vGlut1) primary mouse antibody in hippocampal neurons, which is then revealed by Abberior STAR 580-anti-mouse secondary antibody. **A.** vGlut localizes as “hot spots” along the neurites. **B.** vGlut localizes dominantly in the neurites compared to the cell body. Scale bars are 10 μm .

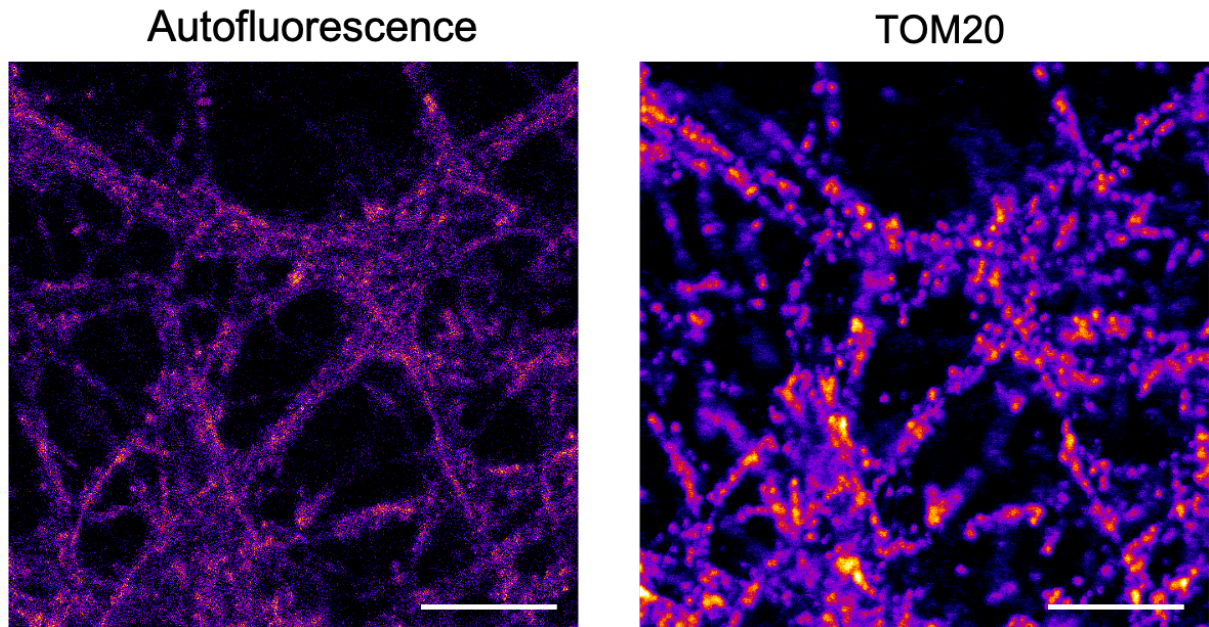
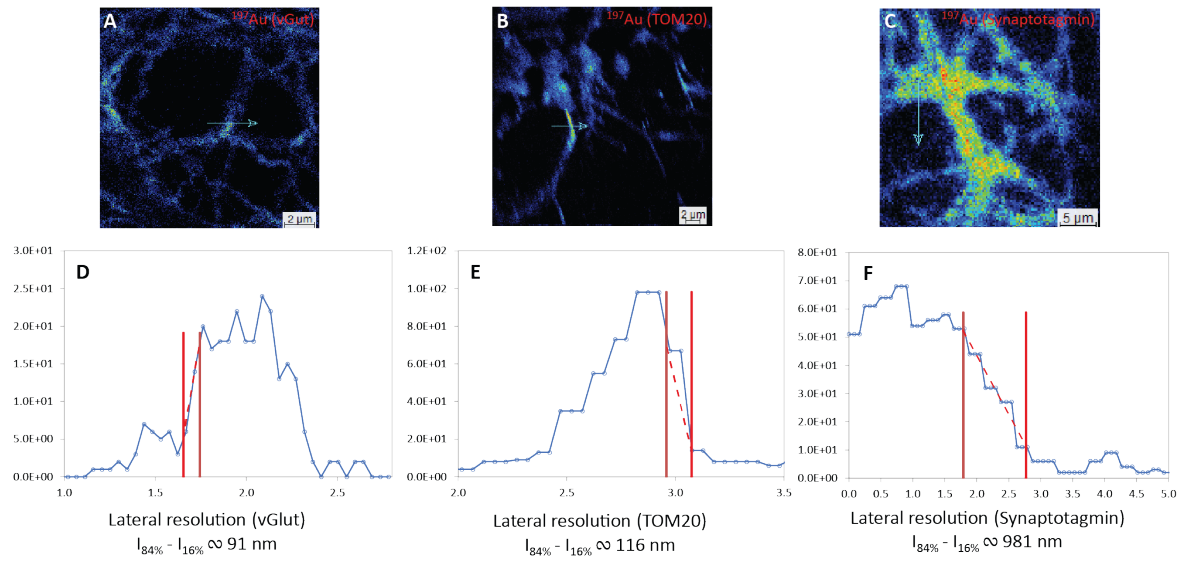


Figure S4. Confocal images of mitochondrial marker TOM20 primary mouse antibody in hippocampal neurons, which is then revealed by Cy5-anti-mouse secondary antibody. Left to right: Autofluorescence and TOM20. Scale bars are 10 μm .

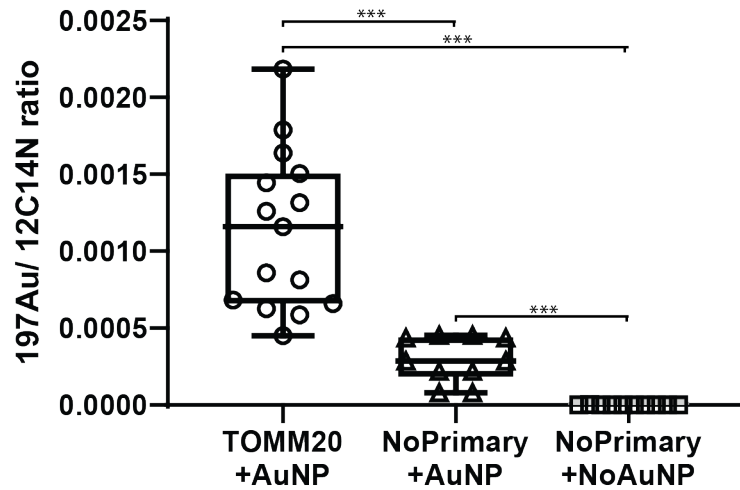


Figure S5. The chart shows a significantly higher signal of ^{197}Au signal in the neuronal cells labeled with TOM20 plus Au anti-mouse nanoprobe compared to the negative control cells labeled with Au anti-mouse antibody in the absence of primary antibody, and negative control cells labeled with neither primary antibody nor Au anti-mouse nanoprobe. The statistical analysis was performed by the Kolmogorov-Smirnov tests ($p < 0.0001$) ($n = 15$ for labelled cells, $n = 10$ for control cells). Error bars represent SEM.