

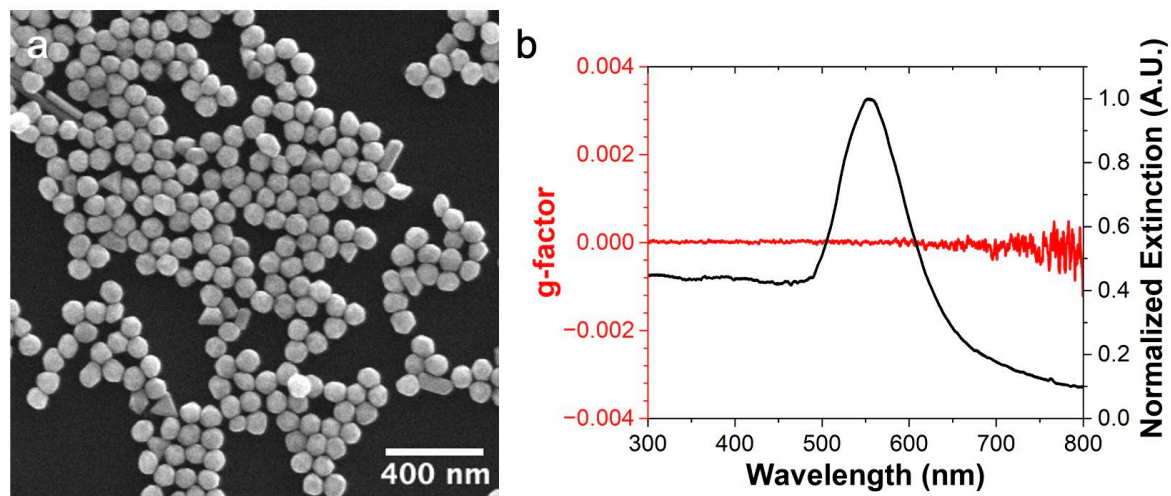
Supplementary Information  
**532- and 52-Symmetric Au Helicoids Synthesized  
Through Controlled Seed Twinning and Aspect  
Ratio**

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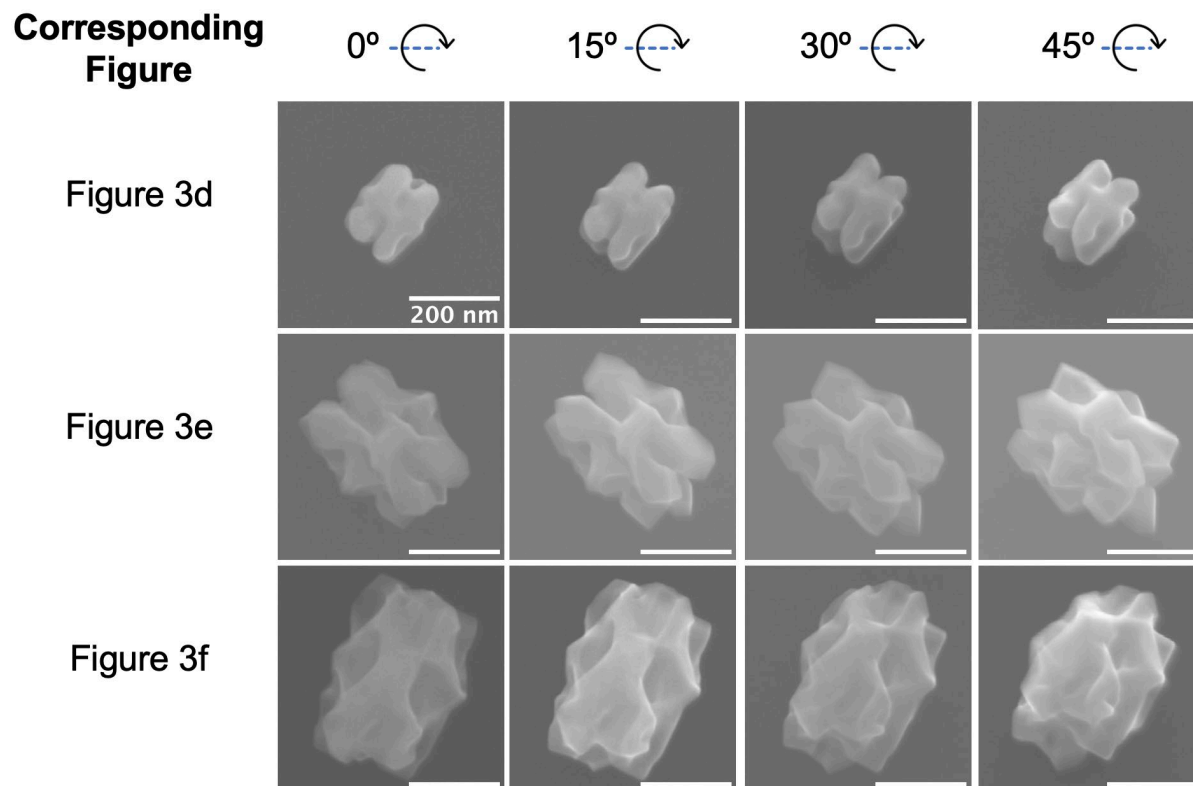
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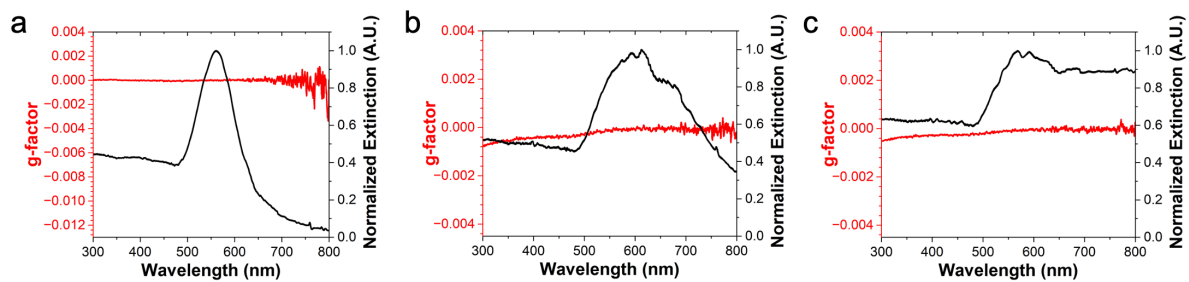
## S.1 Supporting Figures



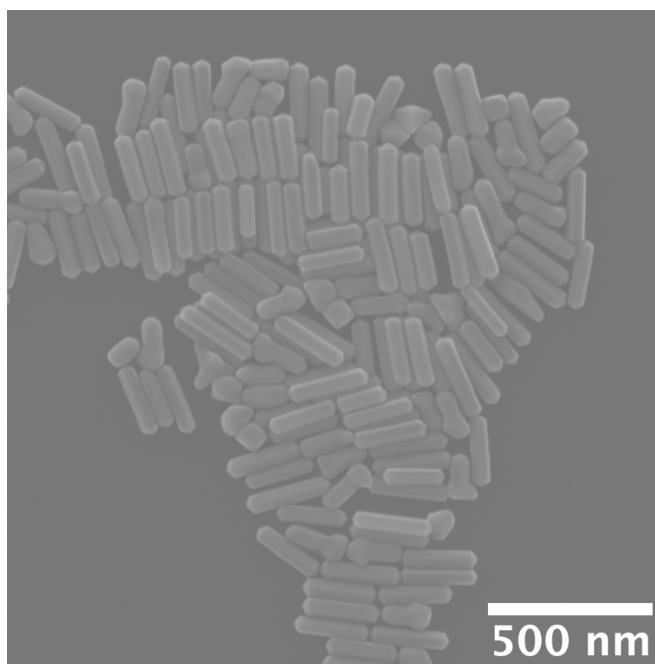
**Figure S1.** a) SEM image of icosahedral seeds for 532-helicoid synthesis. b) Graph of experimental UV-visible g-factor spectra *versus* wavelength for the icosahedral seeds.



**Figure S2.** SEM images of 52-symmetric helicoids tilted from 0-45°. Rows correspond to samples in Figure 3d-f, respectively. Scale bars: 200 nm.



**Figure S3.** Experimental optical spectra for the large pentatwinned seeds in **Figure 3a-c**, respectively.



**Figure S4.** SEM image of overgrowth products from small pentatwinned nanorods prepared without L-GSH.

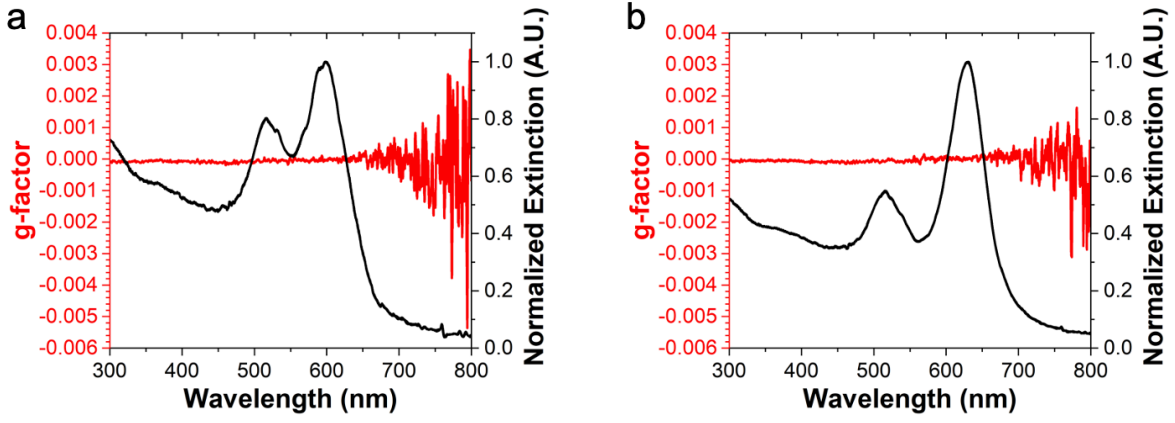


Figure S5. Optical spectra of small pentatwinned nanorod seeds in **Figure 5a-b** respectively.