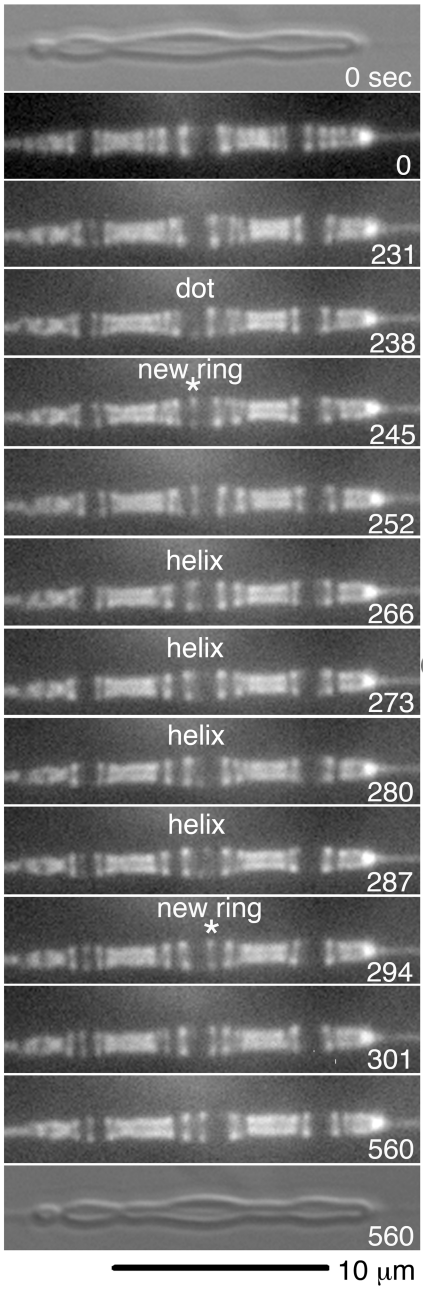
0 sec
0
231
dot
238
new ring
*
245
252
helix
266
helix
273
helix
280
helix
287
new ring
*
294
301
560
560
10 μm

Fig. S1

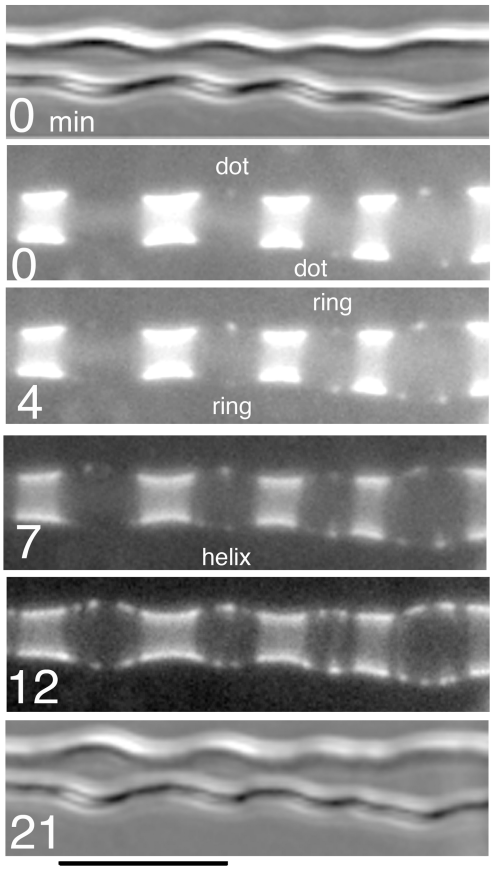

Fig. S2

Supporting Information

Fig. S1 The formation of new Z rings. Frame 238 s shows a Z ring in the process of formation, indicated by a dot on the bottom side. By 245 s this has grown into a complete ring, with a dot on both the bottom and top. Frame 266 s shows a Z ring which starts forming a helix. By 294 s the helix has completely separated and formed a new Z ring. Time 0 was 10 min after mixing FtsZ and liposomes. Supporting Information Movie S2 shows the full time period.

Fig. S2 Inside-out Z rings assembled in GMPCPP. In this example there are more empty spaces, and especially at later times the Z rings are more separated. There is less movement of Z rings toward constrictions, probably because this liposome is stuck to the glass along its whole length. One can find several examples where a new Z ring is initiated as a dot on one side, persisting tens of seconds before reaching the other side. The contrast was changed between 0 and 4 min and between 7 and 12 min. Supporting Information Movie 5 is very informative in showing newly initiated arcs and their growth into rings. Bars indicate 10 μm.

Movie S1. Inside-out Z rings constrict the tubular liposomes. This movie corresponds to Fig. 2b. It started at 10 min after the reaction was initiated. Interval is 2 s. The time indicates min:s in all movies.

Movie S2. Dynamics (formation) of inside- out Z rings on tubular liposomes. This movie corresponds to Fig. S1. It started at 10 min after the reaction was initiated. Interval is 7 s.

Movie S3. Static Z rings inside tubular liposomes, without GTP hydrolysis. This movie corresponds to Fig. 3c. It started at 10 min after the reaction was initiated. Interval is 7 s.

Movie S4. Z ring formation inside tubular liposomes, without GTP hydrolysis. This movie corresponds to Fig. 3d. It started at 10 min after the reaction was initiated. Interval is 2 s.

Movie S5. Inside-out Z ring formation in GMPCPP. This movie corresponds to Fig. S2. It started 30 min after the reaction was initiated. Interval is 2 s. This is a very informative series where the initiation of new Z rings happens relatively slowly. This liposome appears to be stuck to the glass along most of its length, and this seems to retard the closure of the Z ring. One can see several examples where a Z ring is initiated as a dot on only one side of the liposome, and does not appear as a dot on the other side for tens of seconds. Initially the two dots may oscillate back and forth from each other suggesting that they are connected by a single helical strand, perhaps across the top of the liposome. Some show a wide helical structure with two dots on one side and one dot between them on the other. Eventually most of these partial Z rings appear to close, showing two dots of relatively equal intensity on both sides, and with much more

restricted lateral excursions. This suggested that the Z rings are able to grow around the liposome where it is attached to the glass, but growth there is slowed, leaving partial Z rings to persist for a longer time.