

## **SUPPORTING INFORMATION:**

### **OPTICAL MANIPULATION OF MICROTUBULES FOR DIRECTED BIOMOLECULE ASSEMBLY**

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- M1 Real-time images of a microtubule manipulated using the HOT system. The microtubule is manipulated in x-y-z directions.
- M2 Optical manipulation of a microtubule using the HOT system. The microtubule is captured, trapped and released under user control. The direction and the path geometry is user defined.
- M3 Optical manipulation of 3 individual microtubules. Different trap geometries and trap pathways have been designed. This demonstrates user-directed flexibility of the manipulation process.
- M4 Optical and individual manipulation of 4 microtubules-derived complexes. The complexes were moved individually and aligned on a linear path.
- M5 Optical manipulation of hybrid complexes formed from biotinylated microtubules coated with streptavidin quantum dots.
- M6 User-directed assembly formation using the HOT system. Two hybrids (one fixed and one mobile) are allowed to interact. Further manipulation of the resulting structure is next demonstrated in the trap.