Supplemental Table 1. Effects of Bim1 on microtubule dynamics at 11.5 μM tubulin

	Bim1 concentration			
	0 μM	0.1 μM	0.5 μM	1 μM
Plus Ends				
MTs/axoneme end				
MT number	2.18 ±1.38	4.17 ± 1.54	8.09 ± 1.92	8.36 ± 1.08
MT length	5.46 ± 2.74 (20)	8.13 ± 3.27 (10)	15.19 ±1.46 (8)	18.19 ± 2.00 (10)
MT length/axoneme	11.90 ± 9.62	33.90 ± 18.51	122.9 ± 31.5	152.1 ± 25.8
Rates (μm/min)				
Growth	1.87 ± 0.29 (59)	1.98 ± 0.25 (68)	2.56 ± 0.24 (27)	2.93 ± 0.24 (45)
Shrinkage	40.65 ± 11.18 (23)	18.65 ± 5.81 (24)	*	*
Frequencies (min^{-1})				
Catastrophe	0.32 ± 0.06 (26)	0.13 ± 0.03 (24)	<0.01 (0)	<0.01 (0)
Rescue	<0.28 (0)	0.51 ± 0.25 (4)	*	*
Total time (min)				
Growth	82.15	181.0	74.5	143.8
Shrinkage	3.53	7.90	0	0
Total MT number	89	85	97	144
Minus Ends				
MTs/axoneme end				
MT number	1.79 ± 1.06	3.43 ± 2.08	7.40 ± 1.40	6.36 ± 1.57
MT length	2.46 ± 1.36 (24)	4.46 ± 0.98 (10)	7.40 ± 1.70 (5)	9.64 ± 2.20 (12)
MT length/axoneme	4.40 ± 3.57	15.30 ± 9.79	54.76 ± 16.30	61.31 ± 20.61
Rates (μm/min)				
Growth	0.90 ± 0.21 (43)	0.99 ± 0.21 (57)	1.51 ± 0.22 (24)	1.61 ± 0.19 (32)
Shrinkage	49.83 ± 11.58 (12)	15.55 ± 6.16 (11)	*	*
Frequencies (min^{-1})				
Catastrophe	0.27 ± 0.07 (14)	0.06 ± 0.02 (11)	<0.01 (0)	<0.01 (0)
Rescue	1.96 ± 1.39 (2)	3.33 ± 1.36 (6)	*	*
Total time (min)				
Growth	51.93	193.1	74.18	140.4
Shrinkage	1.17	1.8	0	0
Total MT number	68	81	75	83

Data are mean ± SD. Values in parentheses are the number of events.

* No catastrophes events were observed, so shrinkage rates and rescue frequencies could not be determined.

Supplemental Table 2. Effects of Bik1 on microtubule dynamics at 11.5 μM tubulin

	Bik1 concentration			
	0 μM	0.1 μM	0.5 μM	1 μM
Plus Ends				
MTs/axoneme end				
MT number	2.18 ±1.38	2.19 ± 0.85	1.84 ± 1.34	1.00 ± 0.88
MT length	5.46 ± 2.74 (20)	5.01 ± 1.61 (10)	3.68 ± 2.76 (11)	2.98 ± 1.42 (11)
MT length/axoneme	11.90 ± 9.62	10.97 ± 5.53	6.77 ± 7.08	2.98 ± 2.98
Rates (μm/min)				
Growth	1.87 ± 0.29 (59)	1.78 ± 0.25 (41)	1.69 ± 0.25 (39)	1.54 ± 0.25 (30)
Shrinkage	40.65 ± 11.18 (23)	47.72 ± 12.25 (20)	33.65 ± 8.66 (17)	34.63 ± 12.21 (18)
Frequencies (min^{-1})				
Catastrophe	0.32 ± 0.06 (26)	0.36 ± 0.08 (20)	0.38 ± 0.09 (19)	0.44 ± 0.10 (18)
Rescue	<0.28 (0)	<0.43 (0)	<0.41 (0)	0.43 (1)
Total time (min)				
Growth	82.15	55.68	49.40	40.88
Shrinkage	3.53	2.30	2.43	2.35
Total MT number	89	46	41	36
Minus Ends				
MTs/axoneme end				
MT number	1.79 ± 1.06	1.71 ± 0.80	0.82 ± 0.78	0.42 ± 0.64
MT length	2.46 ± 1.36 (24)	1.23± 0.61 (6)	1.12 ± 0.51 (5)	0.74 ± 0.15 (5)
MT length/axoneme	4.40 ± 3.57	2.10 ± 1.43	0.92 ± 0.97	0.31 ± 0.48
Rates (μm/min)				
Growth	0.90 ± 0.21 (43)	0.84 ± 0.23 (20)	0.72 ± 0.15 (8)	0.51 ± 0.15 (7)
Shrinkage	49.83 ± 11.58 (12)	43.26 ± 9.02 (7)	35.51 ± 9.99 (4)	36.74 ± 8.62 (5)
Frequencies (min^{-1})				
Catastrophe	0.27 ± 0.07 (14)	0.32 ± 0.12 (7)	0.51 ± 0.25 (4)	0.69 ± 0.31 (5)
Rescue	1.96 ± 1.39 (2)	<1.92 (0)	<4.00 (0)	<4.50 (0)
Total time (min)				
Growth	51.93	21.90	7.87	7.22
Shrinkage	1.17	0.52	0.25	0.22
Total MT number	68	24	14	10

Data are mean ± SD. Values in parentheses are the number of events.

Supplemental Table 3. Effects of Bik1 on microtubule dynamics at 14.0 μM tubulin

	Bik1 concentration			
	0 μM	0.1 μM	0.5 μM	1 μM
Plus Ends				
MTs/axoneme end				
MT number	4.08 ± 1.26	2.73 ±1.12	2.44 ± 1.21	1.93 ± 0.92
MT length	13.22 ± 1.81 (6)	5.17 ± 1.45 (7)	3.68 ± 1.82 (8)	3.72 ± 1.56 (9)
MT length/axoneme				
Rates (μm/min)				
Growth	3.07 ± .21 (22)	2.18 ± 0.22 (22)	1.79 ± .1 (10)	1.53 ± .12 (19)
Shrinkage	*	61.51 ± 16.88 (7)	41.33 ± 11.26 (6)	47.45 ± 17.9 (6)
Frequencies (min^{-1})				
Catastrophe	<0.03 (0)	0.21 ± 0.07 (9)	0.26 ± 0.1 (7)	0.32 ± 0.11 (8)
Rescue	*	<1.25 (0)	<1.03 (0)	<1.72 (0)
Total time (min)				
Growth	31.75	42.02	26.88	24.88
Shrinkage	0.00	0.8	0.97	0.58
Total MT number	49	41	44	29
Minus Ends				
MTs/axoneme end				
MT number	3.27 ± 1.14	1.93 ± 1.53	2.07 ± 1.22	1.88 ± 0.83
MT length	6.79 ± 2.15 (8)	1.94 ± 0.72 (7)	1.81 ± 0.81 (7)	1.24 ± 0.76 (6)
MT length/axoneme				
Rates (μm/min)				
Growth	1.93 ± 0.12 (12)	1.04 ± 0.18 (25)	0.79 ± 0.12 (10)	0.76 ± 0.21 (10)
Shrinkage	*	41.16 ± 10.91 (5)	40.75 ± 3.01 (4)	32.49 ± 8.39 (5)
Frequencies (min^{-1})				
Catastrophe	<0.03 (0)	0.20 ± 0.08 (6)	0.28 ± 0.13 (5)	0.37 ± 0.15 (6)
Rescue	*	<3.03 (0)	<3.03 (0)	1.36 (1)
Total time (min)				
Growth	29.97	22.05	17.82	16.03
Shrinkage	0.00	0.33	0.33	0.73
Total MT number	36	27	29	15

Data are mean ± SD. Values in parentheses are the number of events.

***** No catastrophes events were observed, so shrinkage rates and rescue frequencies could not be determined.

Supplemental Table 4. Combined effects of Bim1 and Bik1 on microtubule dynamics at 11.5 μM tubulin

[Bik1]	0 μM	0.1 μM	1.0 μM	1.0 μM	1.0 μM
[Bim1]	0 μM	0.1 μM	1.0 μM	0.5 μM	0.1 μM
Plus Ends					
MT length/axoneme					
MT number	2.18 ±1.38	4.70 ± 1.70	8.44 ± 2.01	5.25 ± 2.12	3.00 ± 1.48
MT length	5.46 ± 2.74 (20)	9.45 ± 3.06	16.86 ± 2.38 (25)	9.32 ± 2.31 (13)	5.47 ± 2.13 (13)
MT length/axonem	11.90 ± 9.62	44.42 ± 21.56	142.3 ± 39.4	48.93 ± 23.18	16.41 ± 10.31
Rates (μm/min)					
Growth	1.87 ± 0.29 (59)	1.94 ± 0.28 (42)	2.89 ± 0.38 (57)	1.87 ± 0.36 (34)	1.70 ± 0.19 (29)
Shrinkage	40.65 ± 11.18 (23)	16.98 ± 4.38 (10)	*	6.61 ± 1.12 (10)	9.28 ± 3.80 (7)
Frequencies (min^{-1})					
Catastrophe	0.32 ± 0.06 (26)	0.09 ± 0.03 (10)	<0.01 (0)	0.10 ± 0.04 (10)	0.16 ± 0.06 (7)
Rescue	<0.28 (0)	0.77 ± 0.55 (2)	*	0.62 ± 0.27 (5)	1.41 ± 0.71 (4)
Total time (min)					
Growth	82.15	106.8	150.2	104.1	45.05
Shrinkage	3.53	2.58	0	8.12	2.83
Total MT number	89	63	106	59	33
Minus Ends					
MT length/axoneme					
MT number	1.79 ± 1.06	5.12 ± 1.54	6.86 ± 1.12	4.60 ± 2.10	2.82 ± 0.87
MT length	2.46 ± 1.36 (24)	4.64 ± 0.95	7.76 ± 1.31 (24)	4.46 ± 1.45 (25)	2.91 ± 0.79 (9)
MT length/axonem	4.40 ± 3.57	23.76 ± 8.64	53.23 ± 12.50	20.52 ± 11.50	8.21 ± 3.37
Rates (μm/min)					
Growth	0.90 ± 0.21 (43)	1.02 ± 0.2 (33)	1.49 ± 0.20 (52)	0.93 ± 0.23 (35)	0.82 ± 0.18 (23)
Shrinkage	49.83 ± 11.58 (12)	*	*	6.63 ± 1.31 (3)	8.24 (1)
Frequencies (min^{-1})					
Catastrophe	0.27 ± 0.07 (15)	<0.01 (0)	<0.01 (0)	0.02 ± 0.01 (3)	0.02 (1)
Rescue	1.96 ± 1.39 (2)	*	*	0.95 ± 0.67 (2)	8.57 (1)
Total time (min)					
Growth	51.93	92.90	95.68	138.2	49
Shrinkage	1.17	0	0	2.12	0.12
Total MT number	67	61	80	60	35

Data are mean ± SD. Values in parentheses are the number of events.

* No catastrophe events were observed, so shrinkage rates and rescue frequencies could not be determined.