

6. Gardel, M. L. *et al.* Elastic behavior of cross-linked and bundled actin networks. *Science* **304**, 1301–1305 (2004).
7. Sherman, M. B. *et al.* The three-dimensional structure of the *Limulus* acrosomal process: a dynamic actin bundle. *J. Mol. Biol.* **294**, 139–149 (1999).
8. Schmid, M. F. Cross-correlation and merging of crystallographic reflections derived from cryoelectron micrographs of 3D crystals: application to the *Limulus* acrosomal bundle. *J. Struct. Biol.* **144**, 195–208 (2003).
9. Schmid, M. F., Agris, J. M., Jakana, J., Matsudaira, P. & Chiu, W. Three-dimensional structure of a single filament in the *Limulus* acrosomal bundle: scruin binds to homologous helix-loop-beta motifs in actin. *J. Cell Biol.* **124**, 341–350 (1994).
10. Galkin, V. E. *et al.* The location of ubiquitin in *Lethocerus* arthrin. *J. Mol. Biol.* **325**, 623–628 (2003).
11. Galkin, V. E. *et al.* The bacterial protein SipA polymerizes G-actin and mimics muscle nebulin. *Nature Struct. Biol.* **9**, 518–521 (2002).
12. Galkin, V. E. *et al.* The utrophin actin-binding domain binds F-actin in two different modes: implications for the spectrin superfamily of proteins. *J. Cell Biol.* **157**, 243–251 (2002).
13. Orlova, A. *et al.* Probing the structure of F-actin: cross-links constrain atomic models and modify actin dynamics. *J. Mol. Biol.* **312**, 95–106 (2001).
14. Galkin, V. E., Orlova, A., Lukoyanova, N., Wriggers, W. & Egelman, E. H. Actin depolymerizing factor stabilizes an existing state of F-actin and can change the tilt of F-actin subunits. *J. Cell Biol.* **153**, 75–86 (2001).
15. McGough, A., Pope, B., Chiu, W. & Weeds, A. Cofilin changes the twist of F-actin: implications for actin filament dynamics and cellular function. *J. Cell Biol.* **138**, 771–781 (1997).
16. Jiang, W., Baker, M. L., Ludtke, S. J. & Chiu, W. Bridging the information gap: computational tools for intermediate resolution structure interpretation. *J. Mol. Biol.* **308**, 1033–1044 (2001).
17. Kabsch, W., Mannherz, H. G., Suck, D., Pai, E. F. & Holmes, K. C. Atomic structure of the actin:DNase I complex. *Nature* **347**, 37–44 (1990).
18. Holmes, K. C., Popp, D., Gebhard, W. & Kabsch, W. Atomic model of the actin filament. *Nature* **347**, 44–49 (1990).
19. Dominguez, R. & Graceffa, P. Solution properties of TMR-actin: when biochemical and crystal data agree. *Biophys. J.* **85**, 2073–2074 (2003).
20. Graceffa, P. & Dominguez, R. Crystal structure of monomeric actin in the ATP state. Structural basis of nucleotide-dependent actin dynamics. *J. Biol. Chem.* **278**, 34172–34180 (2003).
21. Sablin, E. P. *et al.* How does ATP hydrolysis control actin's associations? *Proc. Natl Acad. Sci. USA* **99**, 10945–10947 (2002).
22. Holmes, K. C., Angert, I., Kull, F. J., Jahn, W. & Schroder, R. R. Electron cryo-microscopy shows how strong binding of myosin to actin releases nucleotide. *Nature* **425**, 423–427 (2003).
23. Borovikov, Y. S. *et al.* Fluorescence depolarization of actin filaments in reconstructed myofibers: the effect of S1 or pPDM-S1 on movements of distinct areas of actin. *Biophys. J.* **86**, 3020–3029 (2004).
24. Otterbein, L. R., Graceffa, P. & Dominguez, R. The crystal structure of uncomplexed actin in the ADP state. *Science* **293**, 708–711 (2001).
25. Egelman, E. H. Actin allostery again? *Nature Struct. Biol.* **8**, 735–736 (2001).
26. Egelman, E. H., Francis, N. & DeRosier, D. J. F-actin is a helix with a random variable twist. *Nature* **298**, 131–135 (1982).
27. Way, M., Sanders, M., Garcia, C., Sakai, J. & Matsudaira, P. Sequence and domain organization of scruin, an actin-cross-linking protein in the acrosomal process of *Limulus* sperm. *J. Cell Biol.* **128**, 51–60 (1995).
28. Bullitt, E. S., DeRosier, D. J., Coluccio, L. M. & Tilney, L. G. Three-dimensional reconstruction of an actin bundle. *J. Cell Biol.* **107**, 597–611 (1988).
29. Sanders, M., Way, M., Sakai, J. & Matsudaira, P. Characterization of the actin crosslinking properties of the scruin-calmodulin complex from the acrosomal process of *Limulus* sperm. *J. Biol. Chem.* **271**, 2651–2657 (1996).
30. Mahadevan, L. & Matsudaira, P. Motility powered by supramolecular springs and ratchets. *Science* **288**, 95–100 (2000).

Supplementary Information accompanies the paper on www.nature.com/nature.

Acknowledgements This research is supported by the NCCR and NIGMS of NIH. We thank M. Baker for assistance in the helixhunter and foldhunter searches, and M. Dougherty for advice on graphical display.

Competing interests statement The authors declare that they have no competing financial interests.

Correspondence and requests for materials should be addressed to W.C. (wah@bcm.tmc.edu). The accession number is EMD-1088.

addendum

Pathways towards and away from Alzheimer's disease

Mark P. Mattson

Nature **430**, 631–639 (2004).

In the list of treatments given in Fig. 3 of this Review Article, I would like to add “Glutamate-receptor modulating agents (**2, 3, 4, 6**)”, where the numbers in bold indicate the sites of action in the pathogenesis pathway. □

corrigendum

Sirtuin activators mimic caloric restriction and delay ageing in metazoans

Jason G. Wood, Blanka Rogina, Siva Lavu, Konrad Howitz, Stephen L. Helfand, Marc Tatar & David Sinclair

Nature **430**, 686–689 (2004).

There are errors in Fig. 4 of this Letter: panels a and d are correct; however, panel c was incorrectly published as a duplicate of panel a, and panel b should have been labelled as panel c instead. The new panel b is shown here. □

