

How non-bonding domains affect the active assembly of microtubule spools

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Supporting information

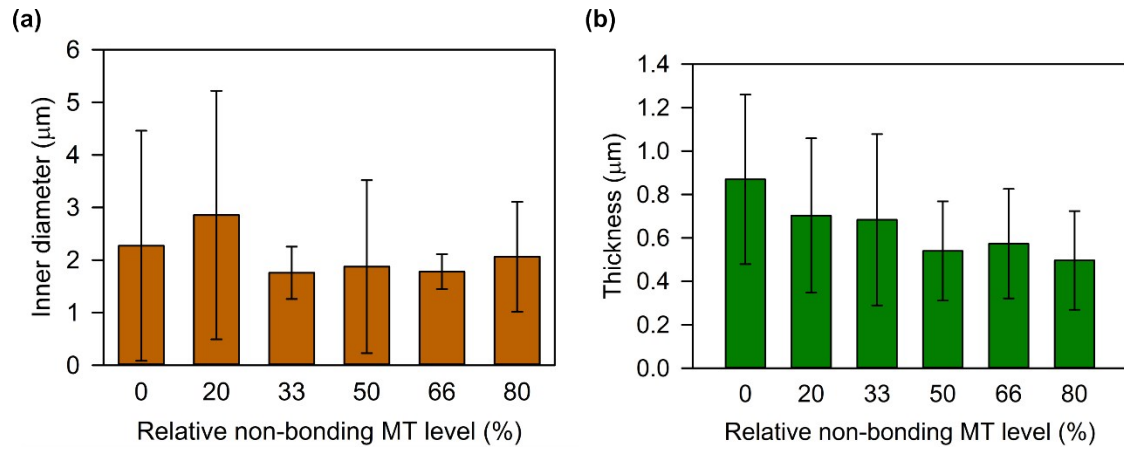


Fig. S1. (a) Average inner diameter of spools for each non-bonding MT level. (b) Average thickness of spools as measured by the difference between outer and inner radii. Number of measurements (n) was 98, 101, 44, 29, 20, and 26 for 0, 20, 33, 50, 66, and 80% levels of non-bonding MTs, respectively. Error bars= standard deviation.

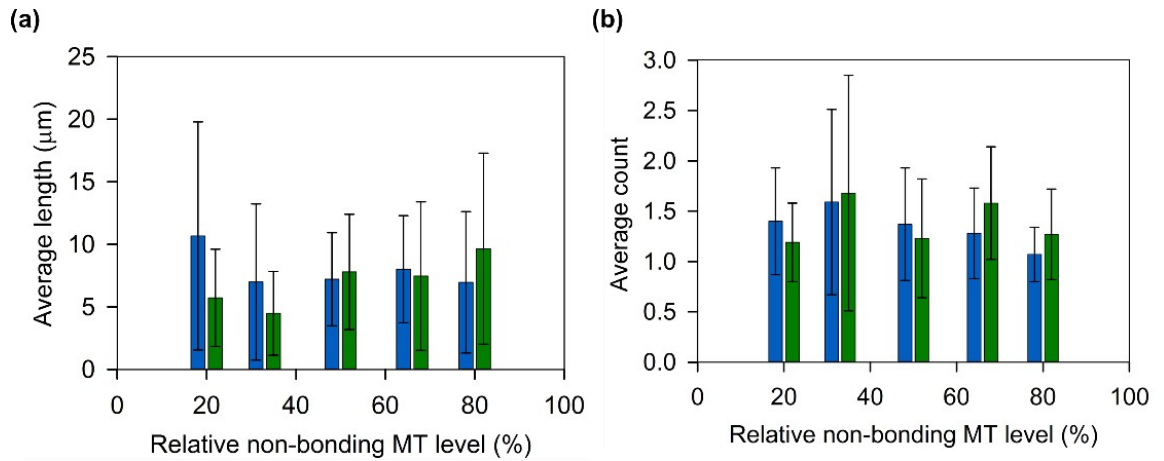


Fig. S2. Average (a) length and (b) count of bonding (blue bars) and non-bonding (green bars) domains in segmented MTs as a function of percent non-bonding MT level. Number of measurements for (a): blue bars =80, 70,70, 69 ,81 and green bars=68, 73, 64, 90, 95 for 0, 20, 33,50, 66, and 80% levels of non-bonding MTs, respectively. Number of measurements for (b) for blue and green was 7,44, 51, 56, 76 for 0, 20, 33,50, 66, and 80% levels of non-bonding MTs, respectively. Error bars = standard deviation. No significant differences in the average lengths and counts were observed.

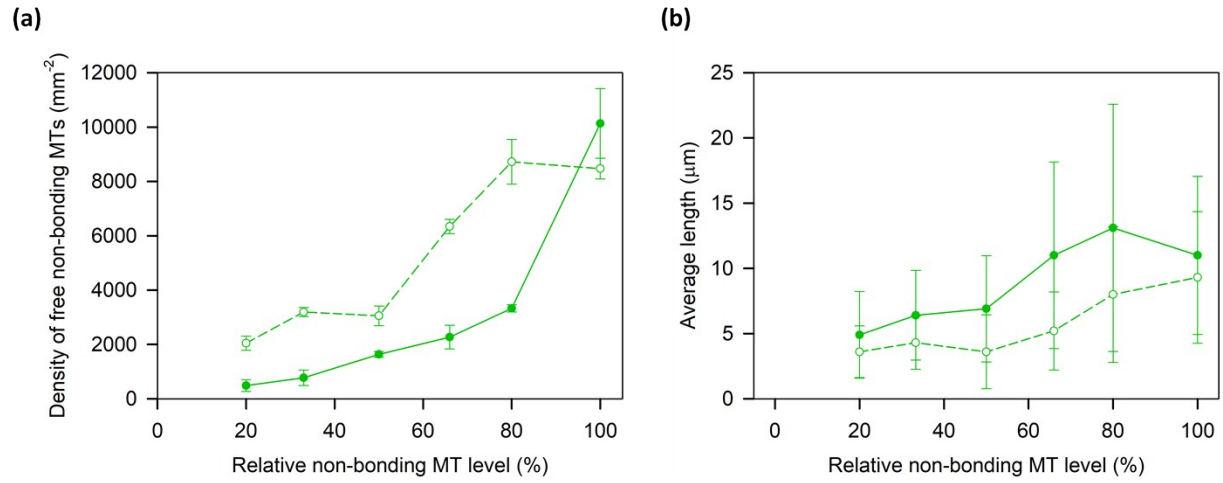


Fig. S3. The average density and length of free non-bonding MTs (i.e., not in spools) as a function of percent non-bonding MTs. (a) average density and (b) length were measured prior to (solid lines/closed circles, $t=0$) and after adding sQDs (dashed lines/open circles, $t=30\text{min}$) for non-bonding MTs. Number of measurements for each data point in (a) was 5 images. Number of measurements for (b) was: (i) solid line= 44,74,104,142,111,102; dashed line = 98,104,89,100,108,102 for 0, 20, 33,50, 66, and 80% levels of non-bonding MTs, respectively. Error bars= standard deviation.

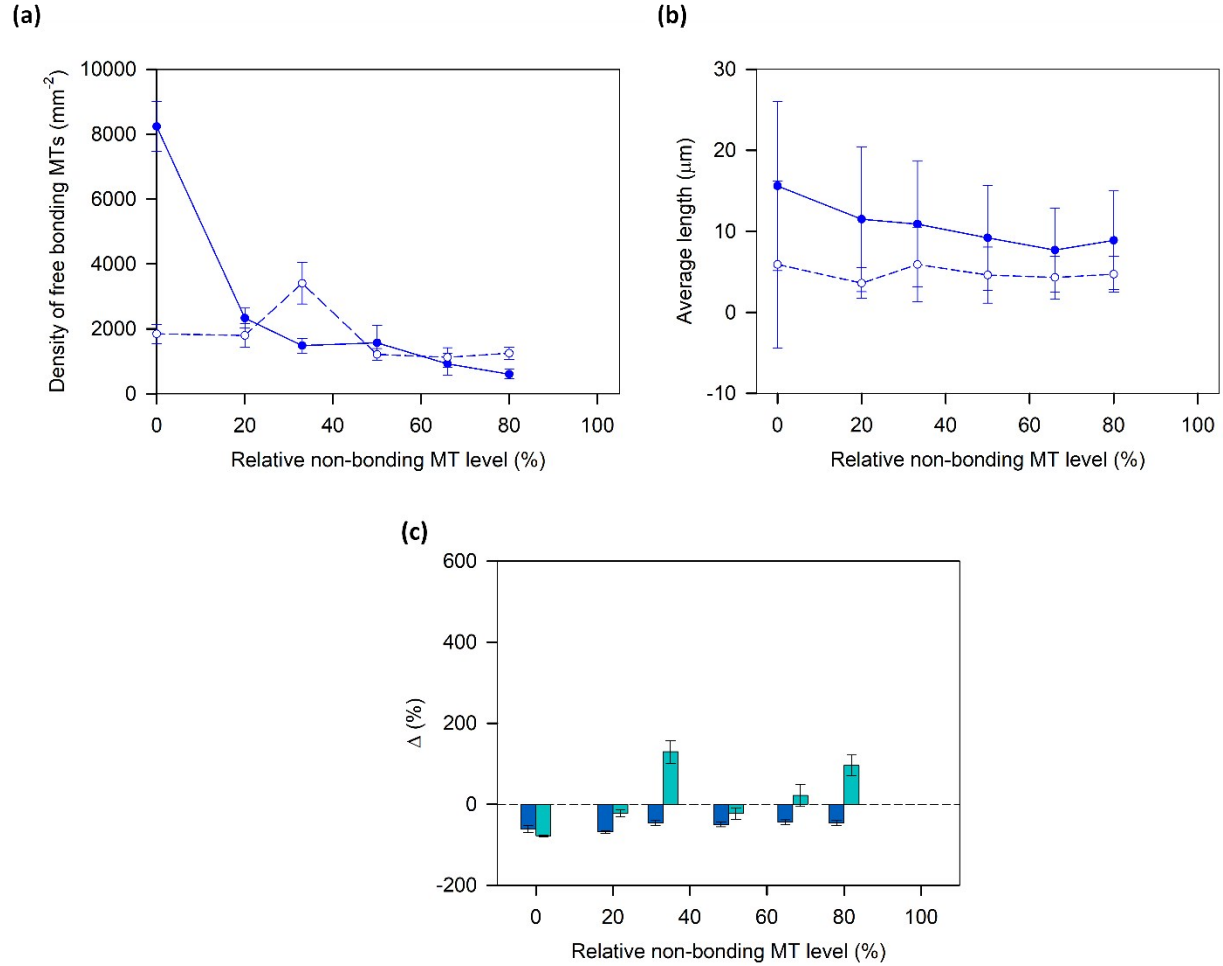


Fig. S4. The average density and length of bonding MTs as a function of non-bonding MT level. Average (a) density and (b) length were measured prior to (solid lines/closed circles, $t=0$) and after adding sQDs (dashed lines/open circles, $t=30$ min) for bonding MTs. Number of measurements for each data point in (a) was 5-6 images. Number of measurements for (b) was: (i) solid line = 90,80,74,85,74,58; dashed line = 74,88,129,75,77,54 for 0, 20, 33,50, 66, and 80% levels of non-bonding MTs, respectively. Error bars for (a) and (b)= standard deviation. (c) Change in the average density (■) and length (■) of unincorporated bonding MTs as a function of the non-bonding defective MT level. Changes in density were calculated as $\Delta D = (D_{30} - D_0)/D_0 * 100$; changes in length were calculated using the same formula. Number of measurements is the same as (a) and (b). Error bars= standard error of the mean.

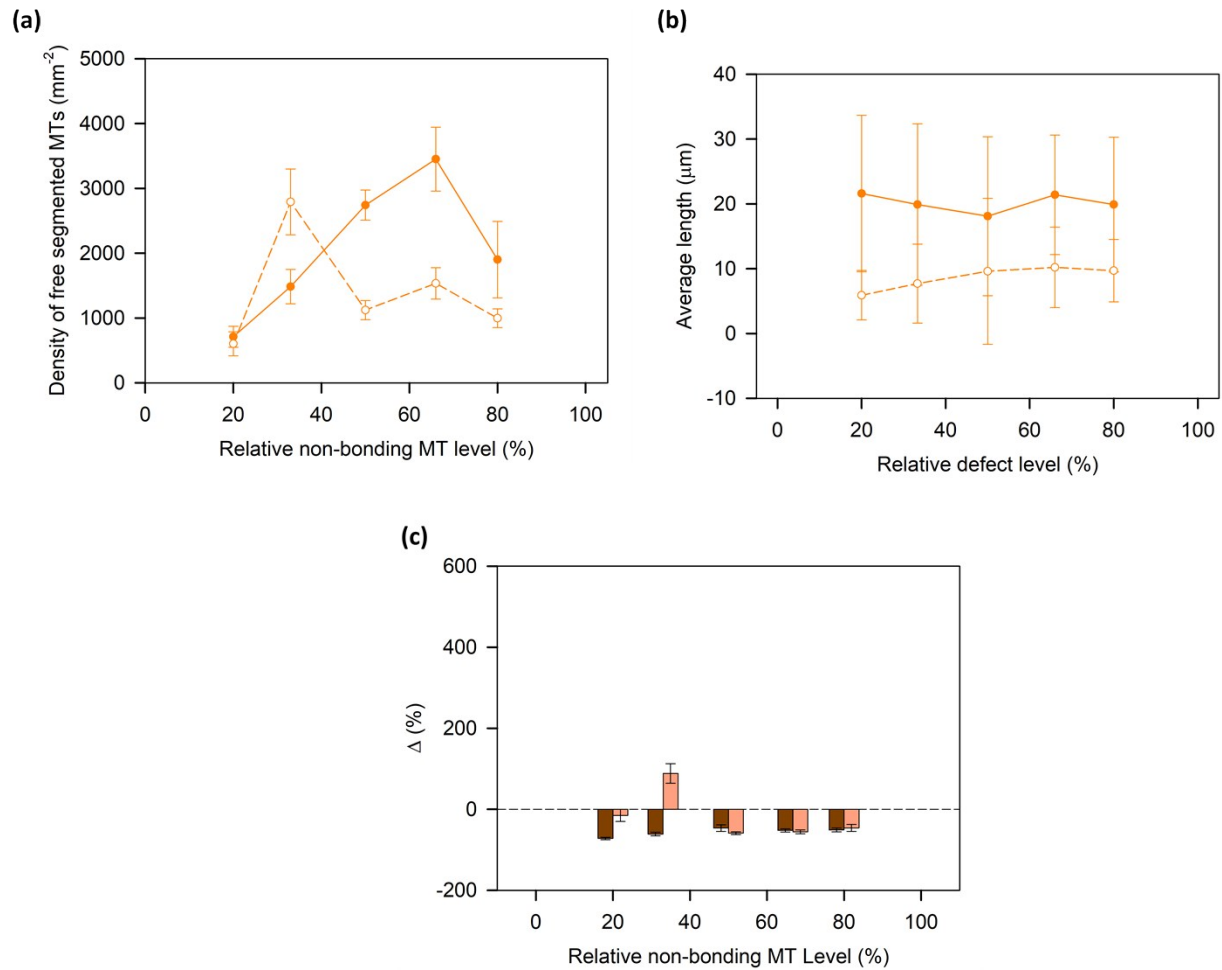


Fig. S5. The average density and length of segmented MTs as a function of non-bonding MT percent. Average (a) density and (b) length were measured prior to (solid lines/closed circles, $t=0$) and after adding QDs (dashed lines/open circles, $t=30$ min) for segmented MTs. Number of measurements for each data point in (a) was 5-6 images. Number of measurements for (b) was: (i) solid line=57,69,89,105,75; dashed line =58,76,75,79,47 for 0, 20, 33,50, 66, and 80% levels of non-bonding MTs, respectively. Error bars for (a) and (b)= standard deviation. (c) Change in the average density (■) and length (■) of segmented MTs as a function of the non-bonding defective MT level. Number of measurements is the same as (a) and (b). Error bars= standard error of the mean.