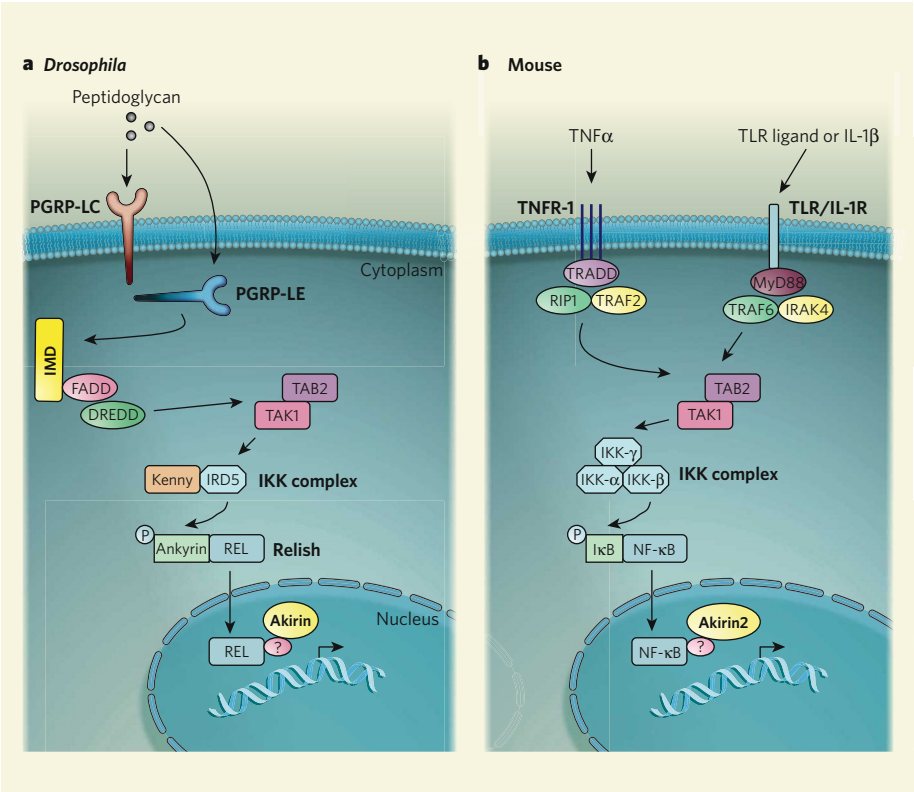

Figure 1 | Role of Akirin proteins in producing immune mediators following microbial infection. **a**, In *Drosophila*, peptidoglycan components of Gram-negative bacteria activate the Imd pathway, which results in the movement of Relish (an NF-κB-like transcription factor) to the nucleus. Relish then mediates transcription of genes that encode antimicrobial peptides. Goto *et al.*[1] identify Akirin, a nuclear factor that acts late in this signalling cascade and is required for Relish-mediated gene transcription. **b**, In mammals, the activation of the TNF receptor 1 (TNFR-1), Toll-like receptor (TLR) or interleukin-1 receptor (IL-1R) turns on a signalling cascade that results in movement of NF-κB to the nucleus and activation of gene transcription. The authors find that, in mice, a structurally highly conserved homologue of *Drosophila* Akirin, Akirin2, is required for NF-κB-mediated gene transcription.

Moreover, they found that Akirin deficiency does not affect the Toll pathway, suggesting that this protein is involved in the production of antimicrobial peptides only through the Imd pathway. Consistent with these *in vitro* findings, reducing Akirin levels in live flies using RNA interference increased the flies' susceptibility to infection with Gram-negative bacteria. These findings clearly establish Akirin's role in the Imd signalling pathway. But this protein probably has other functions too. Goto *et al.* show that mutant flies lacking the *Akirin* gene are not viable, implying a crucial role in *Drosophila* embryonic development.

Does Akirin have a similar function in mammals? In looking at this question, the authors find that structurally highly conserved *Akirin* is present in mice as two homologues (*Akirin1* and *Akirin2*). To investigate the function of mammalian Akirins, they generated mice deficient in either *Akirin1* or *Akirin2*. Neither *Akirin1*-deficient mice nor cells derived from these animals have any obvious unusual characteristics. However, the function of Akirin1 could be hidden through functional redundancy in the presence of Akirin2, a point that requires further investigation.

Like *Akirin* in *Drosophila*, *Akirin2* is required for embryonic development, and Goto *et al.* found that mice lacking this gene die by embryonic day 9.5. Fibroblast cells derived from *Akirin2*-deficient mouse embryos showed selective defects in NF-κB-dependent gene expression following stimulation through pathways involving the Toll-like receptor, interleukin-1 receptor or TNF receptor. All of these pathways converge on the activation of the mammalian TAB2–TAK1 complex, which in turn activates the IKK complex. Through phosphorylation, the active IKK complex causes the degradation of the NF-κB inhibitor Iκ-B, allowing NF-κB to enter the nucleus (Fig. 1b). The authors postulate that, like *Drosophila* Akirin, which acts downstream of Relish, Akirin2 functions downstream of NF-κB.

How do Akirins regulate gene transcription in the nucleus? Although preliminary studies failed to show a direct interaction of Akirins with DNA or with Relish, it is possible that they interact with an intermediary molecule that then engages with DNA and/or Relish, or is otherwise involved in transcription. It is also likely that Akirins are involved in regulating transcription factors other than NF-κB. The fact that Akirin is a potential modulator of the Wnt–Wingless developmental pathway in *Drosophila*[8] suggests that it might regulate the associated β-catenin transcription factor. Similarly, Akirin could be involved in regulating the GATA transcription factor, as it interacts with the GATA-related protein pannier, which is essential for thorax development in *Drosophila*[9].

A clear picture emerges: the functions of Akirins probably extend beyond the immune system, as do those of many other genes involved in immunity, and which also have roles in development. The *toll* gene, for example, which is essential for innate immune responses in *Drosophila*, was first identified as a developmental gene. So the results of Goto *et al.* have opened avenues of research that not only may help to unravel the complexities of the inflammatory signalling pathway in which Akirins function, but also may aid our understanding of the function of these molecules in embryonic development. ■

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Correction

In the News & Views article on thermoelectric silicon nanowires "Materials science: Desperately seeking silicon" by Cronin B. Vining (*Nature* **451,** 132–133; 2008), we unfortunately swapped the contexts in which the experiments in the two papers concerned were conducted. Hochbaum *et al.* (reference 4 of the article) suspended their nanowires above a silicon substrate, whereas those of Boukai *et al.* (reference 3) were supported on a thin silica platform that was fully suspended in a vacuum. The nanowire cross-sections of Hochbaum *et al.* were also not perfectly circular, but irregularly shaped, with diameters between 20 and 300 nm.