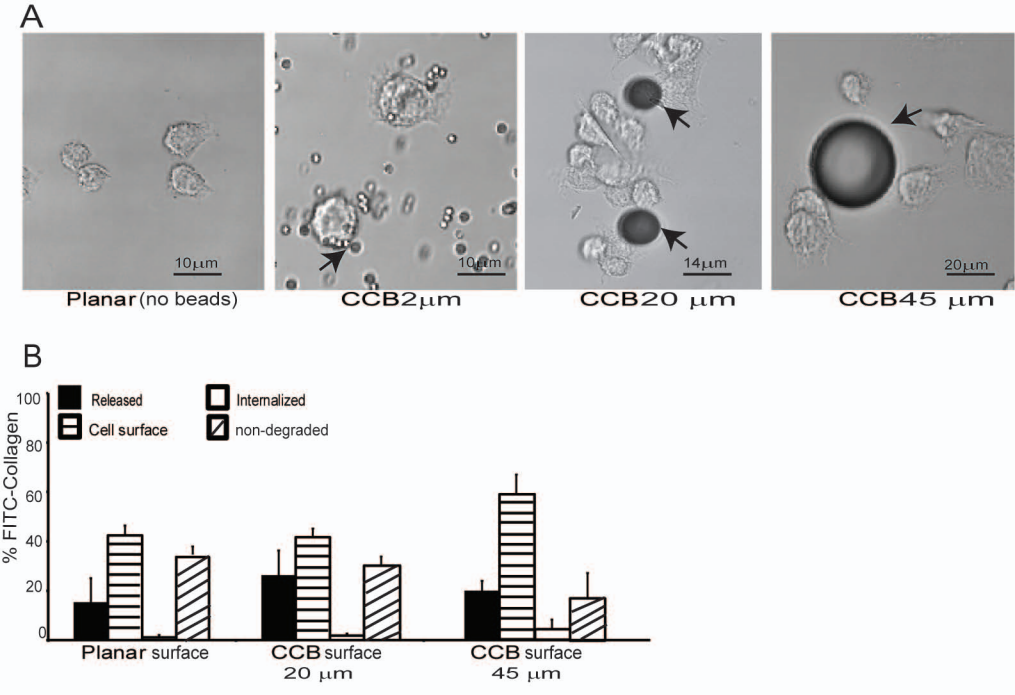
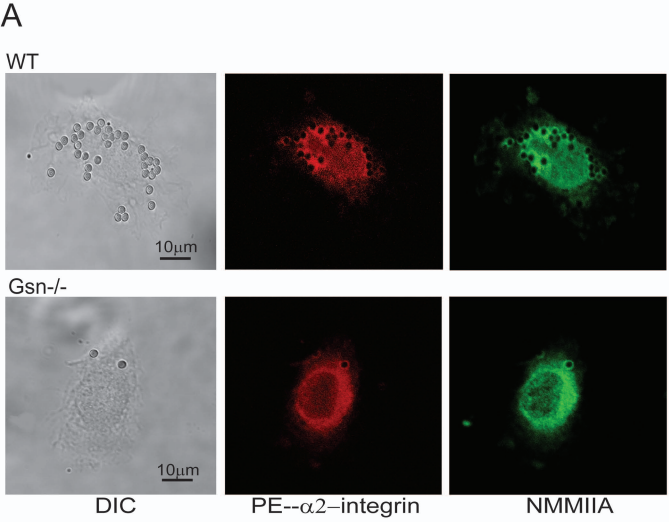
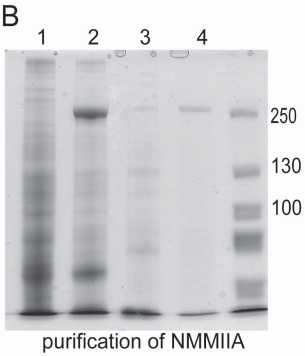
Supplementary Fig. 1A- Co-localization of NMMIIA with α2−integrin at collagen bead binding sites in gelsolin null and WT cells. **B-** Isolation of full-length NMMIIA from J744 macrophages. Lane 1 shows cell lysate, lane 2 is the crude actomyosin-enriched fraction, which was treated with MgATP to dissociate actin from myosin (lane 3). Lane 4 is the dialysed and concentrated NMMIIA sample. **C**- Myosin preparations immunoblotted for actin at different stages of purification. Middle lane is the crude preparation, left lane is the crude preparation treated with MgATP; right lane shows NMMIIA that has been treated with MgATP and this fraction shows no detectable actin contamination**. D**-Representative images obtained by electron microscopy of negatively-stained NMMIIA filaments diluted to 50 nM in buffer containing 150 mM KCl, 2 mM $MgCl_2$, 0.1 mM EGTA, 10 mM MOPS pH 7.0. **E-** Enhanced immunogold labeling of gelsolin on NMMIIA filaments compared with samples stained without primary antibody or NMMIIA filaments without gelsolin. **F -** Control experiment with GST alone shows no interaction with NMMIIA filaments. **G-** GST-Sepharose-bound gelsolin did not co-sediment with His-thioredoxin.

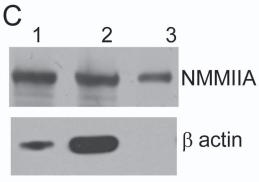
Supplementary Fig. 2A- Polymerization curves of G-actin (pyrene-labeled, 2 μM actin) after addition of 0.05 μM gelsolin or with varying concentrations of NMMIIA (0.025 μM, 0.1 μM, 0.2 μM or 0.4 μM) incubated with gelsolin (0.05 μM). The fluorescence signal due to Cys-374-bound pyrene is not altered by addition of the NMMIIA-gelsolin complex. **B-** NMMIIA alone had no effect on polymerization. **C**- End-point polymerization (overnight) due to capping of pyrene-labeled actin with 0.05 μM gelsolin or with various concentrations of NMMIIA (0.025 μM, 0.05 μM, 0.1 μM, or 0.2 μM, 0.4μM) and gelsolin (0.05 μM). **D-** NMMIIA alone had no effect on capping of pyrene-labeled actin.

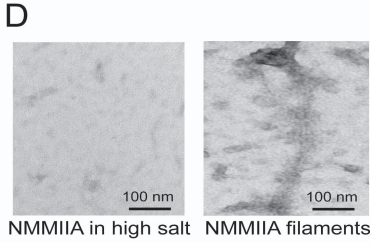
Supplementary Fig. 3 -A- Phase contrast images of cells plated on collagen-coated planar surfaces or on 2 μm, 20 μm and 45 μM collagen-coated beads. **B-** Cells plated on collagen-coated beads of 20 μm or 45 μm diameter showed minimal collagen internalization. **C**- Gelsolin null or WT cells were plated on biotinylated collagen for 2 or 8 hours, trypsinized from plates and lysed. Cell lysates were separated by SDS-PAGE, transferred to membranes and the intracellular biotinylated collagen was probed with streptavidin peroxidase. The blots show more extensive collagen proteolysis after 2 and 8 hours in cells expressing gelsolin compared with gelsolin null cells. **D**-Treatment with blebbistatin (50 μM) did not prevent targeting of NMMIIA and gelsolin to collagen bead sites.

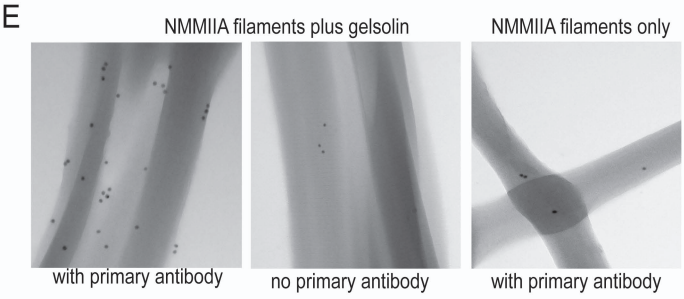

A
10μm
Planar (no beads)
10μm
CCB2μm
14μm
CCB20 μm
20μm
CCB45 μm
B
Released
Cell surface
Internalized
non-degraded
% FITC-Collagen
100
80
60
40
20
0
Planar surface
CCB surface
20 μm
CCB surface
45 μm
C
2 hrs
WT
Gsn-/-
8 hrs
WT
Gsn-/-
D
Blebbistatin
10μm
DIC
NMMIA
gelsolin

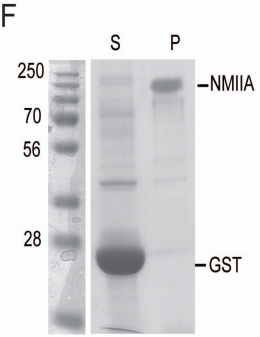

A
WT
10μm
Gsn-/-
10μm
DIC
PE--α2–integrin
NMMIIA

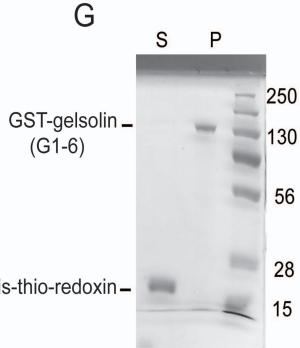

B
1
2
3
4
250
130
100
purification of NMMIIA

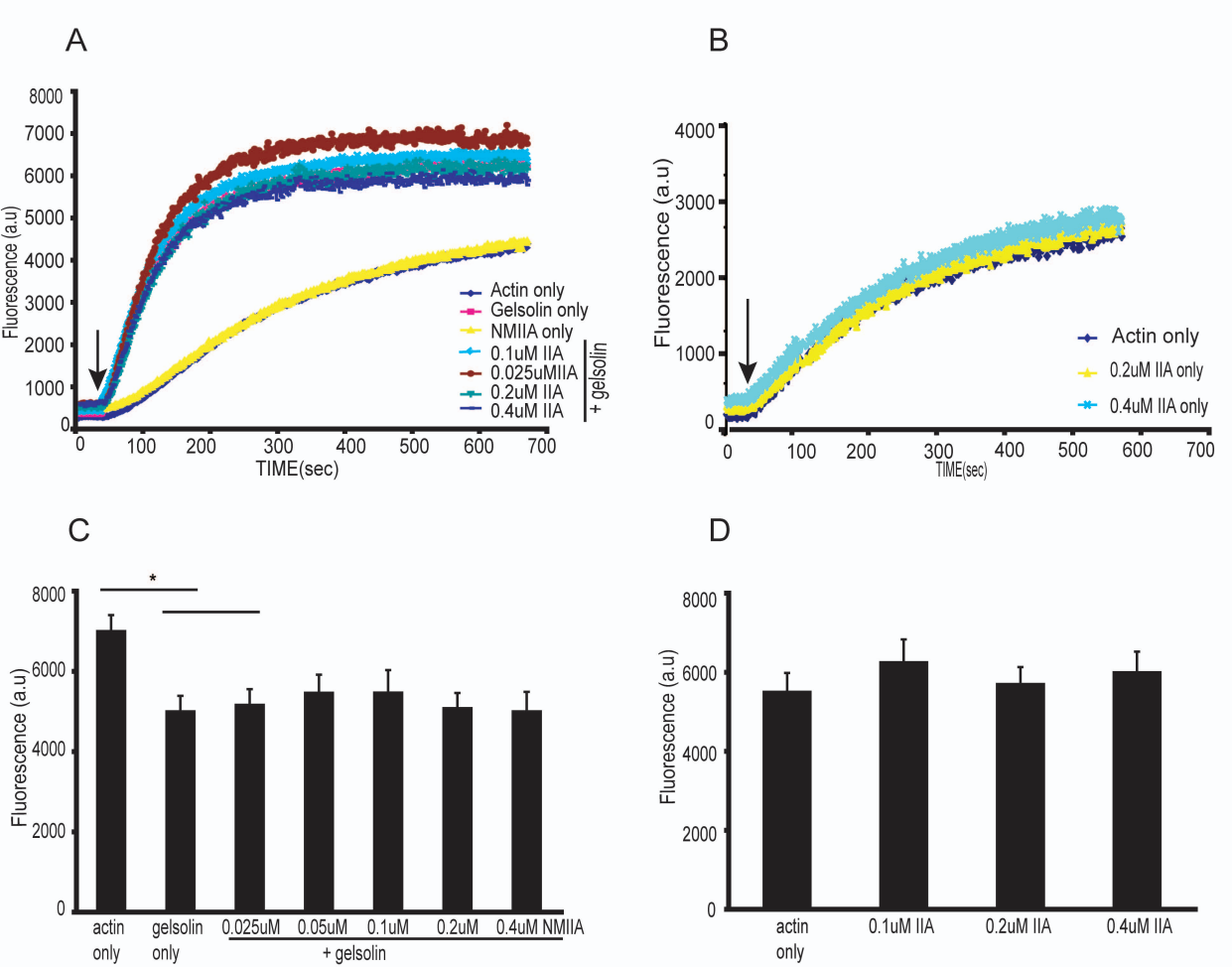

C
1
2
3
NMMIIA
β actin


D
100 nm
100 nm
NMMIIA in high salt
NMMIIA filaments


E
NMMIIA filaments plus gelsolin
NMMIIA filaments only
with primary antibody
no primary antibody
with primary antibody


F
S
P
250
70
56
28
NMMIIA
GST


G
S
P
GST-gelsolin
(G1-6)
His-thio-redoxin
250
130
56
28
15


A
Fluorescence (a.u)
TIME(sec)
Actin only
Gelsolin only
NMIIA only
0.1uM IIA
0.025uMIIA
0.2uM IIA
0.4uM IIA
+ gelsolin
B
Fluorescence (a.u)
TIME(sec)
Actin only
0.2uM IIA only
0.4uM IIA only
C
Fluorescence (a.u)
*
actin only
gelsolin only
0.025uM
0.05uM
0.1uM
0.2uM
0.4uM NMIIA
+ gelsolin
D
Fluorescence (a.u)
actin only
0.1uM IIA
0.2uM IIA
0.4uM IIA