Six new groups of molecules could be the key to delaying aging

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Salix alba, more commonly known as white willow bark, is the most potent aging-delaying pharmacological intervention yet described. Credit: Wikimedia Commons

Hearing loss, brittle bones, sagging skin, a deteriorating mind: these are just some of the issues associated with growing old. For millennia,

humans have fought the process of aging using everything from fountains of youth to pricey face creams, all to no avail. But a group of Montreal-based researchers is coming ever closer to achieving healthy longevity—armed with the power of science.

In a study recently published in *Oncotarget*, researchers from Concordia University and Idunn Technologies assess how six previously identified plant extracts can delay aging by affecting different signalling pathways that set the pace of growing old.

Vladimir Titorenko is a biology professor and the study's senior author. He says that the potential of using these plant extracts for delaying the onset of age-related diseases is underscored by the fact that Health Canada classifies them as safe for human consumption. Five of them are recommended by the federal department as health-improving supplements with clinically proven benefits.

In the study, Titorenko and his co-authors confirmed that one extract is particularly effective: Salix alba, more commonly known as white willow bark, is the most potent aging-delaying pharmacological intervention yet described.

To make this identification, the researchers used yeast to test the effectiveness of the plant extracts. But why yeast? That's because, at a cellular level, aging progresses similarly in yeast and humans. In both, the pace of aging is defined by a distinct set of chemical reactions arranged into several cascades. These cascades, which scientists call "signalling pathways," regulate the rate of aging in a wide range of organisms.

Using yeast—the best cellular aging model—Titorenko and his colleagues monitored how the information flowing through each of these signalling pathways was affected by each of the six aging-delaying plant

extracts.

"It's known that some of these signalling pathways delay aging if activated in response to certain nutrients or hormones," he says. "These pathways are called 'anti-aging' or 'pro-longevity' pathways. Other signalling pathways speed up aging if activated in response to certain other nutrients or hormones. These pathways are called 'pro-aging' or 'pro-death' pathways."

Co-author Éric Simard, CEO of Idunn Technologies, explains that each of the six aging-delaying plant extracts targets a different anti-aging or pro-aging signalling pathway.

It is especially noteworthy that this study revealed the following features of the six plant extracts as potential tools in decelerating chronic symptoms and diseases of old age:

- They imitate the aging-delaying effects of the caloric restriction diet in yeast
- They slow yeast aging by eliciting a mild stress response
- They extend yeast longevity more efficiently than any lifespan-prolonging chemical compound yet described
- They delay aging through signalling pathways implicated in age-related diseases
- One of them delays aging via a previously unknown pathway
- They extend longevity and delay the onset of age-related diseases in organisms other than yeast

"This study is an important step forward for science because these signaling pathways could eventually delay the onset and progression of chronic diseases associated with human aging," says Simard, who has recently published a new book on the topic.

"These diseases include arthritis, diabetes, heart disease, kidney disease, liver dysfunction, stroke, neurodegenerative diseases like Parkinson's, Alzheimer's and Huntington's diseases, and many forms of cancer."

More information: Vicky Lutchman et al, Six plant extracts delay yeast chronological aging through different signaling pathways, *Oncotarget* (2014). DOI: 10.18632/oncotarget.10689