Description of Additional Supplementary Files

Supplementary Movie 1: Chemically-Powered Shape-Directed Rotation
This movie shows the steady rotation of platinum disks with twisted star shapes in 10 wt% hydrogen peroxide (Figure 1c). The shape of particles is specified by the following parameters: average radius a = 5.77 μm, thickness δ = 100 nm, number of fins n = 3, asymmetry parameter c = 2, and dimensionless fin length b = 0.3. Playback is in real time; particles rotate clockwise with a mean speed of Ω = 1.5 ± 0.2 rad s^{-1}. Scale bar is 20 μm.

Supplementary Movie 2: Shape-Directed Rotation in Particle Mixtures
This movie the steady rotation of platinum disks of different shapes in 10 wt% hydrogen peroxide (Figure 1d). Particles of different shapes rotate in different directions and at different rates in a common environment. Particles differ in the number of fins (n = 2, 3, 4) and the chiral asymmetry (c = –2, 0.5, –1, respectively); the average radius a = 5.77 μm, thickness δ = 100 nm, and dimensionless fin length b = 0.3 are the same for all particles. Playback is in real time. Scale bar is 20 μm.

Supplementary Movie 3: Rotation Reversal in CTAB Solutions
This movie the steady rotation of platinum disks with twisted star shapes in a solution containing 10 wt % hydrogen peroxide and 0.33 mM of the cationic surfactant CTAB (Figure 3b). The shape of particles is specified by the following parameters: average radius a = 5.77 μm, thickness δ = 100 nm, number of fins n = 3, asymmetry parameter c = –2, and dimensionless fin length b = 0.3. Particles rotate clockwise. Playback is sped up four times. Scale bar is 20 μm.