

## Supporting Information

### Controlled and Selective Photo-oxidation of Amyloid- $\beta$ Fibrils by Oligomeric *p*-Phenylene Ethynylenes

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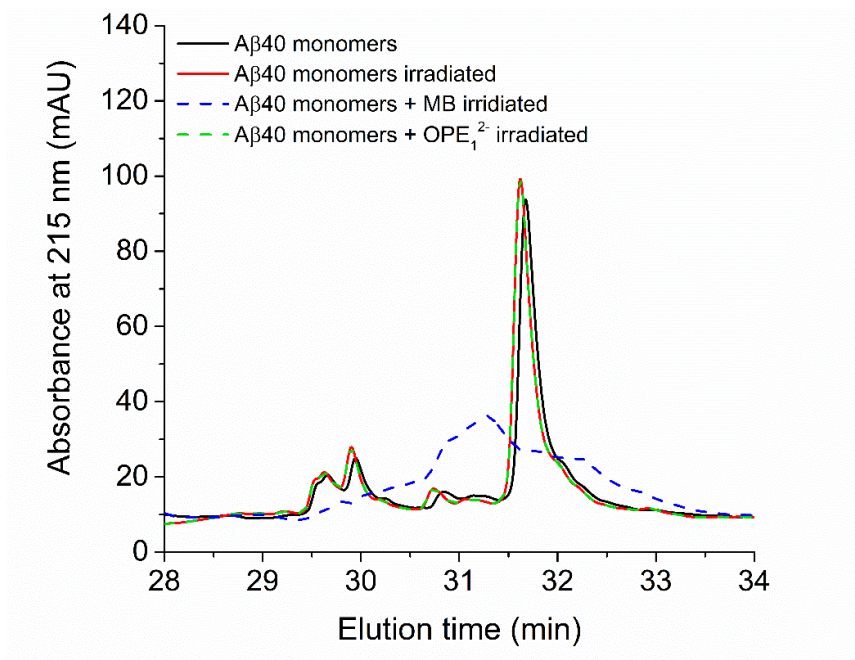
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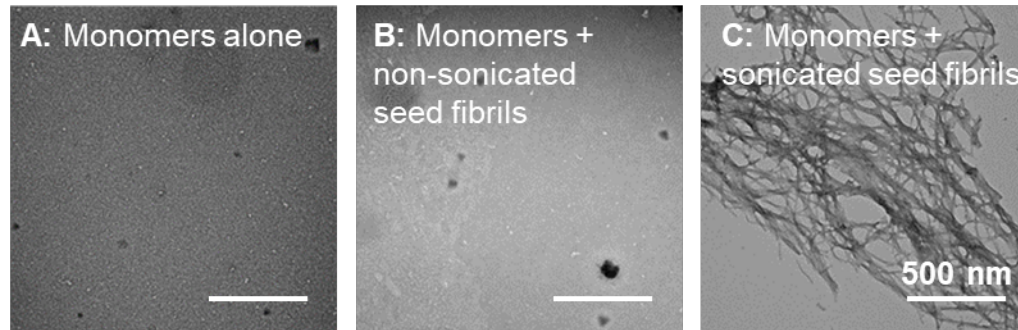
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**Figure S1:** Reverse phase HPLC chromatographs of soluble A $\beta$ 40 before and after irradiation in the presence of MB or OPE $_1^{2-}$ . Unincubated A $\beta$ 40 monomers, whether non-irradiated or irradiated in the presence of OPE $_1^{2-}$ , display a similar elution time that corresponds to 44.6-44.4% acetonitrile. When A $\beta$ 40 monomers are irradiated in the presence of MB, the elution profile of A $\beta$ 40 monomers significantly changed. The main peak eluted earlier (43.5% acetonitrile), which shows that A $\beta$ 40 peptide became more hydrophilic, which is consistently with the oxidation of the peptide. Also, the elution profile is broad with multiple peaks, indicating the presence of a several populations of A $\beta$ 40. Experimental method: The monomeric protein was analyzed by RP-HPLC on an Agilent 1100 instrument (Agilent Technology, Santa Clara, CA) before and after irradiation in the presence of OPE $_1^{2-}$  or MB (5  $\mu$ M protein with 1  $\mu$ M photosensitizer). 110  $\mu$ L of 5  $\mu$ M protein was centrifuged at 14,000 rpm for 15 minutes. The supernatant (100  $\mu$ L) was loaded onto an Eclipse XDB C18 column (Agilent Technology, Santa Clara, CA) pre-equilibrated at 40  $^{\circ}$ C with 95% of mobile phase A (water containing 0.1% TFA) and 5% of mobile phase B (acetonitrile containing 0.1% TFA). A $\beta$ 40 was eluted using a 5-100% linear gradient of mobile phase B over

40 min. The absorbance at 215 nm was monitored. Each chromatogram was background subtracted using the Agilent ChemStation software.



**Figure S2:** TEM images of A $\beta$ 40 after incubation of 50  $\mu$ M monomers either alone (A) or in the presence of 2.6  $\mu$ M non-sonicated A $\beta$ 40 fibrils (B) or 2.6  $\mu$ M sonicated A $\beta$ 40 fibrils (C). Only A $\beta$  protofibrils produced by sonication promoted fast peptide fibrillation.