SUPPLEMENTAL DATA

Legends to Supplemental Movies and Figures

Supplemental Movies. Representative streaming movies (200 msec exposures) of CLIP-170 fragments, acquired as described by Folker *et al.* (1).

Supplemental Movie 1. GFP-CLIP-170 $H1^{1-350}$—As previously reported, the complete CLIP-170 $H1^{1-350}$ head domain highlights the growing plus-ends of microtubules (MTs) with bright, robust comets.

Supplemental Movie 2. GFP-CLIP-170 $H1^{58-300}$**—**Removing the first and third serine-rich regions does not abolish the plus-end tracking activity, although the comets are slightly less bright and robust when compared to $H1^{1-350}$.

Supplemental Movie 3. GFP-CLIP-170 $H1^{203-350}$—While not nearly as bright or robust as $H1^{1-350}$, the distal portion of CLIP-170 consisting of CAP-Gly-2 domain and third serine-rich region of $H1^{203-350}$ clearly has MT plus-end tracking ability.

Supplemental Figure 1. Fluorescence microscopy visualization of the dynamic polymer morphology formed in the presence of stabilized MT seeds, tubulin (5.0 μM**)** and CLIP-170 fragments. Samples were prepared as described in Fig. 3*D-F* with some modifications. Briefly, bovine brain tubulin dimly labeled with TAMRA (Invitrogen) was incubated with brightly labeled seeds and either unlabeled $H1^{1-350}$ **(**120 nM) or unlabeled other fragments (240 nM) for 15-20 min at 37 °C and then samples were visualized (200 msec exposures) by fluorescence microscopy. **(A)** The control sample in the absence of CLIP-170 fragments; **(B)** $H1^{1-350}$; **(C)** $H1^{1-155}$; **(D)** $H1^{156-350}$. Images shown are representative.

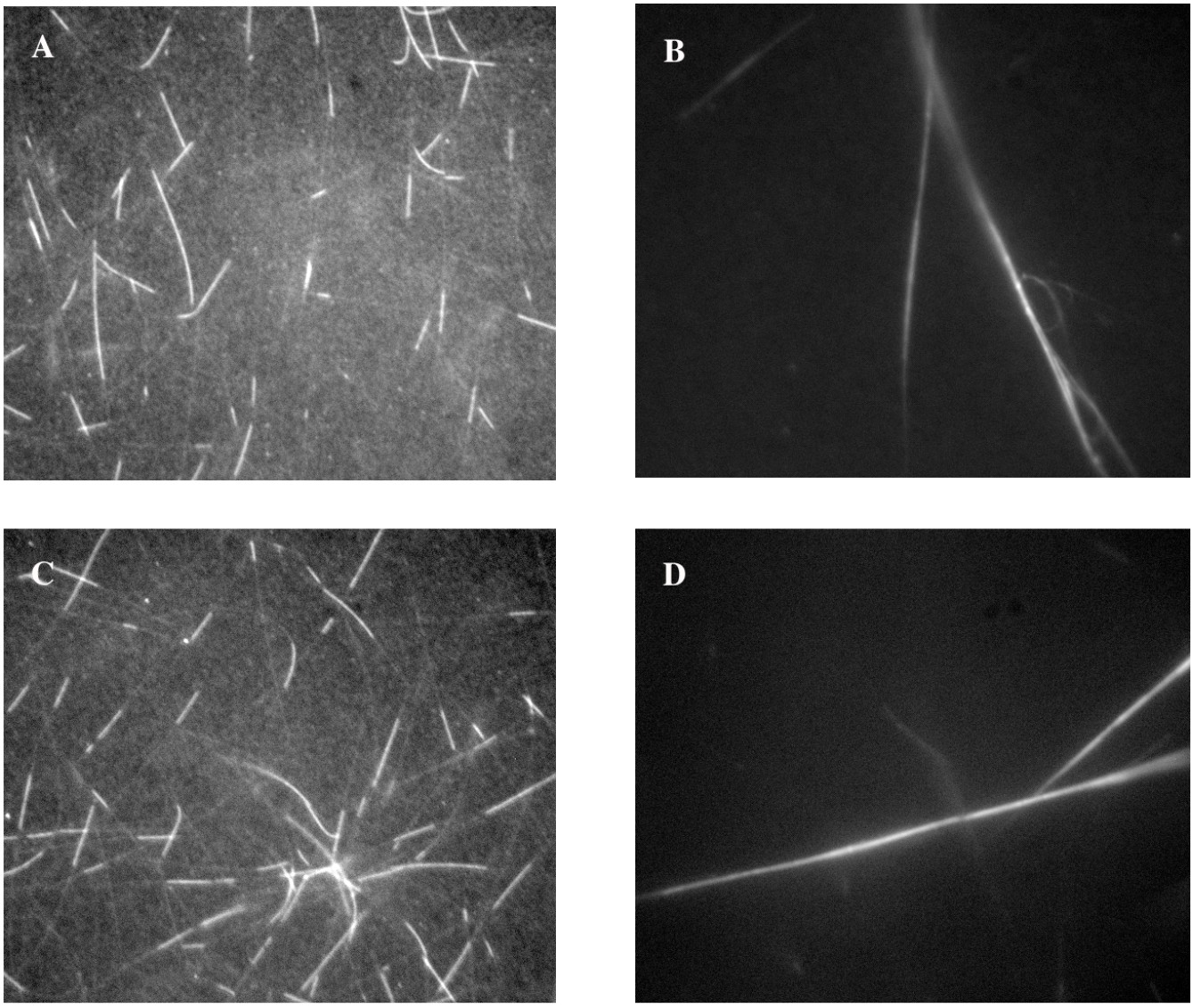
Supplemental Figure 2. Fluorescence microscopic analysis of the glutaraldehyde fixed MT polymers formed in the absence of exogenous MT seeds. **(A)** Tubulin alone (12 μM); **(B)** $H1^{1-350}$; **(C)** $H1^{58-211}$; **(D)** $H1^{58-300}$; **(E)** $H1^{122-300}$; **(F)** $H1^{203-350}$. Images shown are representative.

Methods used for Supplemental Figure 1. Tubulin was prepared by the high-molarity buffer approach of Castoldi and Popov (2). Images were captured with a 100x 1.3NA objective on a Zeiss Axioplan 2 microscope and a Photometrics CoolSNAP camera. Images were optimized for visualization of the MTs by Adobe Photoshop.

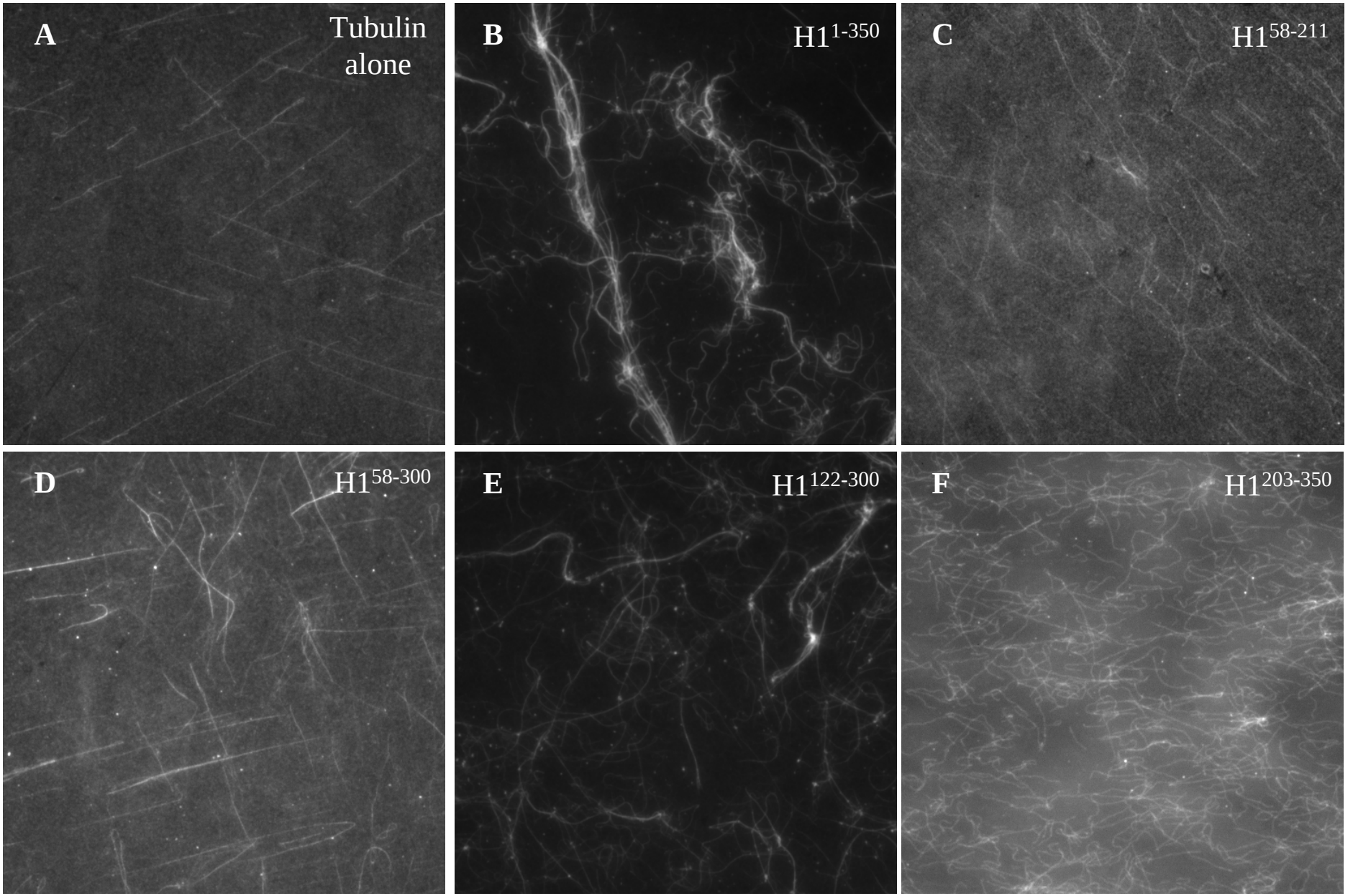
Methods used for Supplemental Figure 2. Samples were prepared, fixed, and diluted as described in Fig. 3*A-C*, the only modification being that 10% of the tubulin was labeled with TAMRA. They were then mounted for microscopy by compressing 2 μL of the diluted sample between a slide and a 22mm coverslip so that the entire sample was visible in one plane. Images were captured (150 msec exposures) on a TE2000 Nikon inverted microscope with a Cascade 512 B camera and processed for visualization by Adobe Photoshop.

REFERENCES

1. Folker, E. S., Baker, B. M., and Goodson, H. V. (2005) *Mol. Biol. Cell* **16**, 5373-5384
2. Castoldi, M., and Popov, A. V. (2003) *Protein Expr. Purif.* **32**, 83-88.



Supplemental Figure 1.



Supplemental Figure 2.