



50 Years Ago

'Evidence for life on Mars' — My opinion is that the evidence has been distorted and that a re-examination is required. ... As an alternative to the interpretation of life on Mars, I prefer an inorganic explanation based on ideas of McLaughlin and Kuiper. Assuming volcanoes, both active and dead, and suitable winds, the phenomena can be interpreted in a reasonably consistent manner. ... The question of life on Mars has intrigued scientists for decades. Owing to the possibility of being able to verify directly the life hypothesis in the very near future it is becoming a subject of widespread study. ... On the basis of this brief discussion it is suggested that the life interpretation is very tenuous and that inorganic interpretations be given greater credence.

From *Nature* 12 October 1963

100 Years Ago

The National Gas Exhibition at Shepherd's Bush, which will be open during the whole of October, affords the best object lesson in gas lighting that the public has ever had the opportunity of studying ... In domestic heating the grasping of the conditions necessary to make gas a hygienic domestic fuel has been the great factor that has led to progress. In the early days of the gas fire, only 25 to 33 per cent. of the heat was given out as radiant heat, and convection was relied upon largely to give the heating effect, this giving hot air to breathe, and at the same time leaving the objects in the room often so far below the body temperature as to lead to chill ... Another very suggestive exhibit is a series of compartments illustrating the effect of the colour and surface of wall-papers on the amount of illumination obtained from equal sources of light.

From *Nature* 9 October 1913

CELL BIOLOGY

Molecular clearance at the cell's antenna

The degradative process known as autophagy is a cellular quality-control mechanism that is associated with many clinical disorders. It emerges that autophagy and the cell's primary cilium regulate each other. [SEE ARTICLE P.194 AND LETTER P.254](#)

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Long considered a vestigial organelle, the primary cilium has lately been identified as the cell's sensory antenna. It extends from the cell surface to the extracellular space, and so is ideally positioned to receive signals from outside. On sensing such signals, it integrates and transduces them to coordinate an appropriate cellular response and decide the cell's fate¹. The fact that the primary cilium is present in most human cells, together with the discovery of its sensory function and the identification of cilium-related human disorders that include polycystic kidney disease,

*This article and the papers under discussion were published online on 2 October 2013.

retinal degeneration and hydrocephalus, have all contributed to the recent explosion of interest in this organelle. In this context, the findings of Pampliega *et al.*² and Tang *et al.*³, published in this issue, are of great importance*. They describe a role for autophagy — a pathway for the degradation of cellular components⁴ — in the development of the primary cilium (ciliogenesis) and, reciprocally, the involvement of this organelle in regulating autophagy.

The primary cilium consists of a backbone of microtubules arranged into a structure called the axoneme, which is covered by the cell membrane. It grows from another organelle known as the basal body (Fig. 1). During ciliogenesis, intracellular vesicles recruit protein building blocks and shuttle them to the growing cilium⁵.

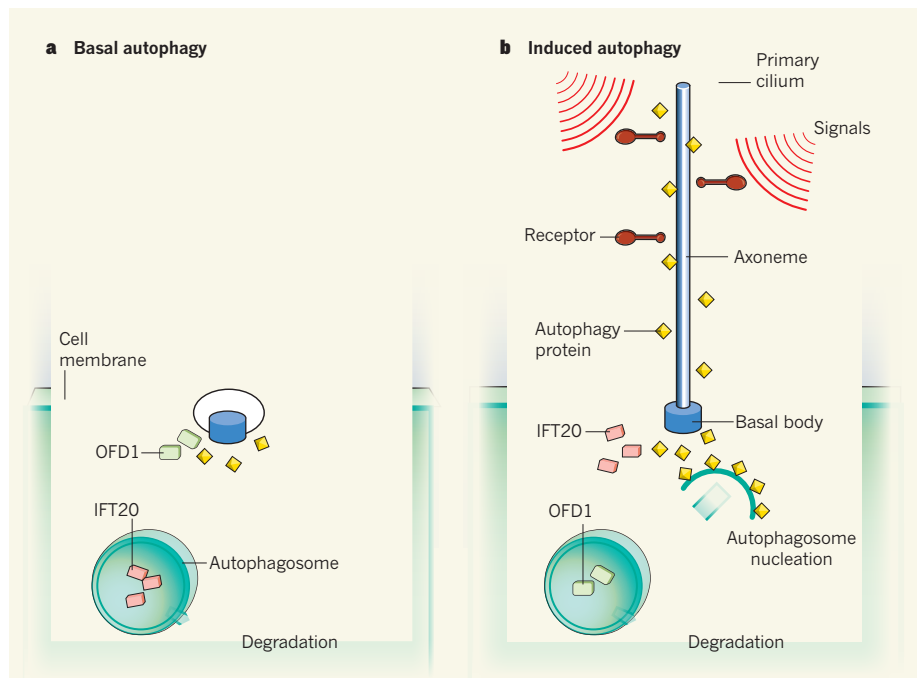


Figure 1 | Ciliogenesis and autophagy. Two studies^{2,3} find that autophagy participates in ciliogenesis, and that the primary cilium is in turn necessary for full induction of autophagy. **a**, Specifically, in basal autophagy, ciliogenesis is prevented by the sequestering of IFT20 (a protein that is essential for cilium formation) in autophagosomes and by its autophagic degradation. OFD1, a protein that inhibits cilium formation, is not affected by basal autophagy. **b**, By contrast, autophagy induced by serum deprivation promotes ciliogenesis through inactivation of OFD1, while sparing IFT20. The primary cilium consists of the axoneme covered by the cell membrane and is attached to the basal body. Autophagy proteins also localize at this sensory organelle, probably contributing to cilium organization. At the basal body, signals from the cilium stimulate autophagosome nucleation.