

Red-Wine Compound May Hold Secret to Fountain of Youth, Harvard Researchers Believe

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By Jacob Gaffney

Anyone who refers to red wine as *l'eau de vie* may be onto something. A team of researchers from Harvard Medical School's department of pathology has found that resveratrol, a polyphenol found in red wine, can extend the life span of yeast cells by 70 percent on average.

Although tests have not yet been done on humans, study co-author David Sinclair believes that the same process through which resveratrol increases longevity in yeast may also work higher up the evolutionary ladder.

Resveratrol is found in grapes, certain nuts and berries and even some types of wheat. Recent studies have shown that the compound may help [reduce cholesterol levels and improve cardiovascular health](#), [prevent some types of cancer](#), and [reduce the growth of skin melanomas](#).

Those health benefits are believed to be due to resveratrol's antioxidant and blood-thinning capabilities, but are only part of how the compound may increase longevity, according to Sinclair. "Any life-span extension would be due to disease prevention," he said. "We cannot extend life unless we increase health."

However, a secondary process -- which the scientists observed in the yeast -- may work in tandem with resveratrol's ability to fend off certain diseases, according to the research, published Sunday in the online edition of the journal *Nature*.

In the study, the yeast was prepared in a glucose solution to start the aging process and simulate "deteriorating environmental conditions." When resveratrol was added, the compound activated a group of enzymes called sirtuins, which are thought to be part of a system that encourages cell survival in times of stress and thus influences aging.

The activation of the sirtuins helped the yeast cells to repair damage and bolster defenses by stabilizing and preventing the breakdown of DNA. That allowed the yeast to live, on average, 70 percent longer than yeast samples in glucose without resveratrol.

"Even a 20 percent extension would have been impressive," said Sinclair, a molecular biologist. "We set out on a quest, but we didn't expect to uncover a Holy Grail."



Study co-author David Sinclair found that yeast cells lived 70 percent longer when exposed to resveratrol.

The team also conducted the experiment with two plant flavonoids not found in red wine, butein and fisetin, which helped to extend yeast life by 31 percent and 55 percent, respectively.

The best results were seen with smaller amounts of resveratrol, at levels of 10 micromolars and 100 micromolars (a measurement of a substance's concentration in a solution). When the researchers upped the dosage to 500 micromolars, the yeast tended not to live any longer than the yeast in glucose only.

The concept that less resveratrol works better than more extends to humans, according to Sinclair. "A glass of any type of red wine should give you enough of the chemical resveratrol to potentially have the health benefits," he said. "I would hope that this work doesn't give people an excuse to drink excessive amounts of red wine."

Sinclair believes that plants produce resveratrol as a survival response to stress, to fend off infections and repair damage. He thinks that red wine is so high in resveratrol because grapes are "harvested when the vines are dehydrated." Plus, during red-wine fermentation, the grape skins, which contain most of the resveratrol, are kept in contact with the juice. The bottling process preserves resveratrol by keeping oxygen out.

Sinclair and his team will begin similar experiments on mice early next year and hope that their findings can be used to develop drugs to lengthen life or treat age-related illnesses in humans.

Sinclair acknowledges that there is a big gap on a biological level between yeast and humans and, since the science behind aging is very complex, it is impossible to predict if something that works with basic organisms may translate to humans.

He added that the research is not intended to see if humans can ultimately live to 200 years of age, but rather to increase their overall quality of life. "Our goal is to delay or prevent the occurrence of the common disease of old age," he said. "We are not interested in making people live longer unless they are healthier."