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Theodoulou, F. L. 2015. *Who wants to live forever?* Portland Press Ltd.  
doi:10.1042/BIO03704003

The publisher's version can be accessed at:

- <https://dx.doi.org/10.1042/BIO03704003>

The output can be accessed at: <https://repository.rothamsted.ac.uk/item/8v147/who-wants-to-live-forever>.

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**Production by** Portland Press Limited

**Director of Publishing:** Niamh O'Connor

**Publishing Operations Manager:** Michael Cunningham

**Typesetting and layout:** Rowena Weedon

**Design by** Peter Jones

**Printed by** Cambrian Printers Ltd, Aberystwyth

Published by Portland Press Limited six times a year  
(February, April, June, August, October and December).  
©2015 Biochemical Society  
ISSN 0954-982X (Print); ISSN 1740-1194 (Online)

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Registered charity no. 253894

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# Who wants to live forever?

by Freddie Theodoulou, Science Editor



So bellowed Brian Blessed, leaping astride Prince Vultan's rocket cycle to battle the Emperor Ming in the cult 1980 film, *Flash Gordon*. Good question. The real Brian Blessed it seems is still going strong and reportedly aims to climb Everest in his seventies so he may be hoping to stay vigorous for a while longer. Is

the answer in his genes, lifestyle or both? In this issue, we explore the biochemical basis of longevity.

Certain modular and simple multicellular animals can effectively be considered immortal thanks to pluripotent stem cells but who wants to be a Hydra or a sponge? Amongst more complex organisms, plants hold the record for individual long life, with a bristlecone pine dubbed Methuselah clocking almost 5,000 years of existence. Despite the efforts of scientists, the lifespans of the oldest humans don't come close to that of the eponymous biblical supercentenarian, although many animals are very long-lived, with sharks, clams, tubeworms and tortoises reportedly celebrating several hundreds of birthdays. Such extremes hint at genetic factors underpinning longevity: these have remained elusive for most of human history but biochemists are beginning to unpick mechanisms which regulate cellular aging and discover how these interact with the environment. Here, our feature authors explain how model organisms can help to unravel the mystery of longevity and how caloric restriction, stress and other factors all impact on lifespan, even before birth.

It seems to be part of the human condition to meditate on our mortality and literature and legend are replete with fantasies of eternal or at least extended life. A common theme is that immortality always carries a price, be it ennui (Borges' *The Immortal*), descent into depravity (Oscar Wilde's *Dorian Gray*) or an unpleasant compromise such as having the gift of eternal life but not eternal youth (Tithonus in Greek myth). A biologist might add one more: overpopulation. So while we're waiting for science and society to work out how to extend human lifespan without negative consequences, maybe the answer is not to live forever, but to live well. Aldous Huxley explores this theme in his novel *After Many a Summer [dies the swan]*, borrowing a line from Tennyson's poem *Tithonus* for the title. The fate of The Fifth Earl of Gonister, who reaches the age of 200 at the expense of becoming a repellent homunculus, makes caloric restriction seem positively appealing.

One question to consider is to what extent aging and mortality are determined by selection. Thomas Kirkwood (pages 8-11) argues that aging is a by-product of evolution rather than a developmental programme with adaptive value. An uplifting thought is that, although evolution has no need for us to remain physically robust after reproducing successfully, the protracted existence of those who do may bring wisdom and perspective. A 104 year old man was once asked in a Radio 4 interview if there were any benefits to his great age. There was a significant pause, and then came the confident answer: "Lack of peer pressure". ■

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