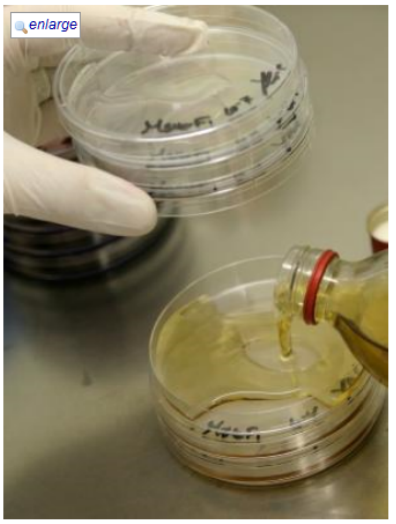
Science News

Fountain of Youth in Bile? Longevity Molecule Identified

ScienceDaily (Sep. 15, 2010) — The human quest for longer life may be one step closer, thanks to research from Concordia University. Published in the journal *Aging*, a new study is the first to identify the role of a bile acid, called lithocholic acid (LCA), in extending the lifespan of normally aging yeast. The findings may have significant implications for human longevity and health, as yeast share some common elements with people.



New research has identified the role of a bile acid, called lithocholic acid, in extending the lifespan of normally aging yeast. (Credit: iStockphoto/Jaime González)

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"Although we found that LCA greatly extends yeast longevity, yeast do not synthesize this or any other bile acid found in mammals," says senior author Vladimir Titorenko, Concordia University Research Chair in Genomics, Cell Biology and Aging and a professor in the Department of Biology. "It may be that yeast have evolved to sense bile acids as mildly toxic molecules and respond by undergoing life-extending changes. It is conceivable that the life-extending potential of LCA may be relevant to humans as well."

Over 19,000 small molecules screened

Titorenko and colleagues screened more than 19,000 small molecules to test their ability to extend yeast-lifespan. Under both normal and stressed conditions, LCA had a major impact.

"Our findings imply that LCA extends longevity by targeting two different mechanisms," says first author Alexander Goldberg, a Concordia doctoral student. "The first takes place regardless of the number of calories and involves the day-to-day or housekeeping proteins. The second system occurs during calorie-restriction and involves stressor proteins."

"Regardless of their triggers both of these mechanisms work to suppress the pro-aging process," he continues.

Bile acids may be beneficial to health

"Although we have an overall idea how LCA works to extend longevity in yeast, we still need to determine if this is the case for other species," says Titorenko. "We do know from previous studies, however, that bile acids are beneficial to health and longevity. For example, they have shown to accumulate in the serum of long living mice and play a role in improving rodent liver and pancreatic function."

"This leads us to believe that bile acids have potential as pharmaceutical agents for the treatment of diabetes, obesity and various metabolic disorders, all of which are age-related," continues Titorenko. "They may indeed offer hope for a healthy aging life."

This study was funded by the Canadian Institutes of Health Research, the Natural Sciences and Engineering Research Council of Canada, the Canada Foundation for Innovation and the Concordia University Chair Fund.

Story Source:

The above story is reprinted (with editorial adaptations by Science*Daily* staff) from materials provided by **Concordia University**.

Journal References:

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2. Alexander A. Goldberg, Vincent R. Richard, Pavlo Kyryakov, Simon D. Bourque, Adam Beach, Michelle T. Burstein, Anastasia Glebov, Olivia Koupaki, Tatiana Boukh-Viner, Christopher Gregg, Mylène Juneau, Ann M. English, Vladimir I. Titorenko and David Y. Thomas. **Chemical genetic screen identifies lithocholic acid as an anti-aging compound that extends yeast chronological life span in a TOR independent manner, by modulating housekeeping longevity assurance processes**. *Aging*,

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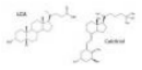

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