

Figure S1. FCS measurement of A β 42 oligomers. FCS curve recorded in the green channel on a sample consisting of 500 nM HF488 A β 42 + 500 nM HF647 A β 42. The two shortest diffusion times were fixed to $\tau_{D1}=27 \mu\text{s}$ and $\tau_{D2}=81 \mu\text{s}$ corresponding to free dye and HF488 A β 42 monomers respectively, because the diffusion coefficient of HF488 A β 42 is about three times slower than that of the free dye HiLyte488 (Wennmalm et al, 2015). The fit yielded that 16% of the amplitude belonged to the free dye, 77% to the A β 42 monomer, and 7 % to a species of $\tau_{D3}=470 \mu\text{s}$. The slowest component indicates that a few oligomers of A β 42 are present.

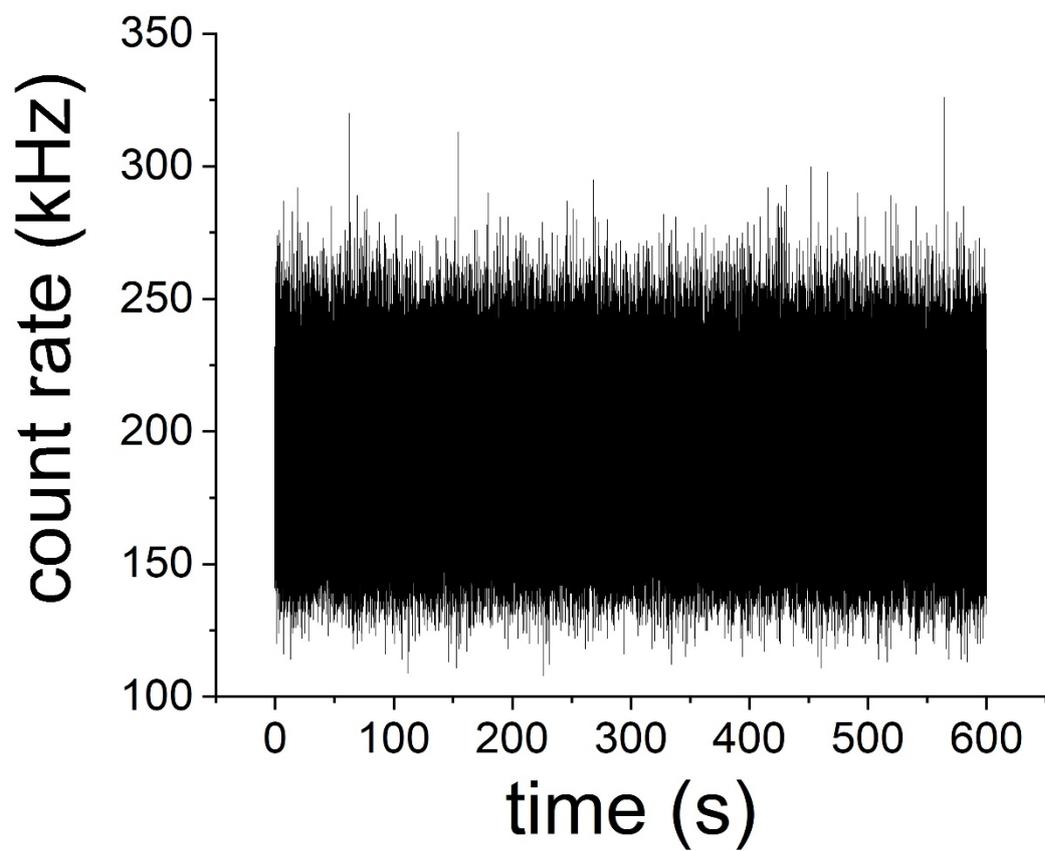


Figure S2. Intensity trace from a 10 min measurement on the same sample as in Figure S1. The lack of spikes in the intensity trace indicates that no large aggregates of A β 42 are present.

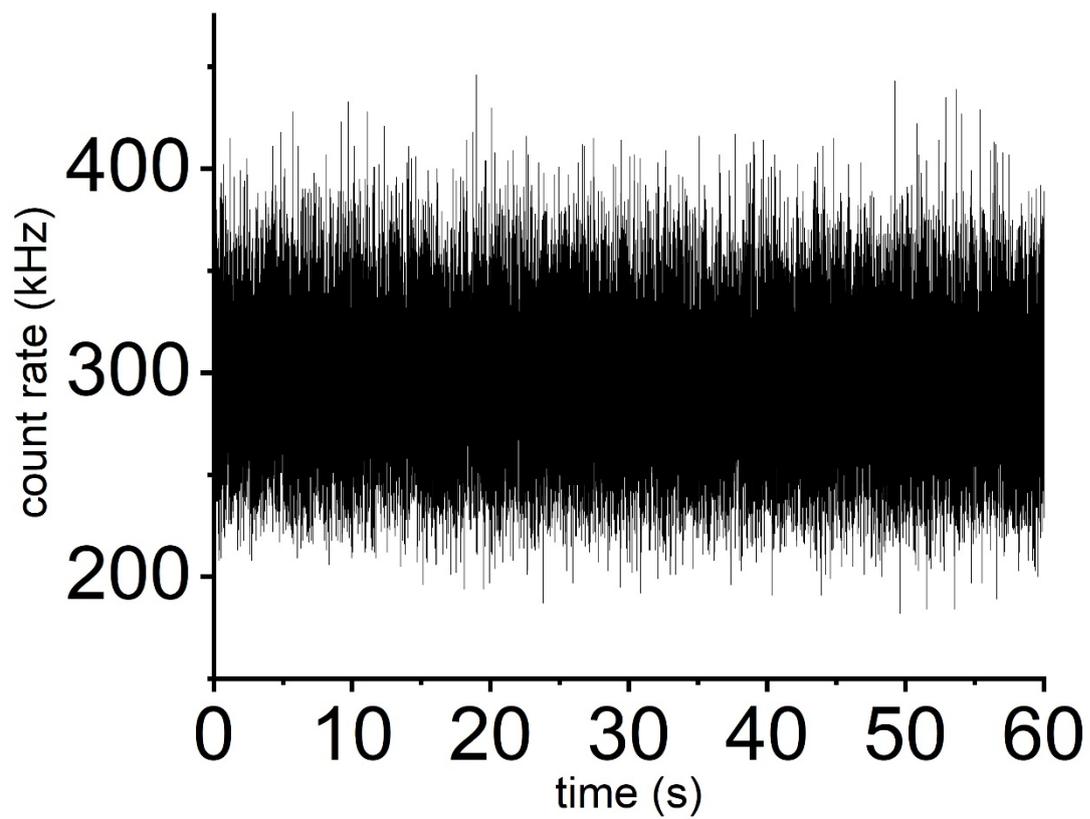


Figure S3. Intensity trace from a 60 s measurement on the same sample as in Figure S1. The lack of spikes in the intensity trace indicates that no large aggregates of A β 42 are present.

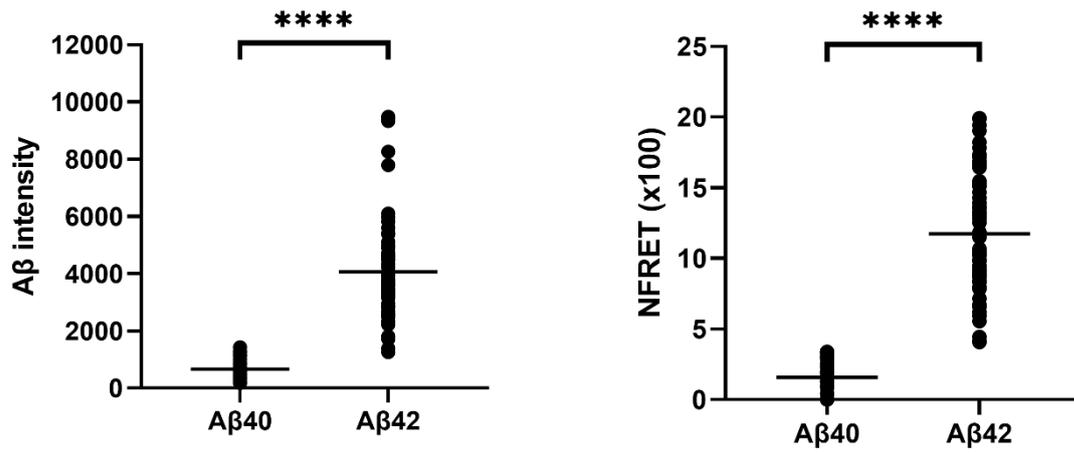


Figure S4. Comparison of primary neurons treated with 1000 nM Aβ40 or Aβ42 for 24h. Aβ intensity (HF647, left) and NFRET values (right) of Aβ vesicles in neurons treated with Aβ40 and Aβ42 were compared using Mann-Whitney test ($P < 0.0001$).