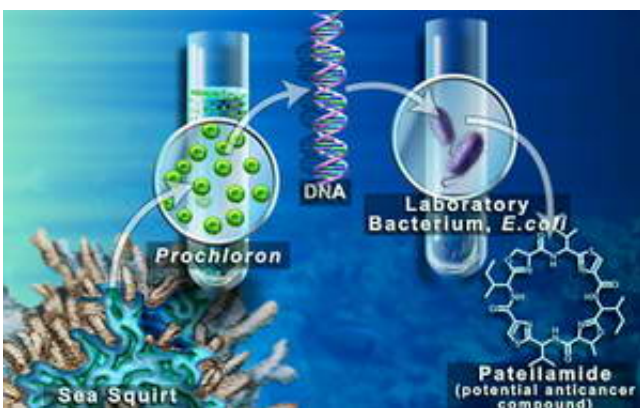


Bacterial genome sheds light on synthesizing cancer-fighting compounds

May 10 2005



Sea squirts around the world are breathing a sigh of relief, as they no longer run the risk of being harvested for their natural disease-fighting substances. Scientists recently discovered that the bacterium *Prochloron didemni*, which lives symbiotically inside the sea squirt, actually produces the desired patellamides, compounds that may one day be used in cancer treatment.

Image: Scientists discovered Prochloron didemni has the necessary genes to produce patellamides, compounds that may one day be used in cancer treatment. They were also able to transfer the patellamide genes to the laboratory workhorse bacterium, Escherichia coli, directing it to biosynthesize the product. Credit: Nicolle Rager Fuller, National Science

Foundation

Despite decades of attempts, scientists could not successfully cultivate Prochloron in the laboratory once the bacterium was isolated from the sea squirt. Because samples of Prochloron were easily contaminated with remnants of life inside its animal home, scientists couldn't tell if the bacterium or the sea squirt produced the sought-after patellamides, until now.

By searching for patellamide synthesis instructions in genomic sequences, scientists found the bacterium indeed has the necessary genes to produce these potentially important biochemicals, solving the source mystery. Knowing which genes Prochloron used for patellamide production also allowed researchers to synthesize the potentially important compounds in the lab using a so-called laboratory workhorse, the bacterium *E. coli*.

Scientists from The Institute for Genomic Research (TIGR), the University of Utah and the University of California, San Diego, report findings in this week's online edition of the Proceedings of the National Academy of Sciences.

"This project revealed detailed information about the metabolic capabilities of Prochloron, details that proved to be difficult to determine by other means, " said Patrick Dennis, manager for Prochloron genome sequencing at the National Science Foundation, which funded the study. "Furthermore, " he added, "by producing patellamides in the lab, the team demonstrated an important proof of principle for the biosynthesis of naturally occurring marine products."

Source: NSF

Citation: Bacterial genome sheds light on synthesizing cancer-fighting compounds (2005, May 10) retrieved 4 May 2024 from <https://phys.org/news/2005-05-bacterial-genome-cancer-fighting-compounds.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.