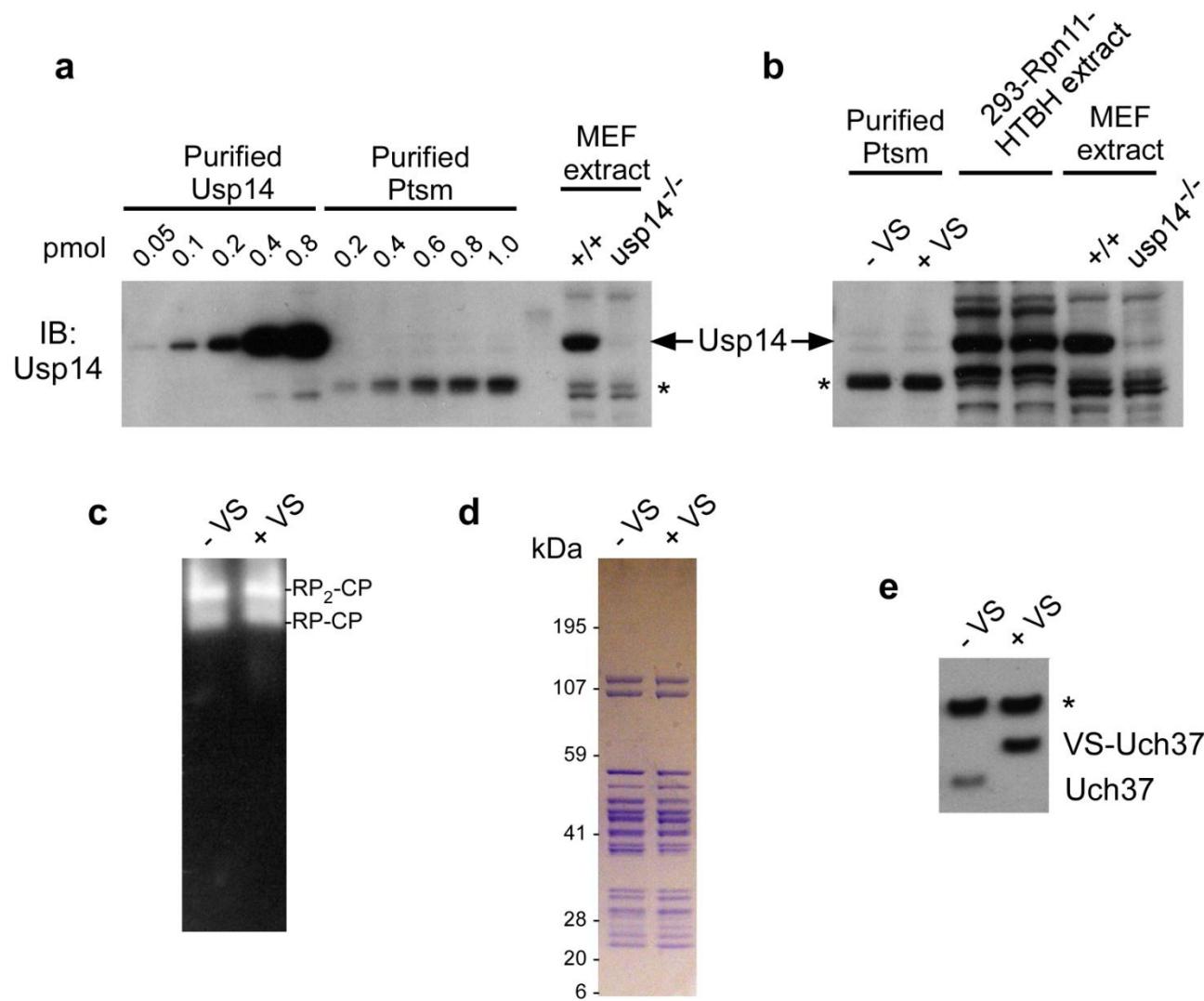
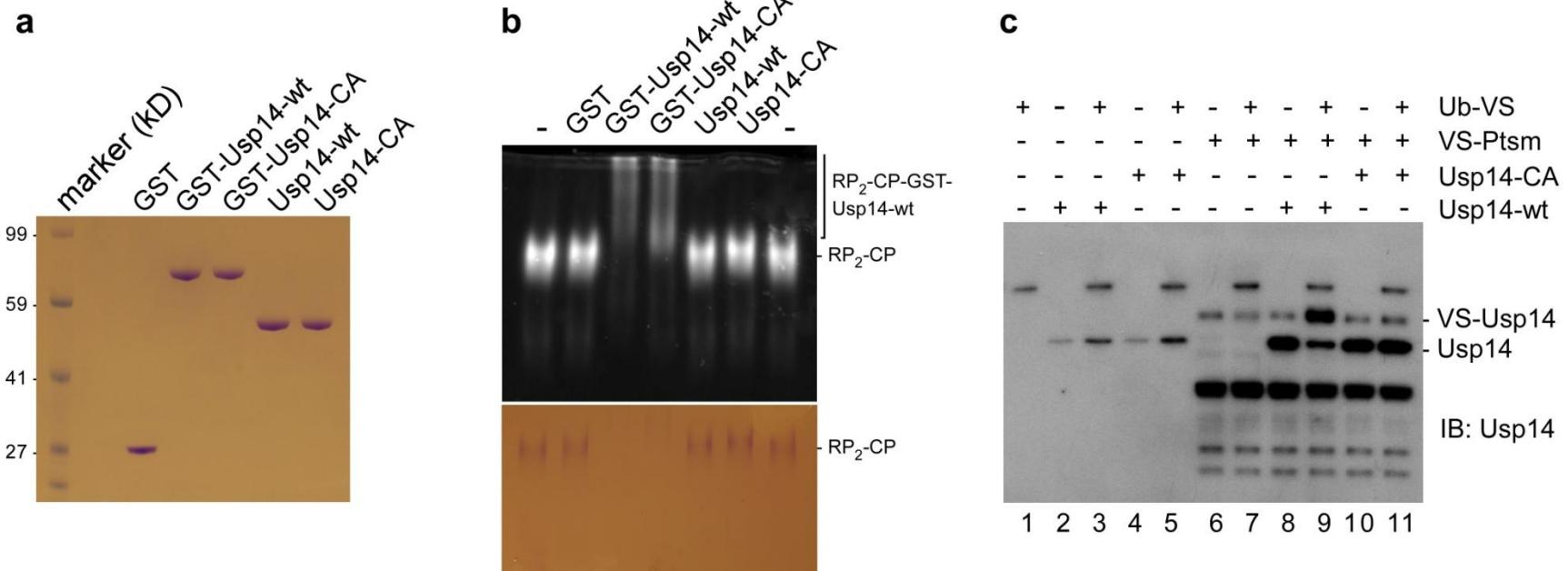


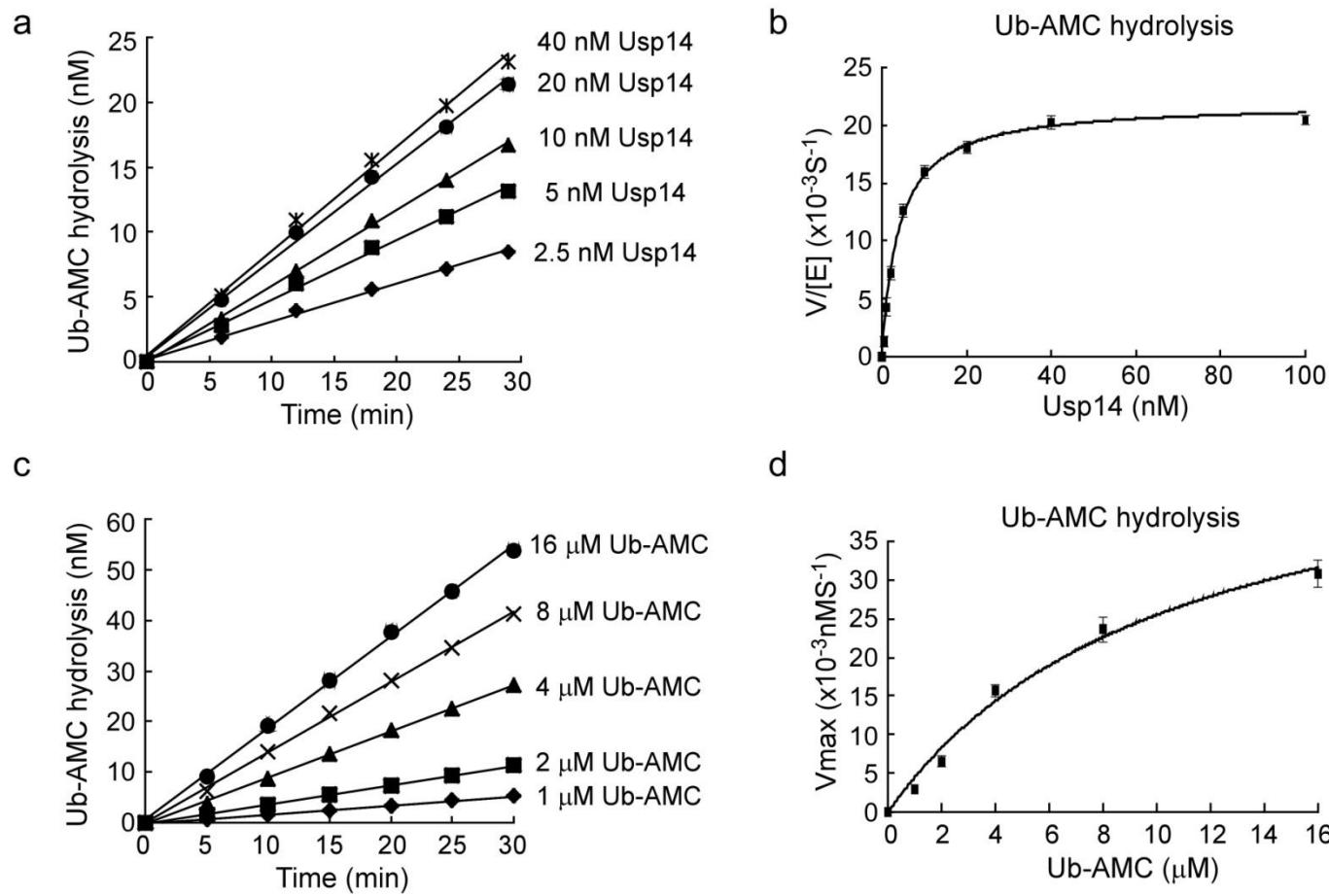
Supplementary Fig. 1



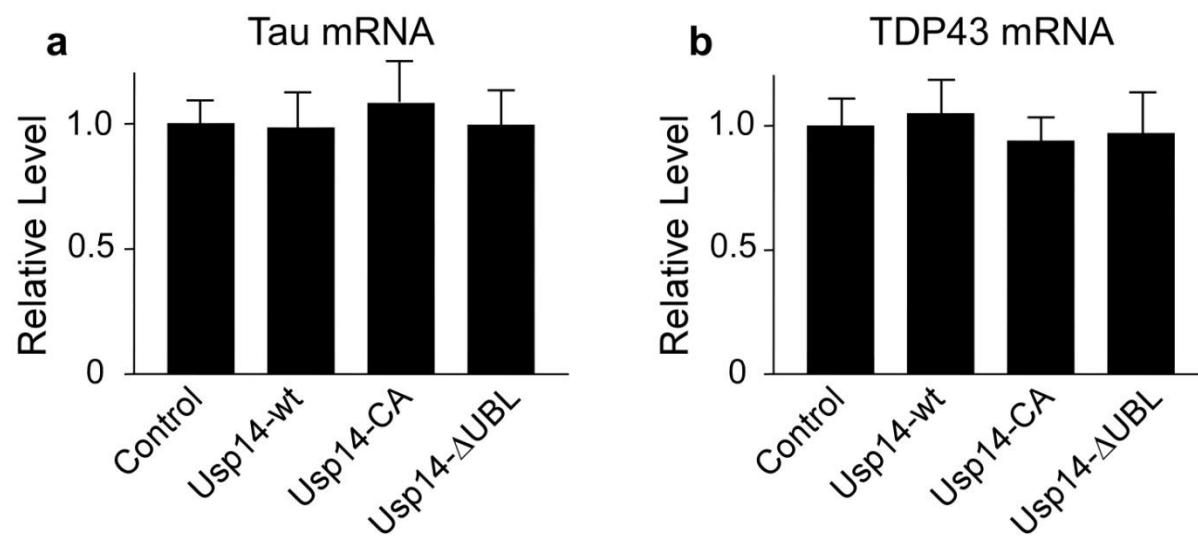
Supplementary Fig. 2



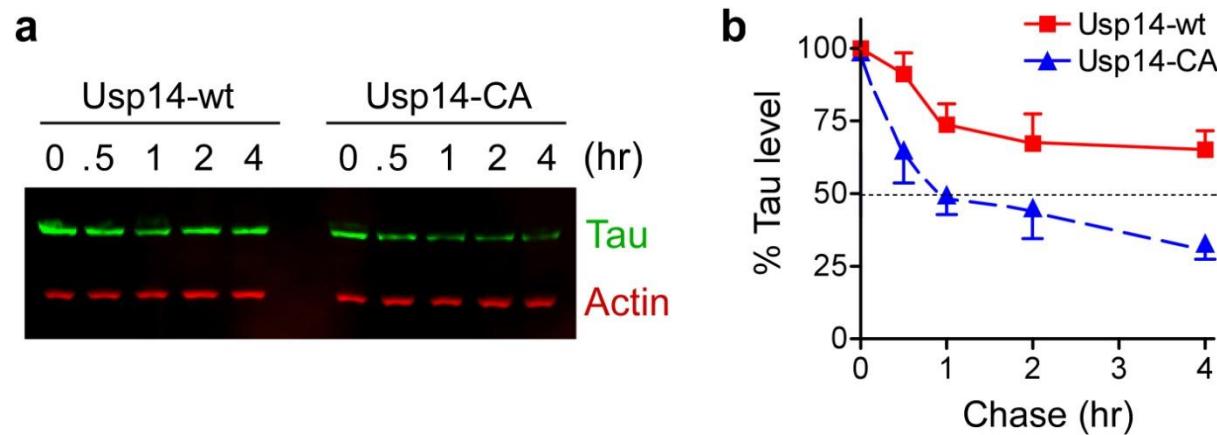
Supplementary Fig. 3



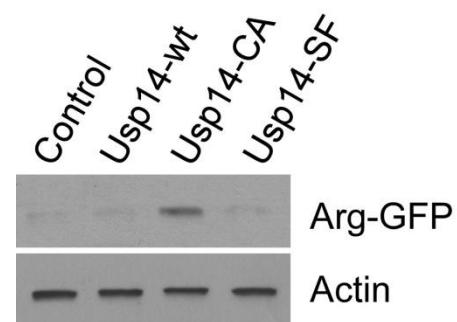
Supplementary Fig. 4



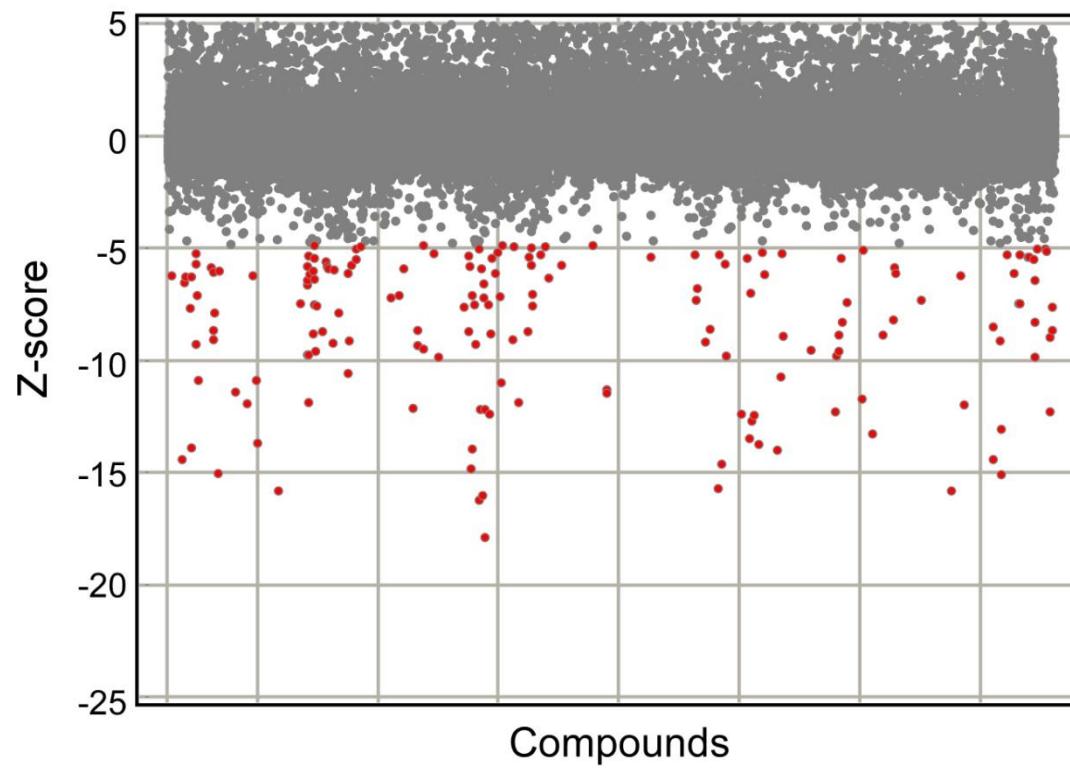
Supplementary Fig. 5



Supplementary Fig. 6

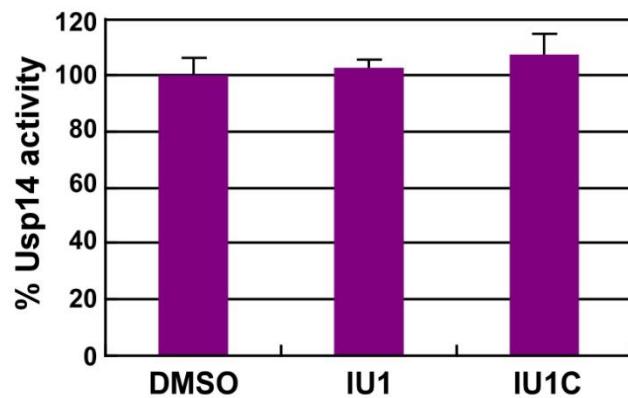


Supplementary Fig. 7

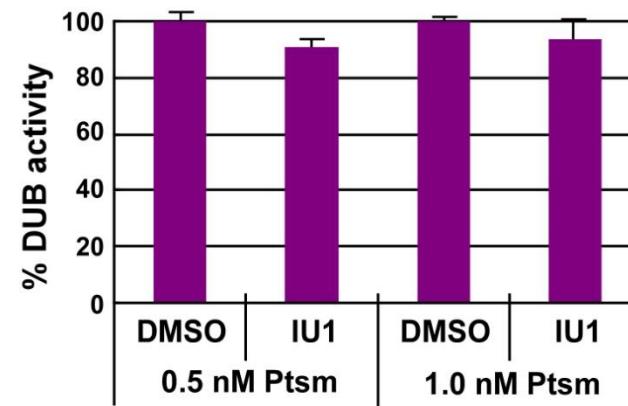


Supplementary Fig. 8

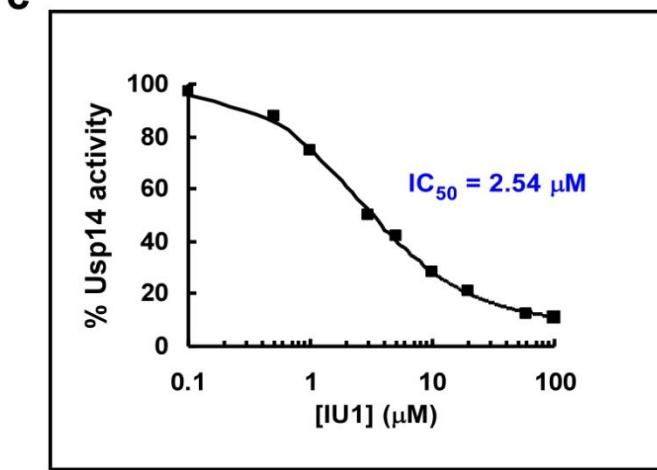
a



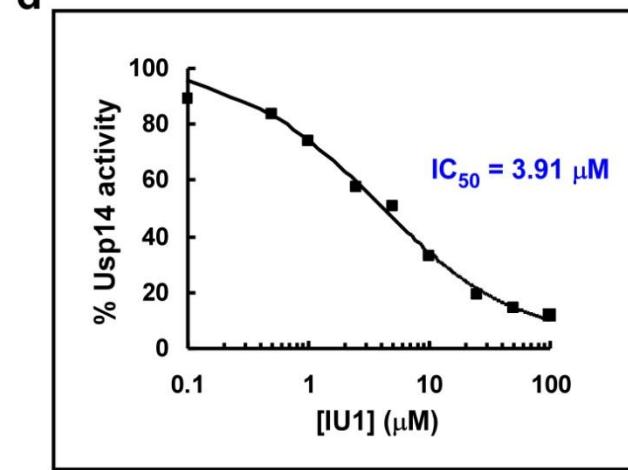
b



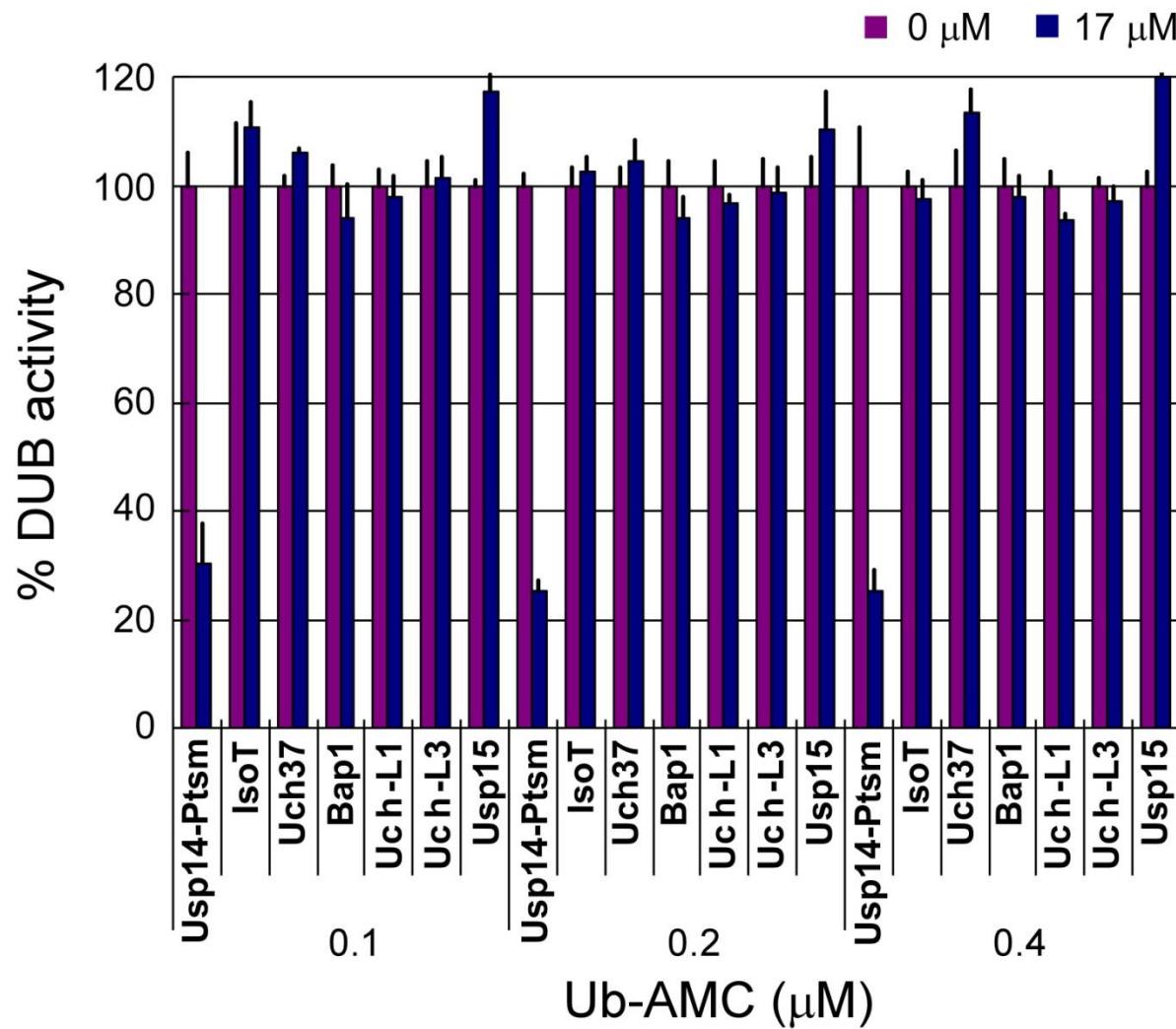
c



d



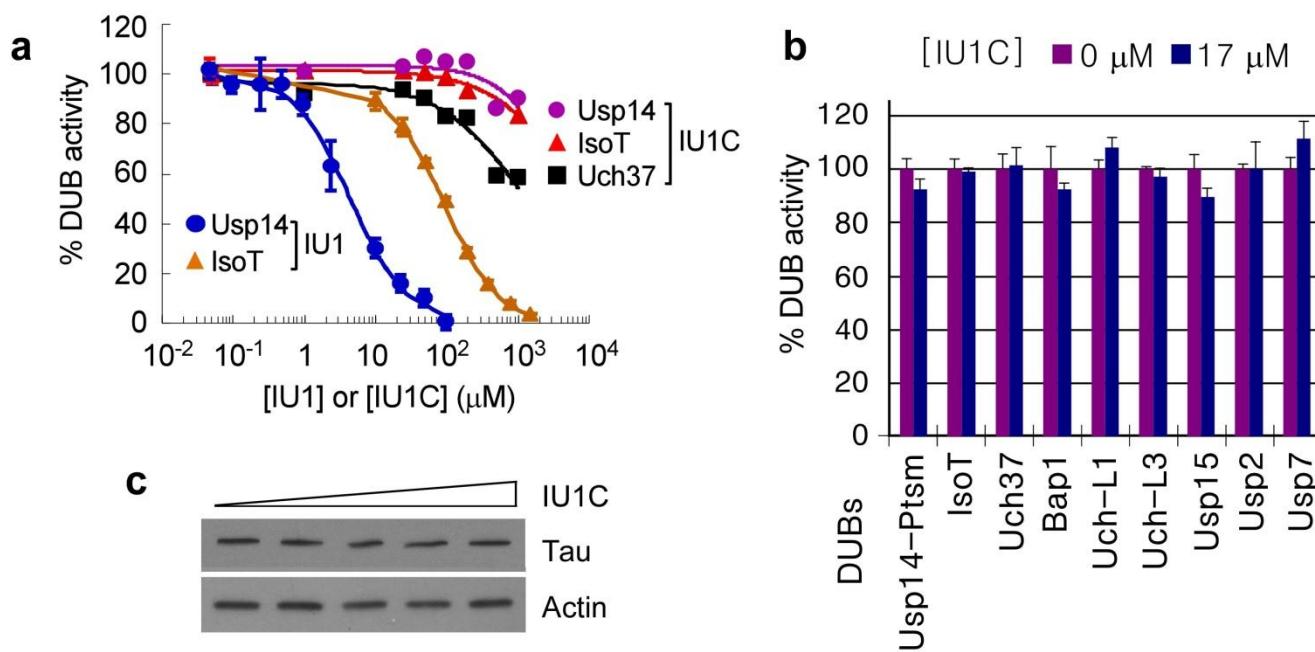
Supplementary Fig. 9



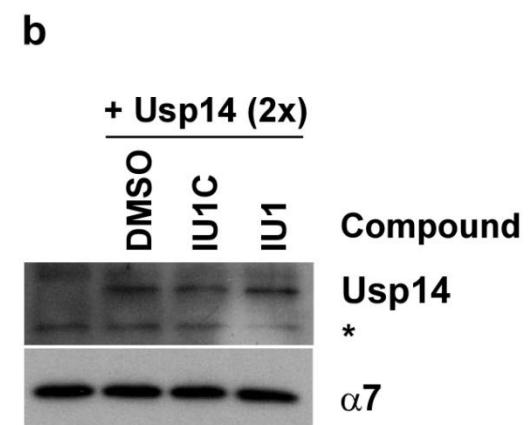
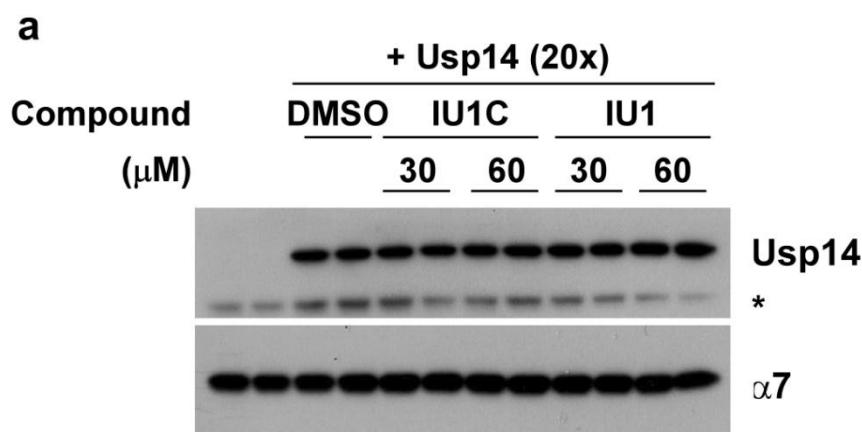
Supplementary Fig.10

Enzyme	K_M (μM)	Substrates	References for K_M
Usp14-26S	11	Ub-AMC	This study
Bap1	7	Ub-AMC	Personal communication, K. Wilkinson
IsoT	1.4	Ub-AMC	Dang et al (1998) Biochemistry, 37: 1868
Uch37	12.7	Ub-AMC	Yao et al (2006) Nat Cell Biol, 8: 994
Uch-L1	0.041	Ub-AMC	Liu et al (2003) Chem Biol, 10: 837
Uch-L3	0.039	Ub-AMC	Dang et al (1998) Biochemistry, 37: 1868
Usp2 CD	0.554	Ub-AMC	Hassiepen et al (2007) Anal Biochem, 371: 201
Usp7 CD	44.2	Ub-AMC	Fernandez-Montalvan et al (2007) FEBS J, 274: 4256
Usp15	2.98	Ub-AMC	This study

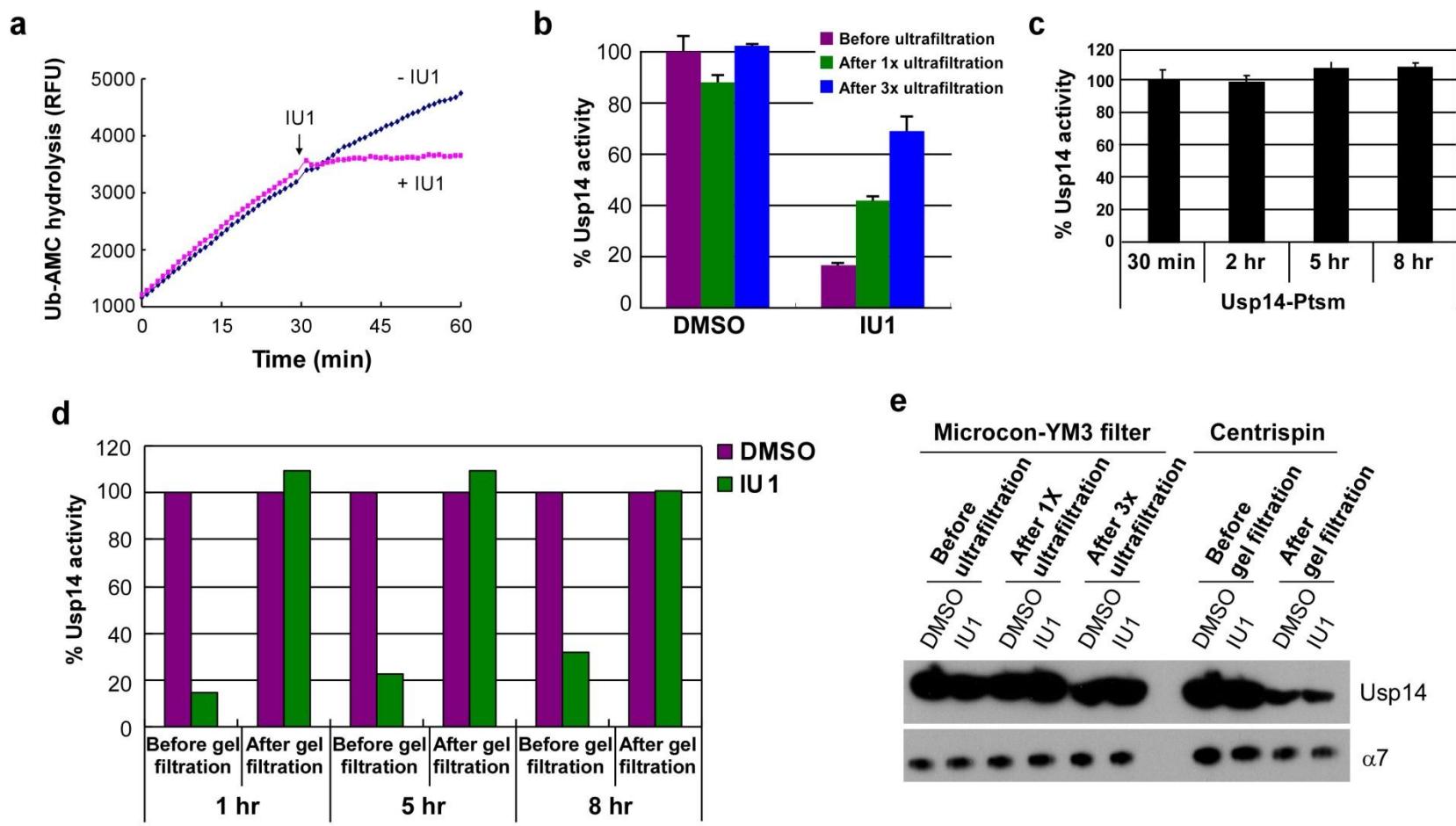
Supplementary Fig. 11



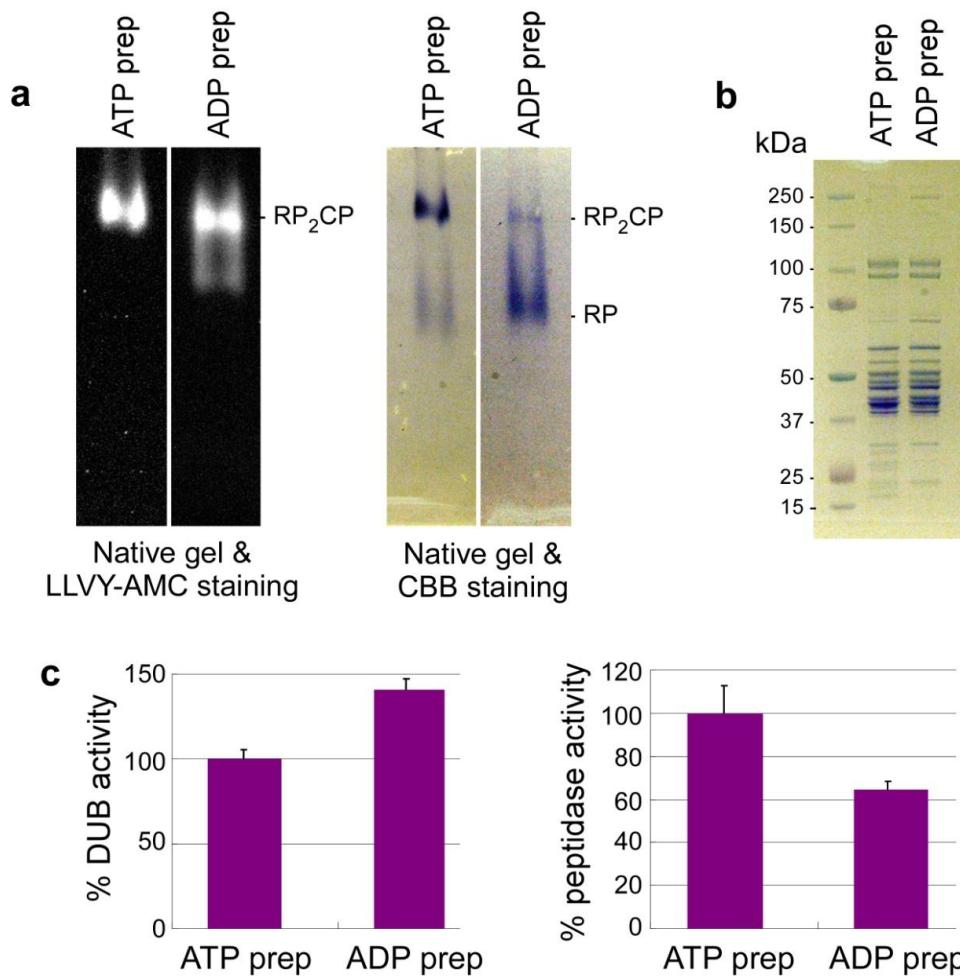
Supplementary Fig. 12



Supplementary Fig. 13

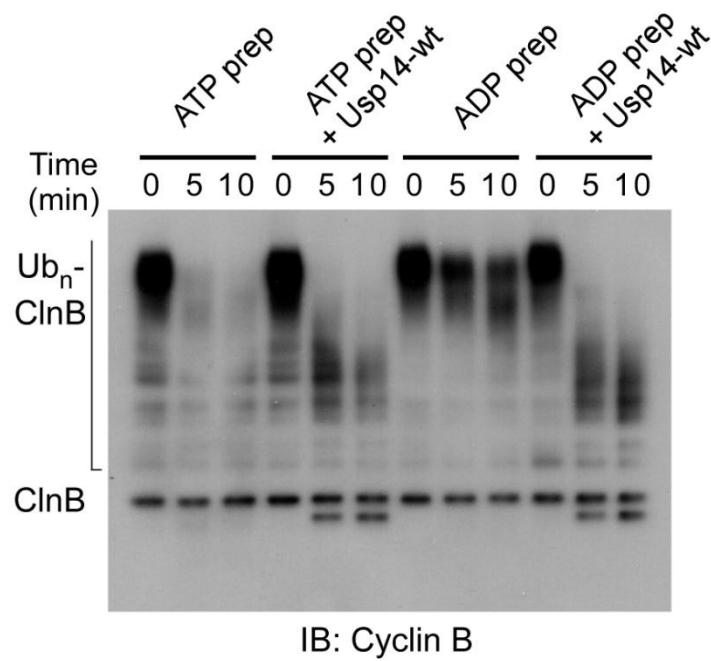


Supplementary Fig. 14a -14c

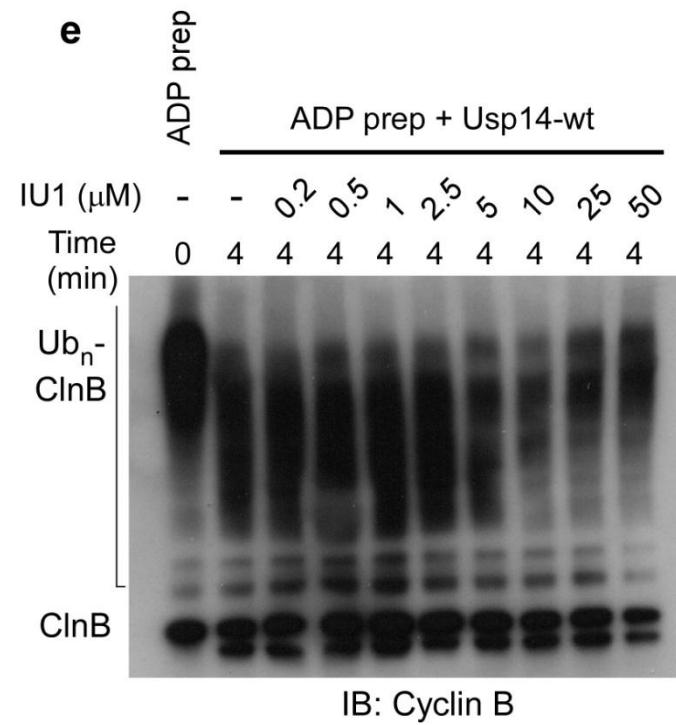


Supplementary Fig. 14d & 14e

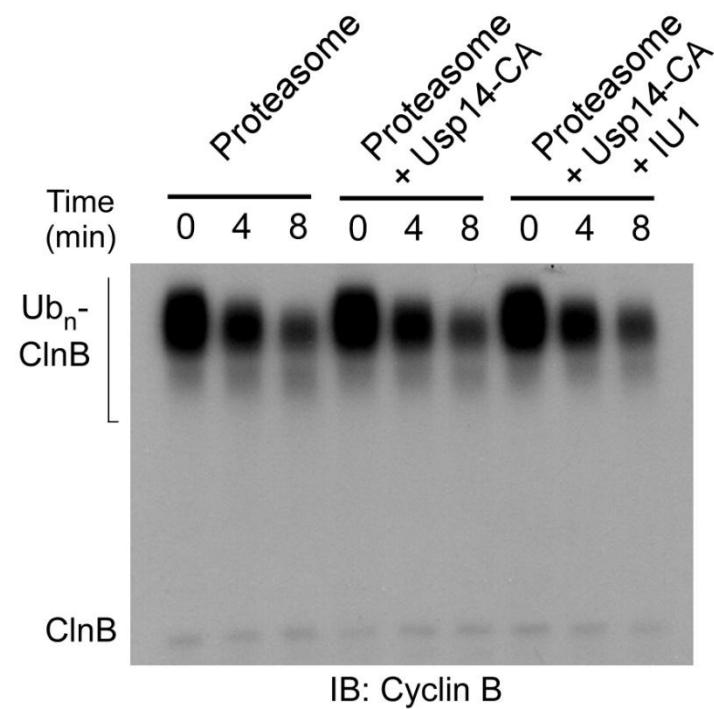
d

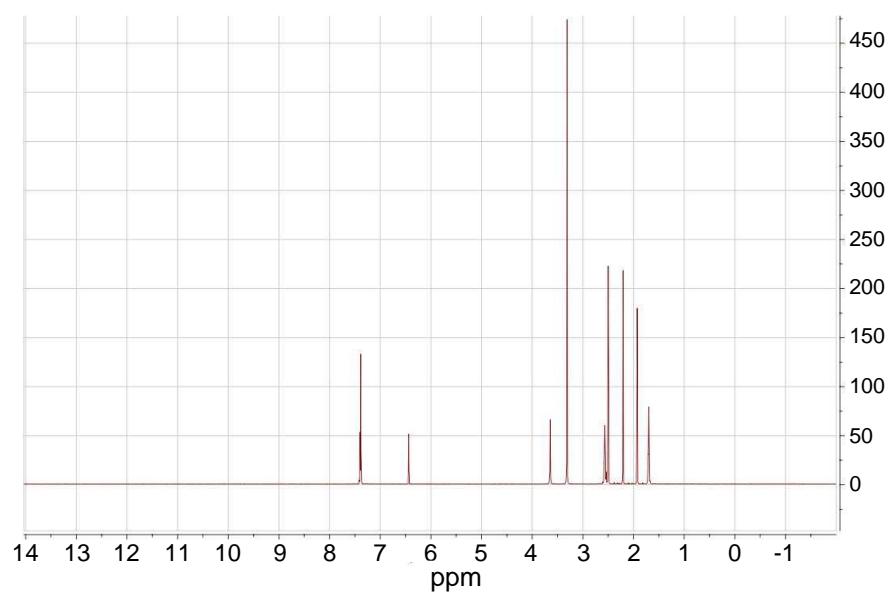
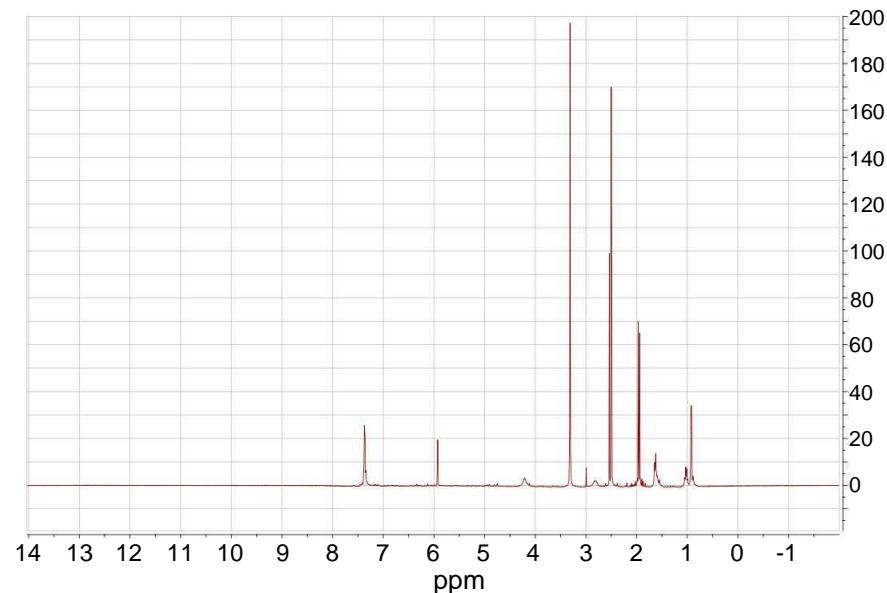
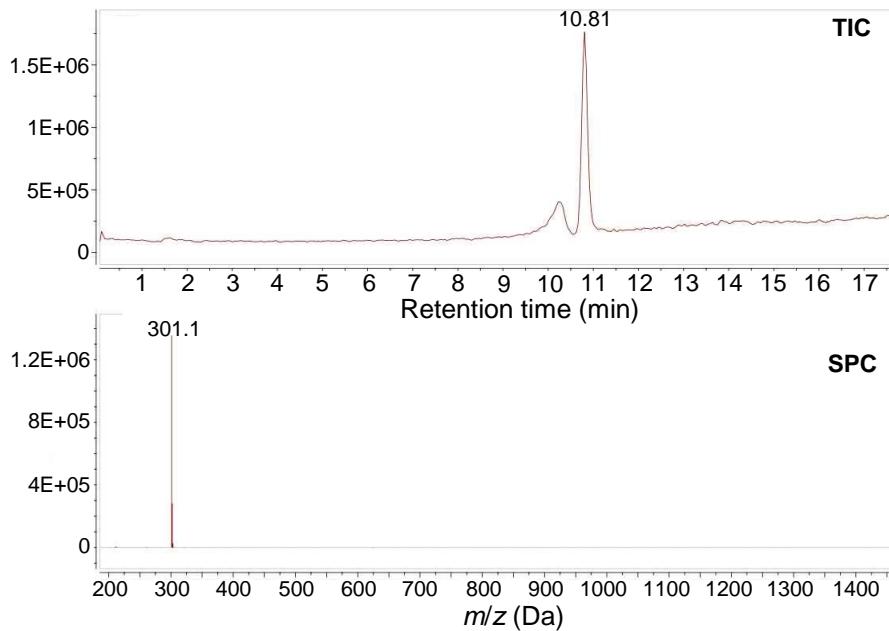
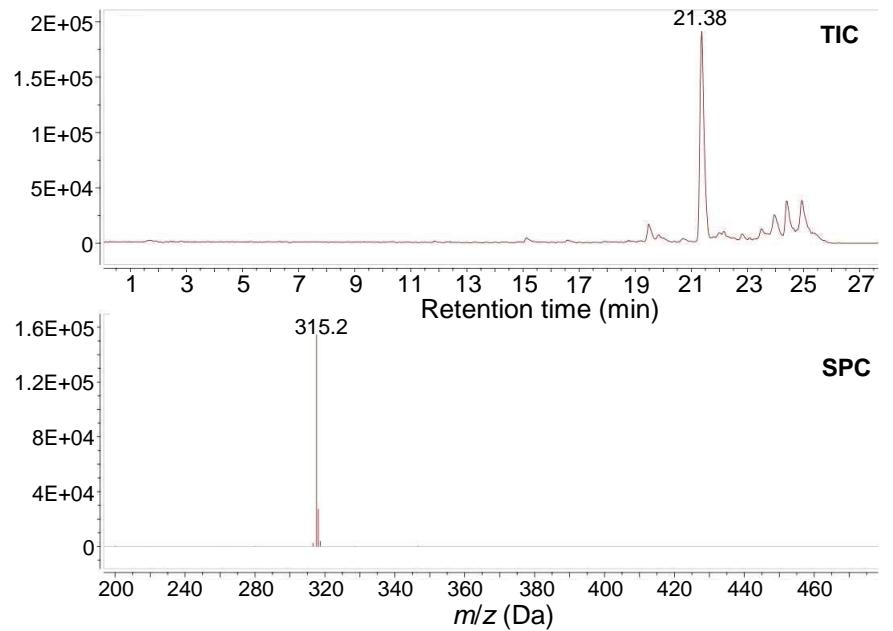


e

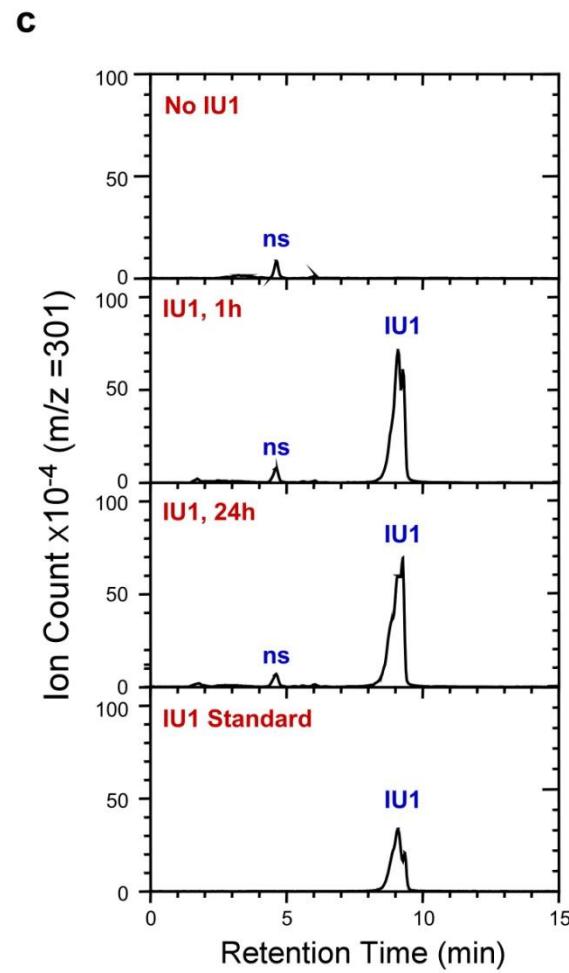
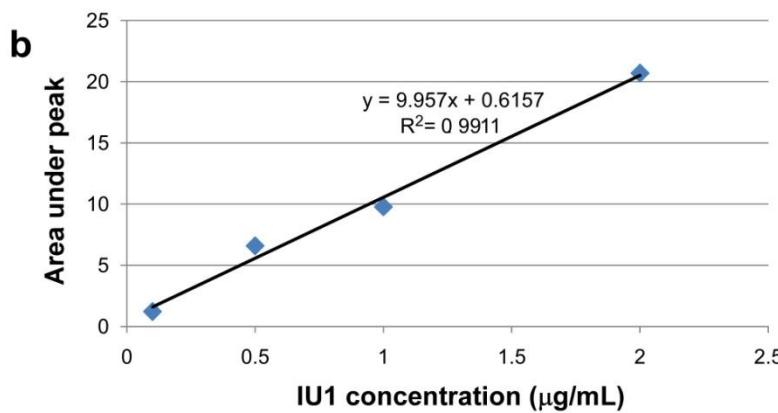
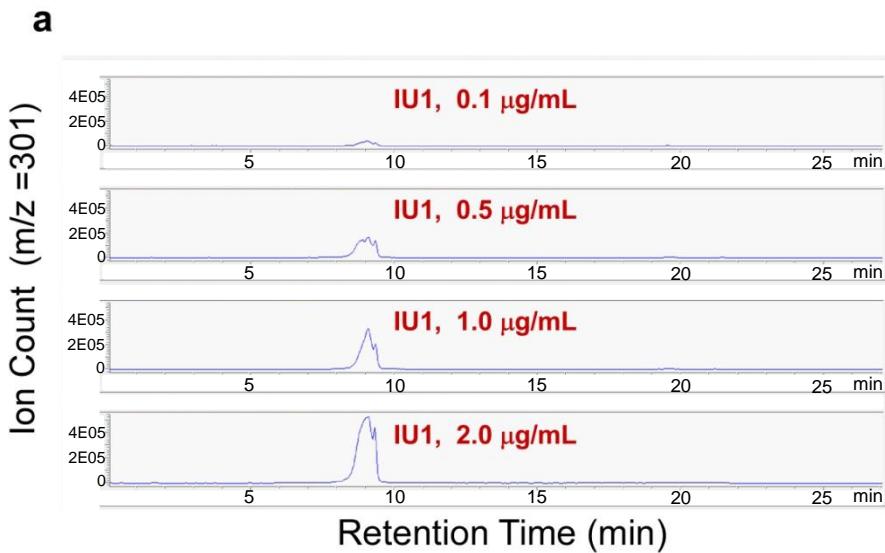


Supplementary Fig. 15



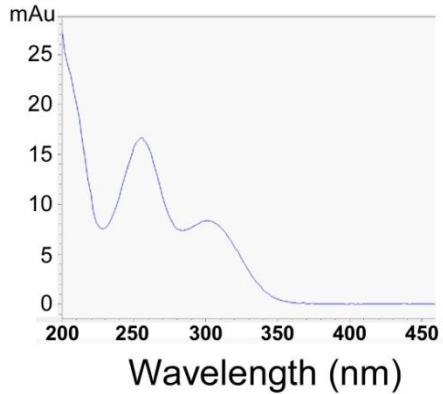
Supplementary Fig. 16**a****b****c****d**

Supplementary Fig. 17

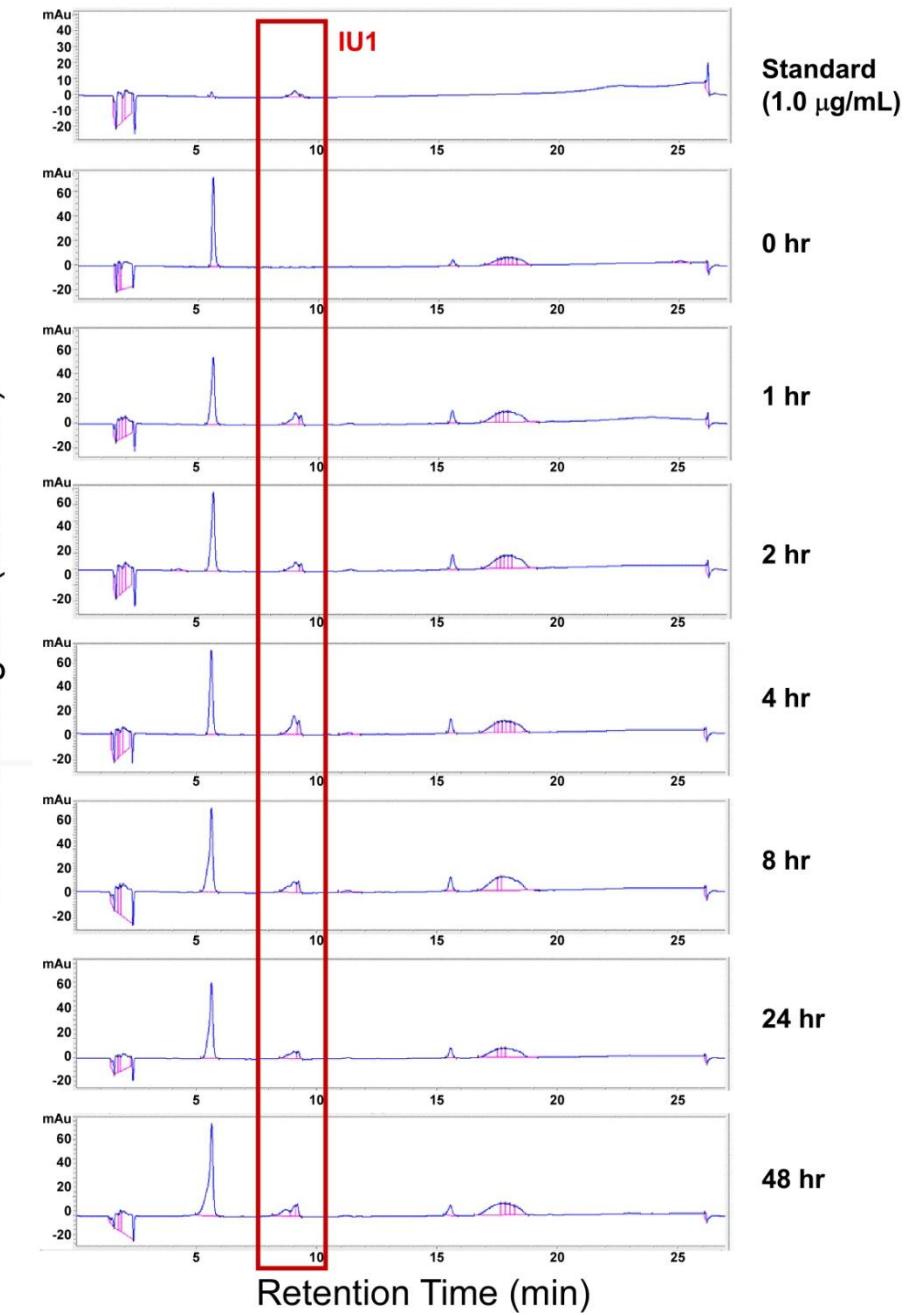


Supplementary Fig. 18

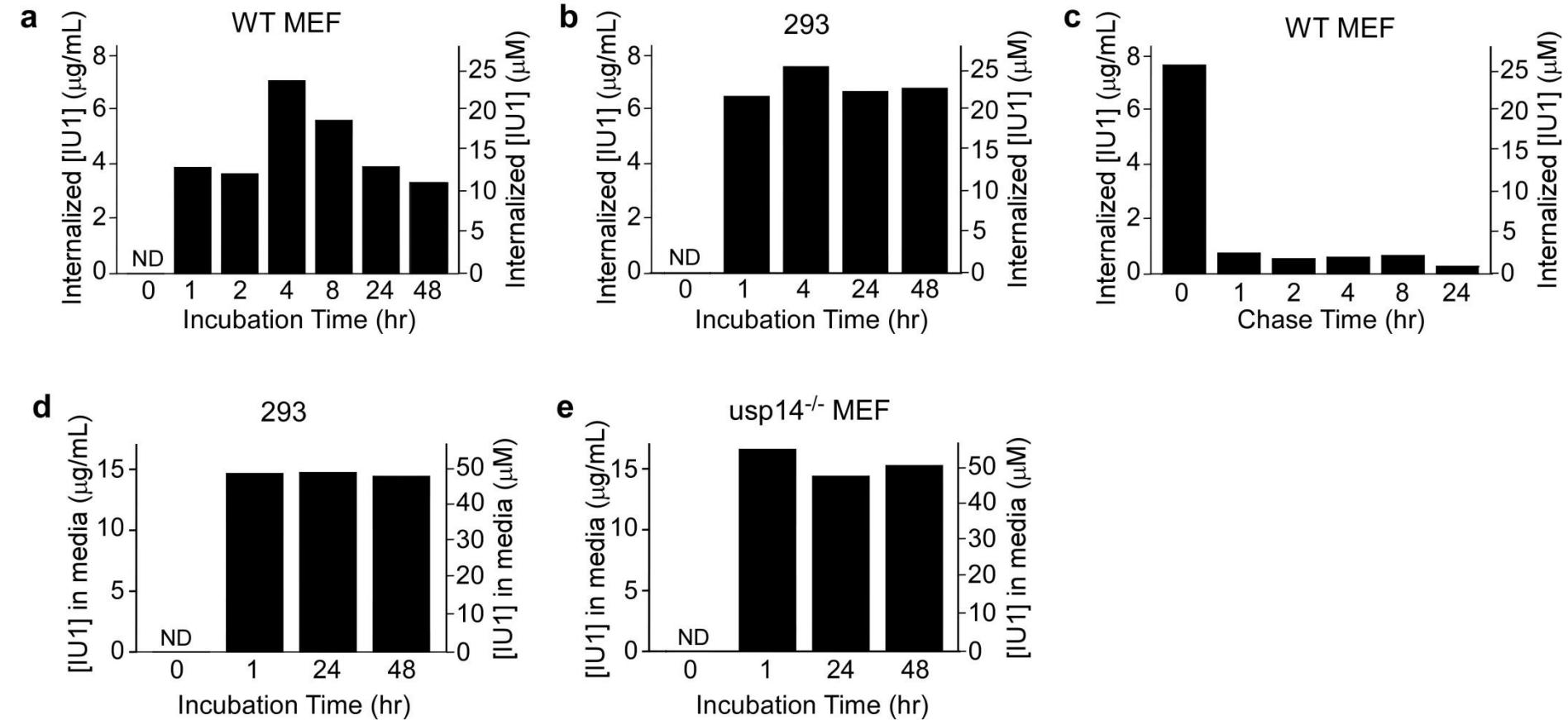
a



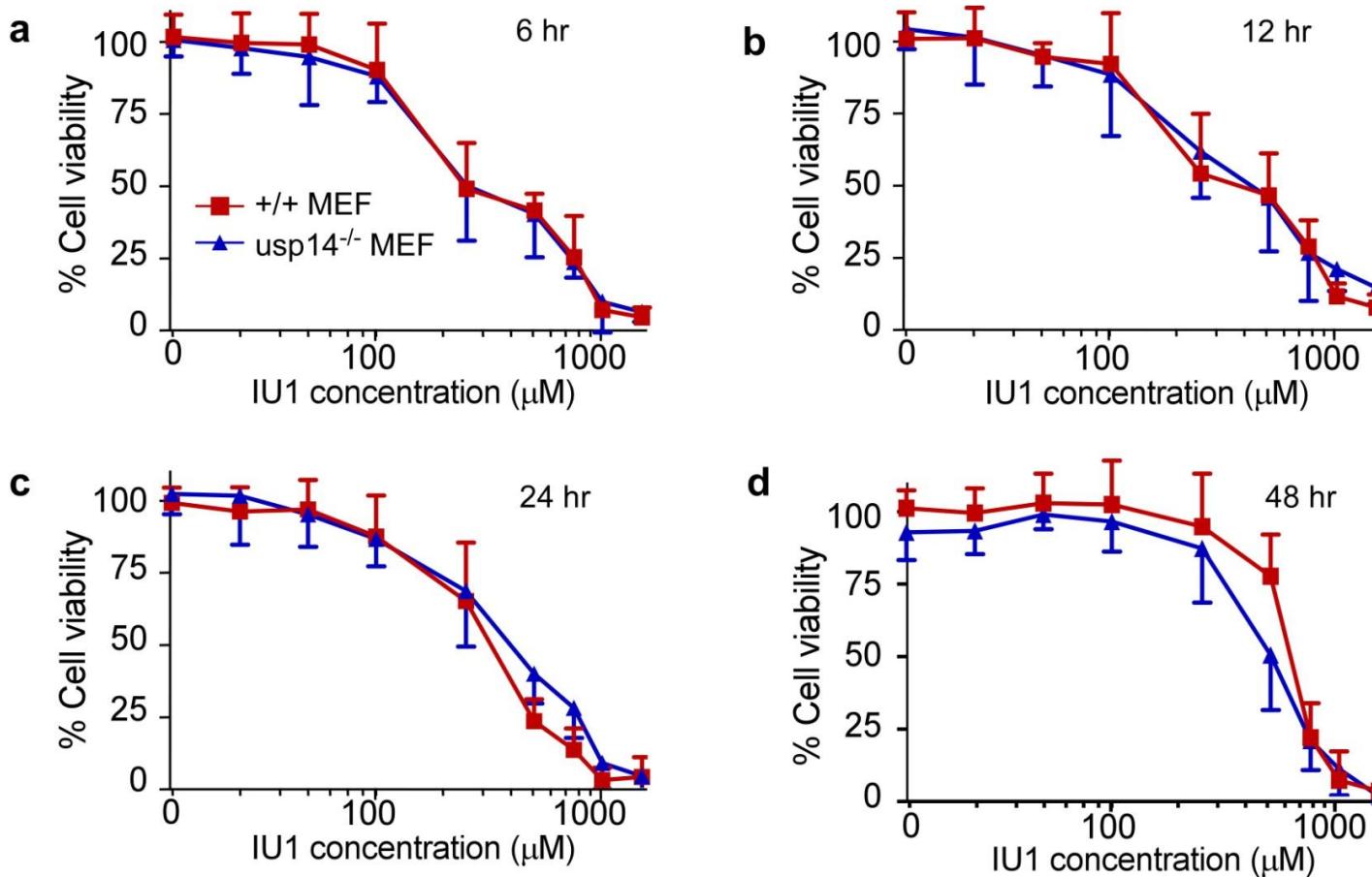
b



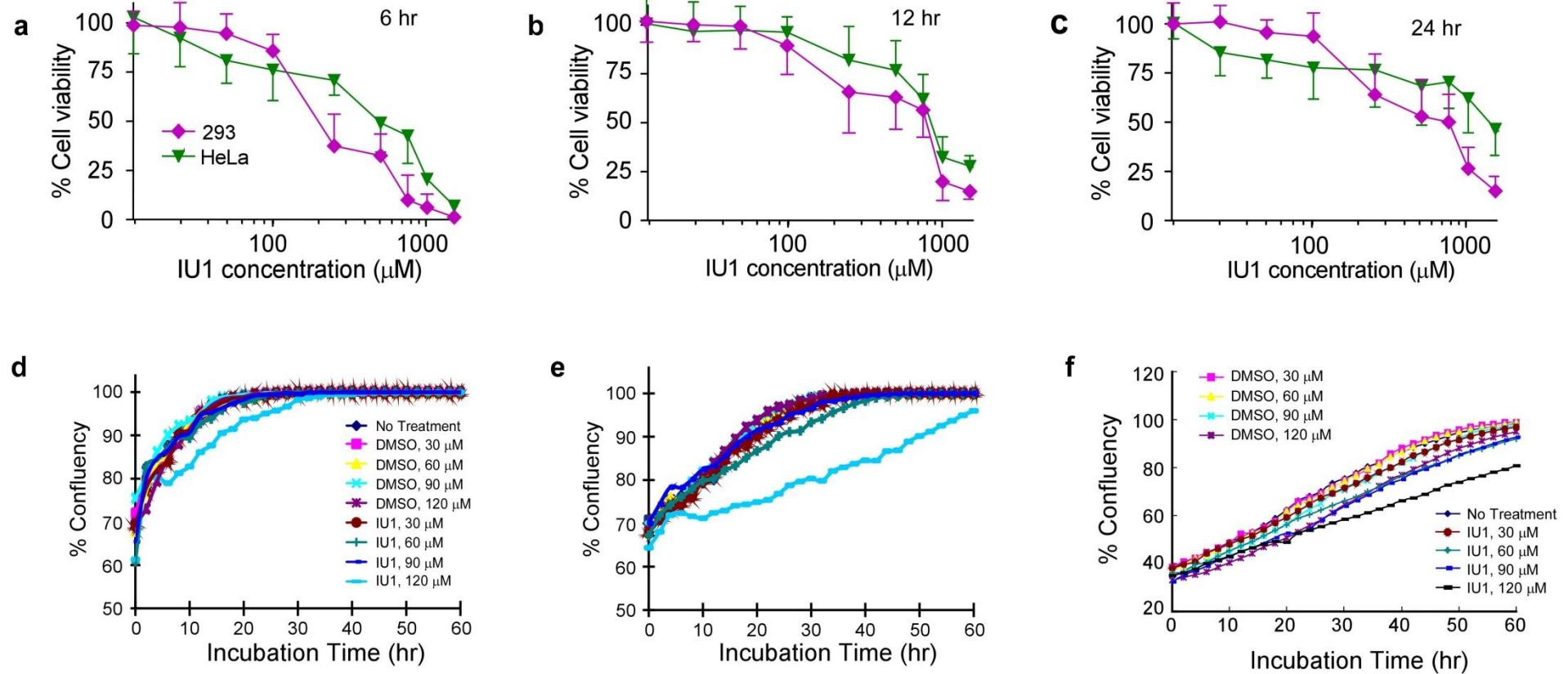
Supplementary Fig. 19



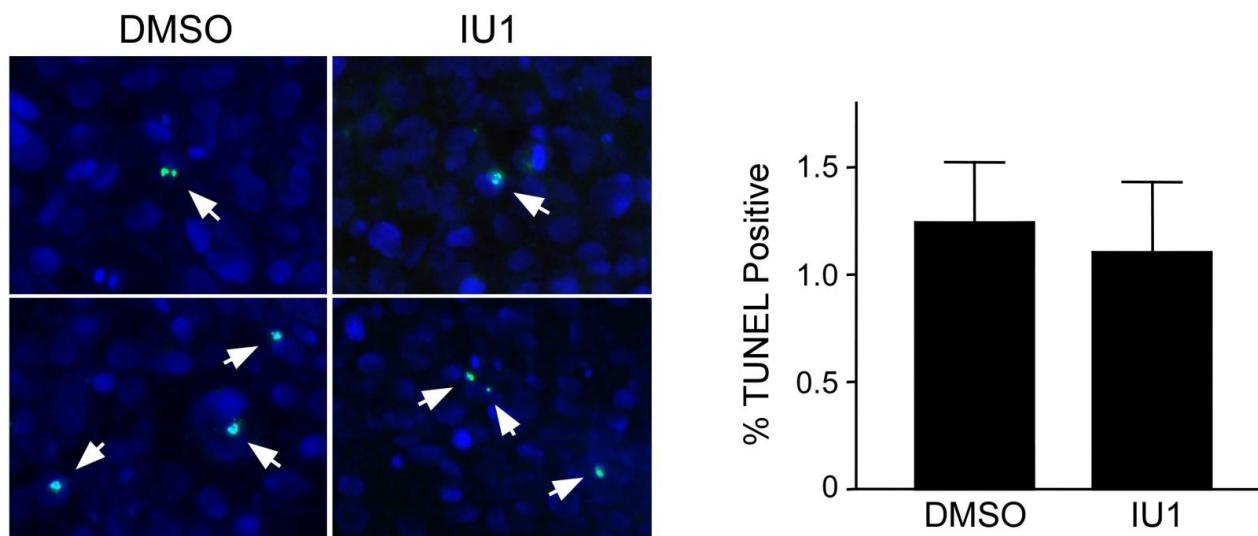
Supplementary Fig. 20



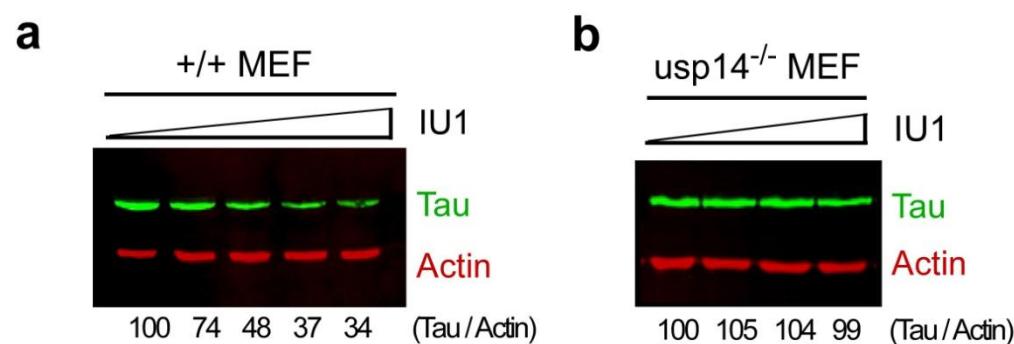
Supplementary Fig. 21



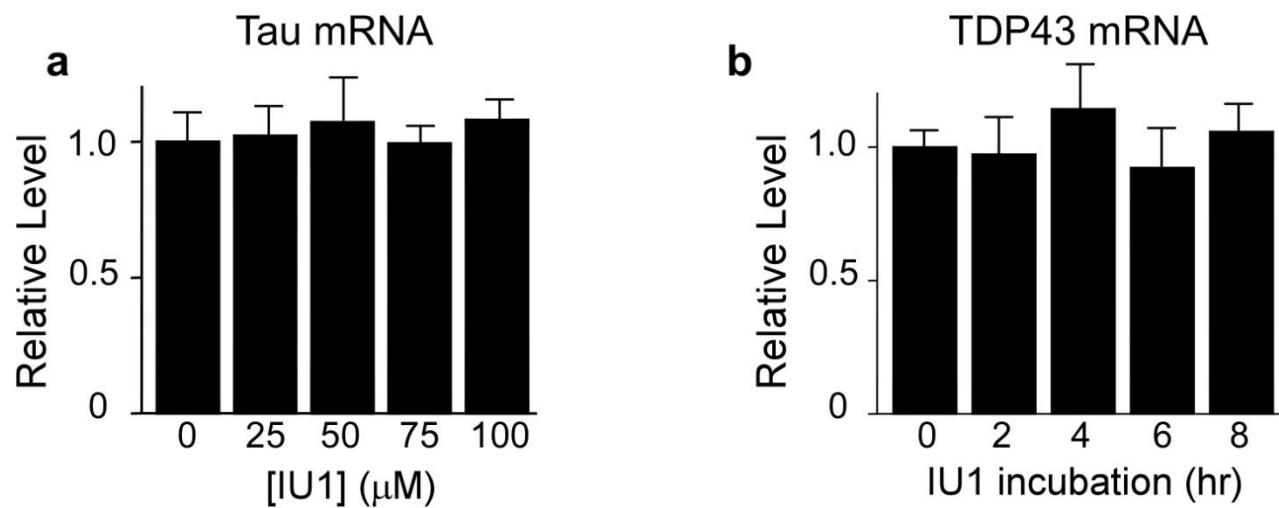
Supplementary Fig. 22



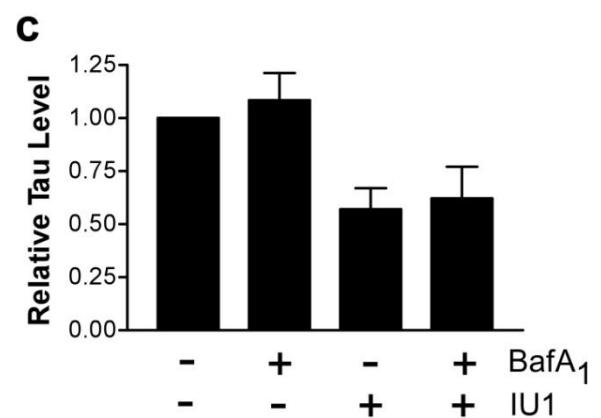
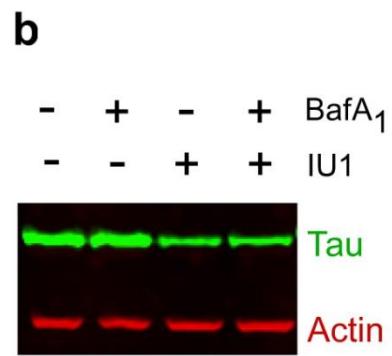
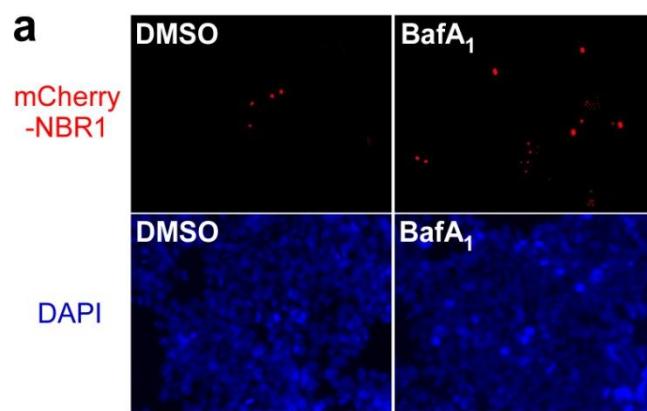
Supplementary Fig. 23



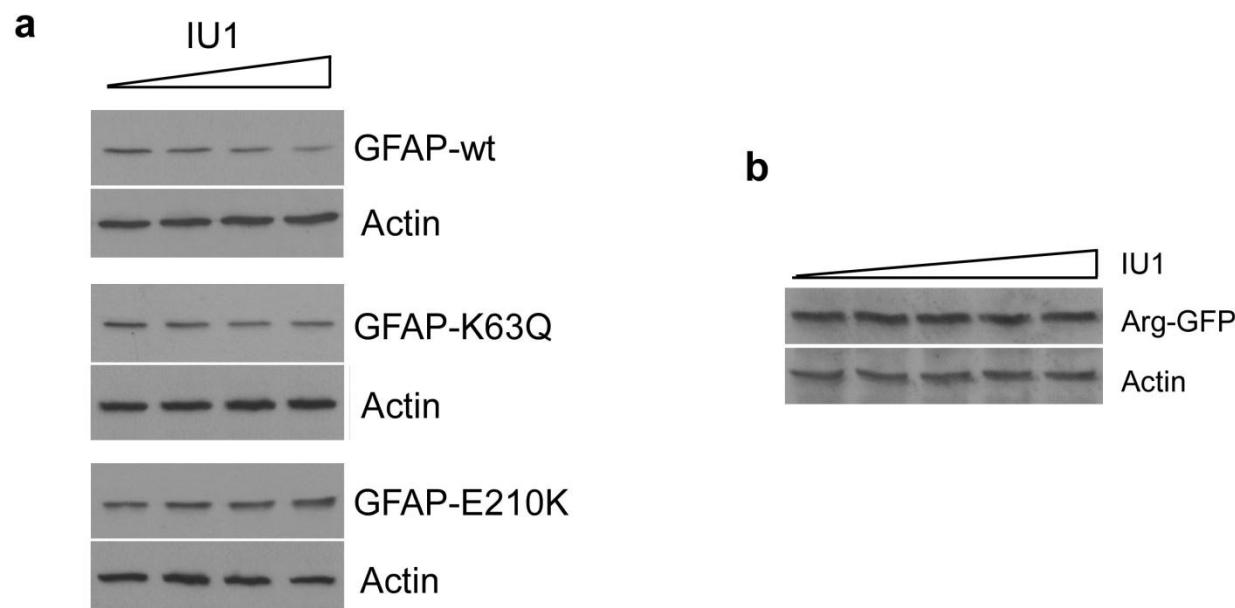
Supplementary Fig. 24



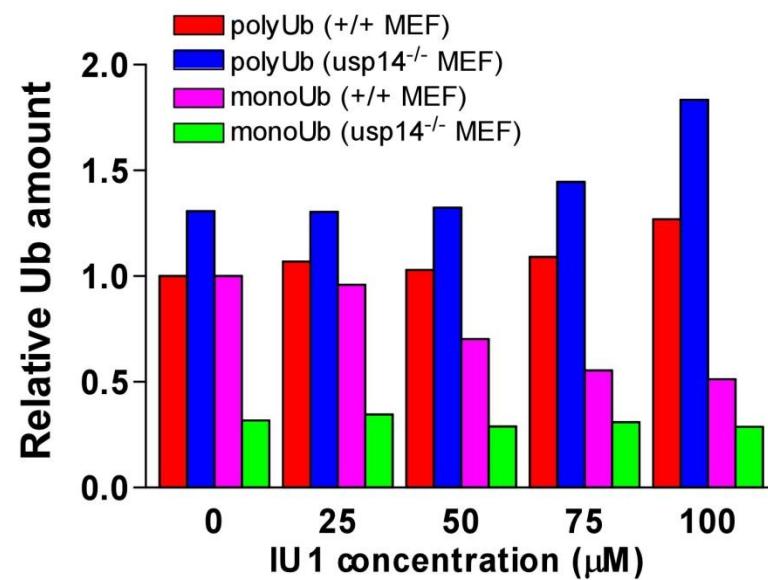
Supplementary Fig. 25



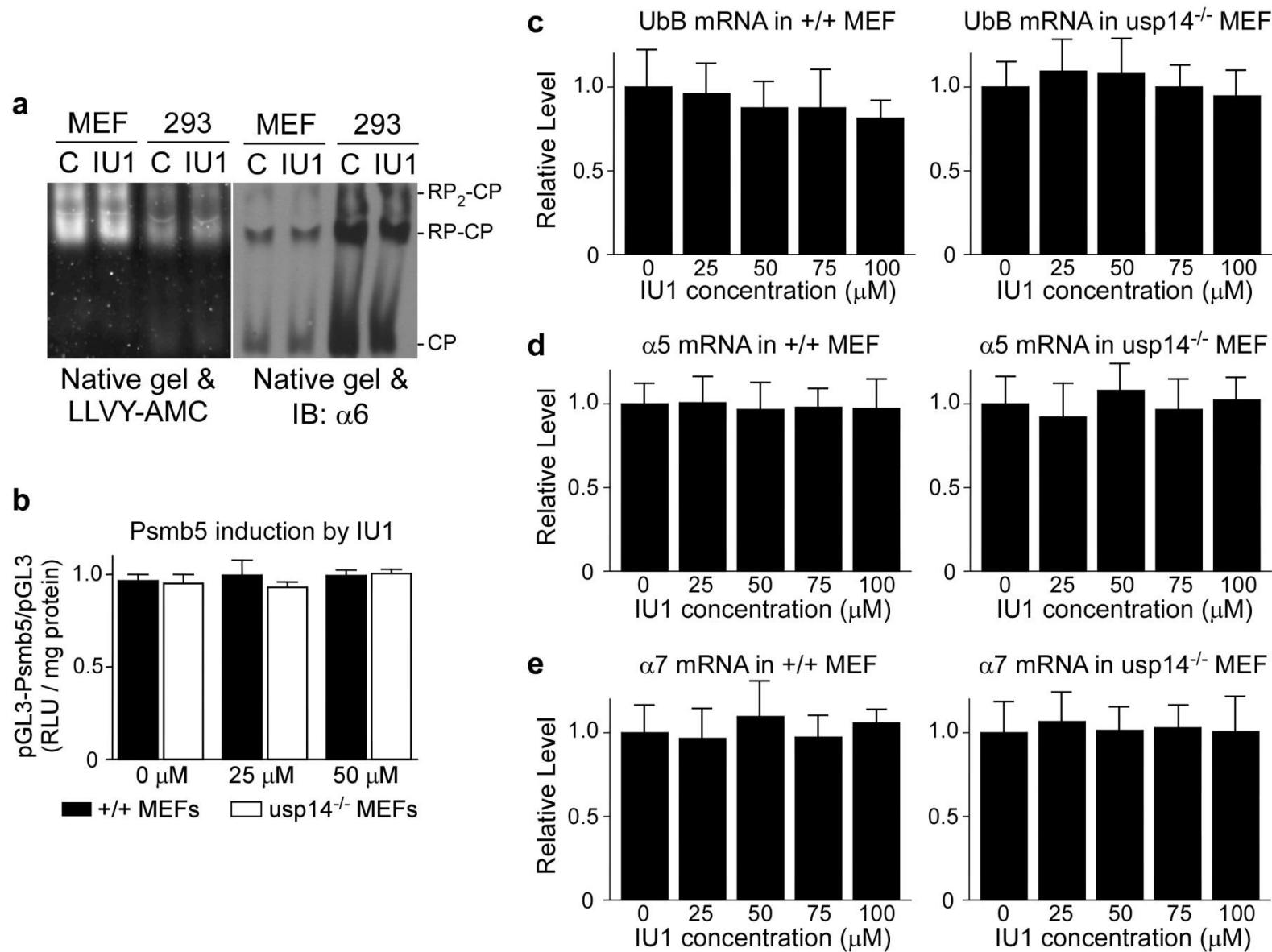
Supplementary Fig. 26



Supplementary Fig. 27

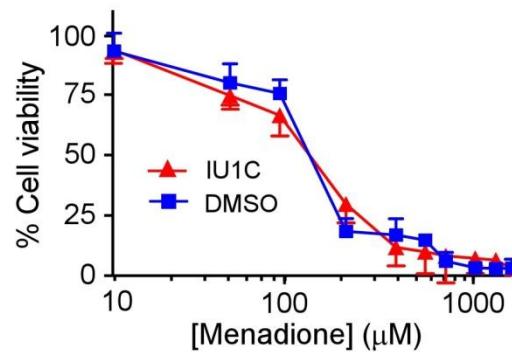


Supplementary Fig. 28

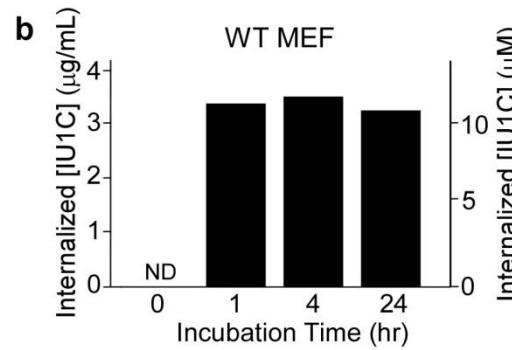


Supplementary Fig. 29

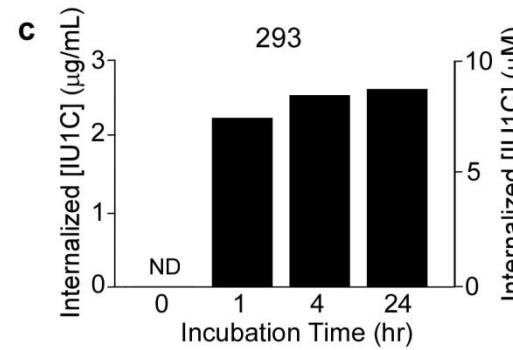
a



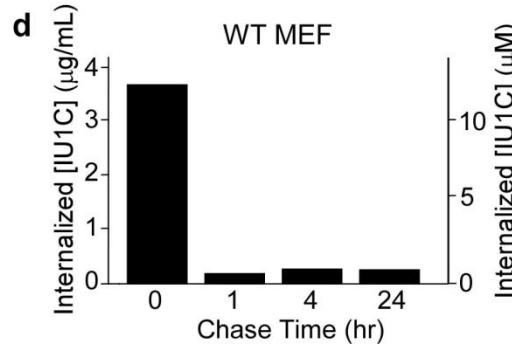
b



c



d



e

