

# Benchmark database of lifespan-extending drugs announced

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Scientists from the Biogerontology Research Foundation (BGRF) and University of Liverpool have announced a landmark database of lifespan-extending drugs and compounds called [DrugAge](#). The database has 418 compounds, curated from studies spanning 27 different model organisms including yeast, worms, flies and mice. It is the largest such database in the world at this time. Significantly, the study found that the majority of age-related pathways have not yet been targeted pharmacologically, and that the pharmacological modulation of aging has by and large focused upon a small subset of currently-known age-related pathways. This suggests that there is still plenty of scope for the discovery of new lifespan-extending and healthspan-extending compounds.

DrugAge is the latest of a number of valuable resources freely available on the Human Aging Genomic Resources (HAGR) website created and maintained by the Integrative Genomics of Ageing Group at the University of Liverpool, led by Biogerontology Research Foundation Trustee Joao Pedro de Magalhaes, in collaboration with many other scientists worldwide, including BGRF Chief Science Officer and CEO of Insilico Medicine, Alex Zhavoronkov, PhD. Other resources available through HAGR include GenAge (a [database](#) of age and longevity-related genes in humans and model organisms), AnAge (a database on ageing, longevity records and life-history featuring over 4000 species), GenDR (a database of genes associated with the life extending effects of dietary restriction), and LongevityMap (a database of over 2000 human genes and genetic variations associated with longevity).

"DrugAge is the latest database created by Joao Pedro de Magalhaes, a world leader in the application of advanced bioinformatics and integrated computational approaches to biogerontology and ageing research. I am confident that it will gain widespread use in the ageing research community, and represents a significant milestone along the way to the coming paradigm shift in modern healthcare away from single disease treatment and toward geroprotective multi-disease prevention," said Dmitry Kaminskiy, Managing Trustee of the Biogerontology Research Foundation.

The database is freely available to the public, and is searchable according to compound name, species and effect on lifespan. The data can be presented as both tables and interactive charts. Functional enrichment analysis of the targets of the database's compounds was performed using drug-gene interaction data, which revealed a modest but statistically significant correlation between the cellular targets of the database's compounds and known age-related genes.

The database encompasses the earlier efforts published by the BGRF scientists, Joao Pedro de Magalhaes, PhD and Alex Zhavoronkov, PhD as an open resource called Geroprotectors.org. The publication is available at <http://www.aging-us.com/article/100799> .

"DrugAge represents a landmark resource for use in the biogerontology community. It is the largest database of lifespan-extending compounds compiled to date, and will surely come to be recognized as an extremely valuable resource for biogerontologists. Analysis performed using the database has already revealed interesting trends, including a modest but statistically significant overlap between lifespan-extending drugs and known age-related genes, a strong correlation between average/median lifespan changes and maximum lifespan changes, a strong correlation between the lifespan-extending effects of compounds between males and females, and perhaps most significantly that most known age-related

pathways have yet to be targeted pharmacologically. More broadly, an understanding of the comparative effects of geroprotectors upon the lifespan of a variety of different model organisms is important both for basic research into the biology of ageing, demonstration of lifespan plasticity via modulation of a variety of distinct biomolecular targets as proof to regulators that healthspan extension is a viable paradigm for disease treatment and prevention, and for the eventual clinical translation of potential geroprotectors," said Franco Cortese, Deputy Director and Trustee of the Biogerontology Research Foundation.

"Besides introducing the DrugAge database to the larger scientific community, this paper's overarching significance lies in the finding that the large majority of known age-related pathways have not yet been targeted pharmacologically, and that we are in a very real sense at the starting line of the search for pharmacological agents capable of extending lifespan and healthspan via the modulation of known age-related pathways. There is still very much left to learn," said Joao Pedro de Magalhaes, PhD, a Trustee of the Biogerontology Research Foundation (BGRF) and a Principal Investigator at the University of Liverpool's Integrative Genomics of Aging Group (IGAG).

The paper 'The DrugAge database of ageing-related drugs' has been published in the journal *Aging Cell*.

**More information:** *Aging Cell*, [DOI: 10.1111/acer.12585](https://doi.org/10.1111/acer.12585)

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