

Supplemental Information

Cooperativity Between Two Selected RNA Pdases in the Synthesis of Pd Nanoparticles

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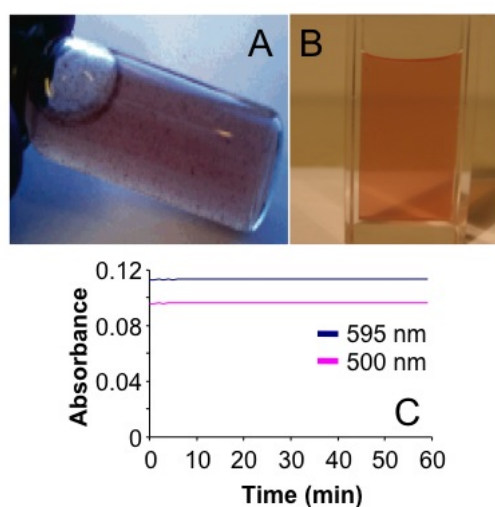


Figure S1. Comparison of aqueous/THF solutions containing $\text{Pd}_2(\text{DBA})_3$ prepared using proper and improper protocols, where “proper” is used to indicate steps taken to exclude air and purify the THF as described in the text. (A) Photograph of an improperly prepared aqueous/5% THF solution of $\text{Pd}_2(\text{DBA})_3$. Reprinted with permission from ref. 21. Copyright 2007 ACS. (B) Photograph of a properly prepared aqueous/10% THF solution of 400 μM $\text{Pd}_2(\text{DBA})_3$. (C) Visible absorbance vs. time of the solution shown in (B) monitored at two different wavelengths shows solution stability over the time course of a Pd nanoparticle synthesis experiment.

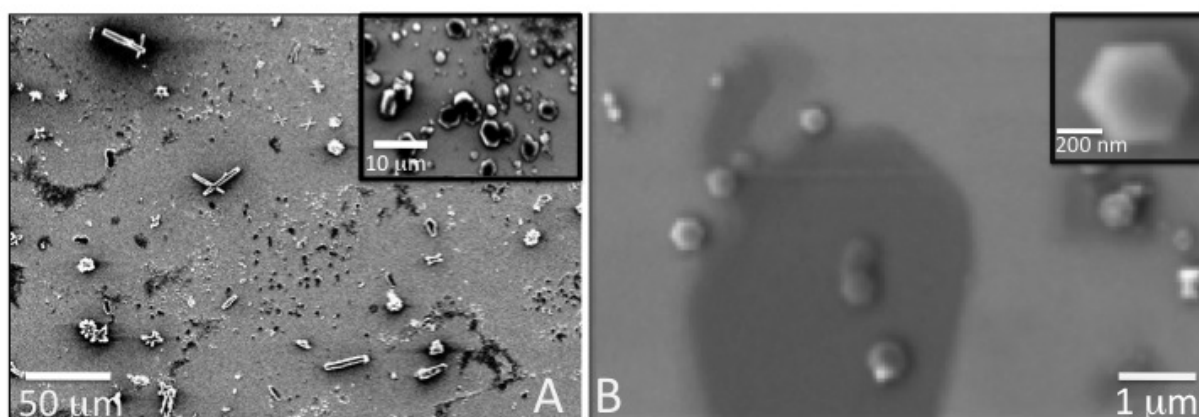


Figure S2. (A) FESEM images of material formed in a 100% THF solution containing 400 μM $\text{Pd}_2(\text{DBA})_3$. The solution was prepared under ambient conditions and open to the atmosphere (an “improperly” prepared solution), similar to solutions shown in Figure S1A. Images were captured in SEI mode. (B) FESEM images of RNA-mediated hexagonal particles synthesized from a solution as shown in Figure S1B, prepared in an oxygen-free glove box. Images were captured in LEI mode. Note the difference in material isolated using properly vs. improperly prepared solutions.

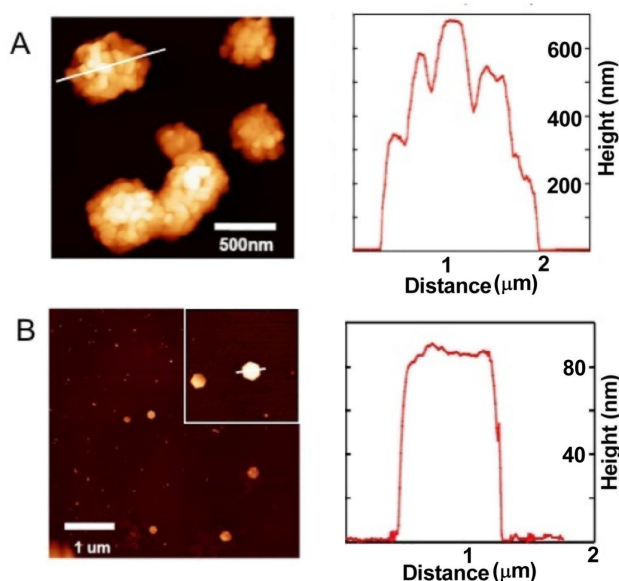


Figure S3. (A) (Left) AFM image of nanoparticles from the solution shown in Figure S1A. (Right) AFM line out showing the height and topography of the nanoparticles shown on the left. These particles were observed to be on average greater than 1 μm in width. The surface topology is quite rough and the thickness of any one of these particles can span a wide range (200 nm – 800 nm). The avg. maximum thickness of 5 particles was $910 \text{ nm} \pm 85 \text{ nm}$. (B) AFM image of RNA-mediated Pd nanoparticles formed from 400 μM $\text{Pd}_2(\text{DBA})_3$ in an aqueous 10% THF solution. (Right) AFM line out showing the height of the RNA-mediated nanoparticle in inset of left image. Note that the hexagonal particles formed by RNA mediation with Pdase 17 are strikingly different. They are much thinner (avg. of 5 particles was $78.4 \text{ nm} \pm 7.2 \text{ nm}$) and are relatively smooth (Figure 3B).