

Supplementary material

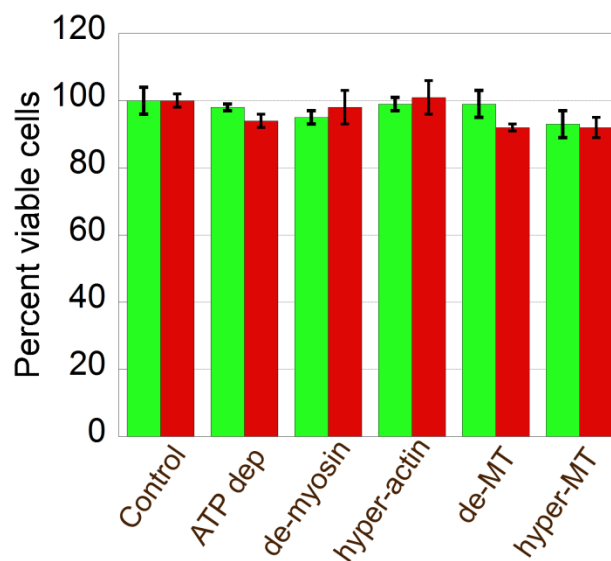


Figure S1. Relative viability of low MP (green bar) and high MP (red bar) cells 6 hours after treatments. Alamar Blue (BUF012A, AbD Serotec-MorphoSys, Germany) stain for metabolic activity was used as an indicator for cell viability (n=9).

Fluorescent staining and imaging. We have stained the actin, MTs, and nuclei of fixated cells. Cells were fixated with 3.2% Paraformaldehyde (PFA, Electron Microscopy Sciences, Hatfield, PA) in PBS for 20 minutes at 4°C, then permeabilized with 0.5% Triton X-100 (A.R., Bio Lab, Israel) for 5 minutes at room temperature, and blocked with 3% FBS for 10 minutes at room temperature. F-actin and α -tubulin were stained with a mixture of phalloidin-FITC (20 μ g/ml, Sigma, St. Louis, MO) and mouse anti- α -tubulin monoclonal antibody (clone DM1A, 1.1 μ g/ml, Sigma, St. Louis, MO), respectively. The nuclei were stained with 4'-6-diamidino-2-phenylindole (DAPI, Sigma, St. Louis, MO) in parallel with MT secondary cy3-labeled goat anti-mouse IgG antibody (Jackson Immuno Research, West Grove, PA). Slides were stabilized with Fluoromount G (Southern Biotech, Birmingham, AL) according to manufacturer protocol. The specimens were imaged with a spectral-imaging Zeiss LSM700 confocal system, mounted on a motorized Axio Observer Z1 microscope, using an x63/1.4 NA oil objective.

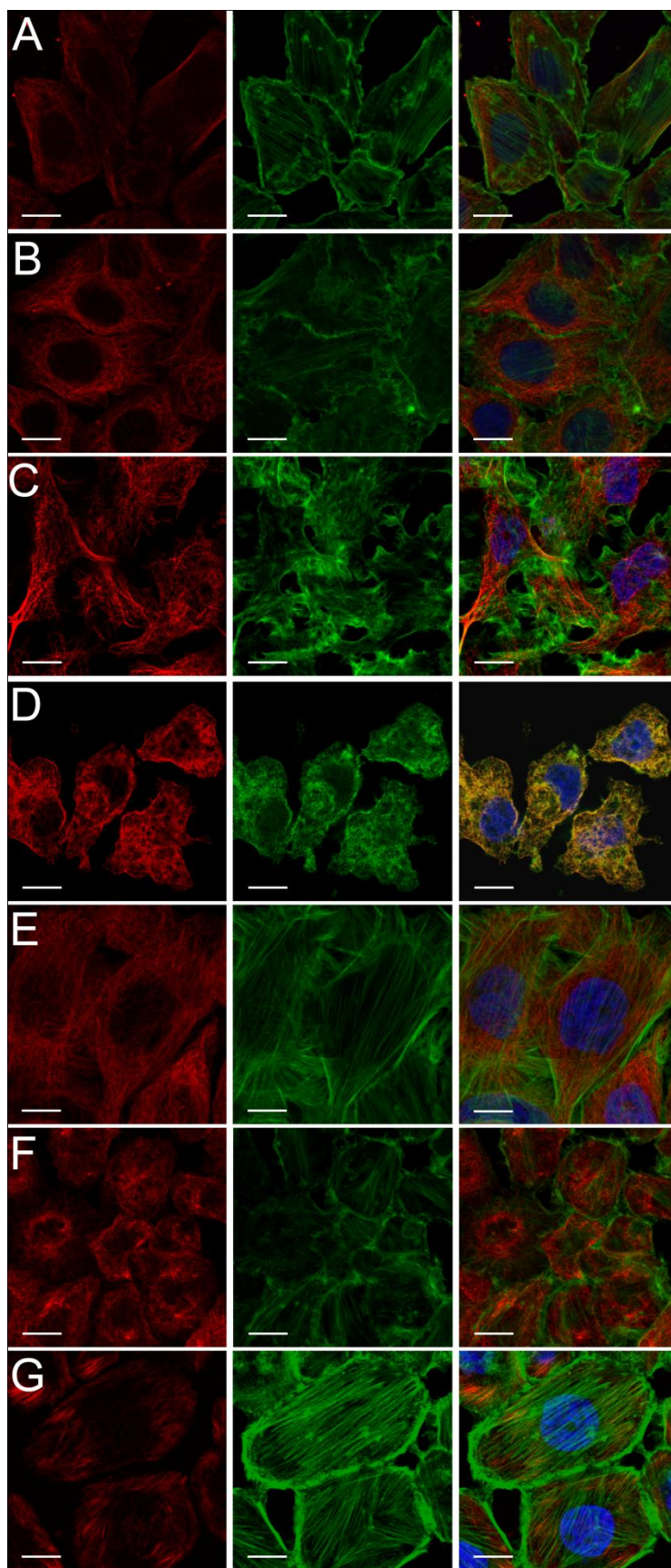


Figure S2. Cytoskeleton structure of low MP cells. (left) Microtubules, (mid) actin, (right) merge with nucleus. (A) control; (B) ATP dep; (C) de-myosin; note blebbing phenomenon occurring in the cells, where only actin is in the blebs. (D) de-actin; (E) hyper-actin; (F) de-MT; (G) hyper-MT. Scale bars are 10 μm

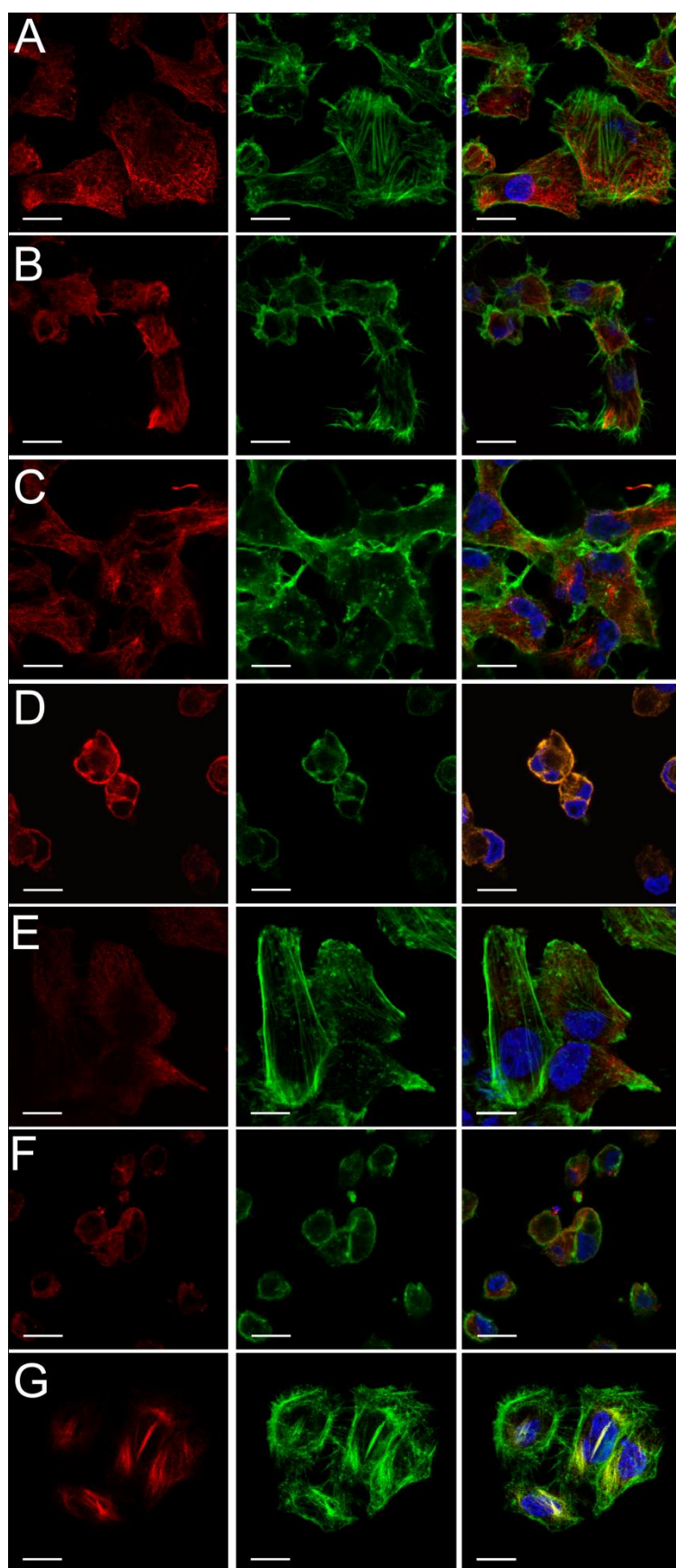


Figure S3. Cytoskeleton structure of high MP cells. (left) Microtubules, (mid) actin, (right) merge with nucleus. (A) control; (B) ATP dep; (C) de-myosin; (D) de-actin; (E) hyper-actin; (F) de-MT; (G) hyper-MT. Scale bars are 10 μm

Table S1. Scaling parameters of the categorized, ensemble-averaged MSD fit to $\langle \Delta r^2(\tau) \rangle = A \tau^\alpha$ at different timescales^a

$\tau < 0.1$ sec				
	MSD scaling exponent		MSD pre-factor ($\mu\text{m}^2/\text{sec}$)	
	Low MP cells	High MP cells	Low MP cells	High MP cells
Control	1.18	1.30	5.4×10^{-3}	1.7×10^{-2}
ATP dep	0.61	0.97	1.1×10^{-3}	0.5×10^{-2}
De-myosin	1.23	1.31	7.3×10^{-3}	2.2×10^{-2}
De-actin	1.14	1.23	7.3×10^{-3}	1.7×10^{-2}
Hyper-actin	1.23	1.31	6.0×10^{-3}	1.5×10^{-2}
De-MT	1.14	1.26	4.5×10^{-3}	2.2×10^{-2}
Hyper-MT	1.20	1.18	3.8×10^{-3}	0.7×10^{-2}

$0.2 \text{ sec} < \tau < 2 \text{ sec}$				
	MSD scaling exponent		MSD pre-factor ($\mu\text{m}^2/\text{sec}$)	
	Low MP cells	High MP cells	Low MP cells	High MP cells
Control	1.32	1.38	7.5×10^{-3}	2.1×10^{-2}
ATP dep	0.68	1.17	1.1×10^{-3}	0.7×10^{-2}
De-myosin	1.36	1.35	10.0×10^{-3}	2.7×10^{-2}
De-actin	1.32	1.29	10.0×10^{-3}	2.1×10^{-2}
Hyper-actin	1.36	1.34	8.3×10^{-3}	1.8×10^{-2}
De-MT	1.30	1.49	6.1×10^{-3}	3.9×10^{-2}
Hyper-MT	1.22	1.52	3.8×10^{-3}	1.5×10^{-2}

$\tau > 3 \text{ sec}$				
	MSD scaling exponent		MSD pre-factor ($\mu\text{m}^2/\text{sec}$)	
	Low MP cells	High MP cells	Low MP cells	High MP cells
Control	0.80	0.77	12.0×10^{-3}	3.3×10^{-2}
ATP dep	0.92	0.80	0.8×10^{-3}	1.0×10^{-2}
De-myosin	0.83	0.98	16.0×10^{-3}	3.3×10^{-2}
De-actin	1.01	0.91	13.0×10^{-3}	2.6×10^{-2}
Hyper-actin	0.83	0.90	13.0×10^{-3}	2.3×10^{-2}
De-MT	0.88	1.0	8.6×10^{-3}	5.0×10^{-2}
Hyper-MT	0.88	1.1	5.1×10^{-3}	2.1×10^{-2}

^a Fits were weighted towards shorter lag-times where data is more statistically reliable

Table S2. Fits of the scaling exponents of the displacements for powers $0 \leq q \leq 8$

Low MP cells			
	Lower powers	Intercept	Higher powers
Control	$\lambda(q)=0.65q-0.002$	2	$\lambda(q)=0.73q-0.1$
ATP dep	$\lambda(q)=0.31q-0.0003$	1.75 ^a	$\lambda(q)=0.4q-0.1$
De-myosin	$\lambda(q)=0.66q-0.003$	2	$\lambda(q)=0.76q-0.2$
De-actin	$\lambda(q)=0.64q+0.001$	3.5	$\lambda(q)=0.99q-1.2$
Hyper-actin	$\lambda(q)=0.64q-0.001$	1.5	$\lambda(q)=0.75q-0.2$
De-MT	$\lambda(q)=0.63q-0.004$		
Hyper-MT	$\lambda(q)=0.61q-0.002$		

High MP cells			
	Lower powers	Intercept	Higher powers
Control	$\lambda(q)=0.68q-0.002$	2	$\lambda(q)=0.77q-0.2$ ^b
ATP dep	$\lambda(q)=0.52q-0.003$	1.5	$\lambda(q)=0.72q-0.2$ ^b
De-myosin	$\lambda(q)=0.69q-0.001$	2	$\lambda(q)=0.78q-0.2$
De-actin	$\lambda(q)=0.65q+0.001$	2	$\lambda(q)=0.72q-0.1$
Hyper-actin	$\lambda(q)=0.67q-0.001$	2	$\lambda(q)=0.82q-0.3$
De-MT	$\lambda(q)=0.79q-0.003$ ^c		
Hyper-MT	$\lambda(q)=0.74q-0.003$	2	$\lambda(q)=0.86q-0.2$

^a crossover does not indicate any of the 4 described cases, as basic motion is sub-diffusive

^b fit up to $q = 6$

^c fit up to $q = 7$