Ultrapotent compound may help treat C. diff, reduce recurrence

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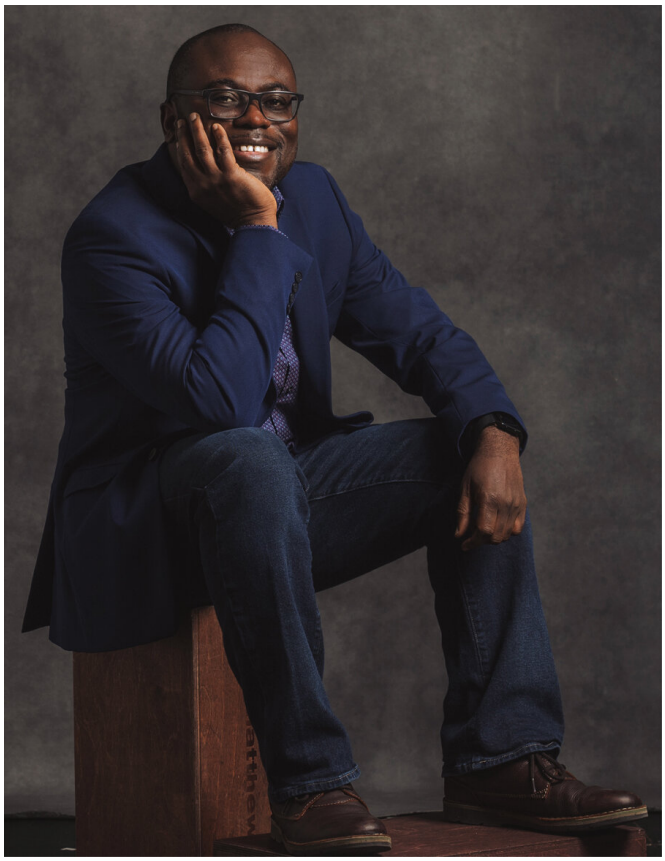

Herman O. Sintim, the Drug Discovery Professor of Chemistry in Purdue University's Department of Chemistry, has helped advance novel compounds to help treat patients with C. diff. Credit: Herman O. Sintim/Purdue University

Clostridioides difficile, or C. diff, is the leading cause of health care-associated infection in the U.S.

Only two antibiotics, vancomycin and fidaxomicin, are FDA approved for the treatment of C. diff, but even these therapies suffer from high treatment failure and recurrence.

Now, Purdue University innovators have advanced novel compounds they developed to help treat patients with C. diff, one of only four bacteria considered an urgent threat by the Centers for Disease Control and Prevention. Their work is published in the *Journal of Medicinal Chemistry*.

"Our compounds have several advantages, including ultrapotent activities with minimum inhibitory concentration values as low as 0.003 ?g/mL," said Herman O. Sintim, the Drug Discovery Professor of Chemistry in Purdue's Department of Chemistry. "Our compounds also do not kill good bacteria at concentrations that kill C. diff and performed significantly better than current antibiotics in preventing recurrence. These are significant advantages for patients dealing with this difficult bacterial infection."

The most promising of the Purdue compounds, containing trifluoromethylthio functional group, is HSGN-218. Sintim said it has been shown to be one of the most potent compounds ever produced for use against C. diff.

"This is part of our work to create new solutions to treat diseases and infections, which are resistant to current treatment options," said Sintim, who is a member of the Purdue University Center for Cancer Research and the Purdue Institute for Drug Discovery. "This work provides a potential clinical lead for the development of C. diff therapeutics and also highlights dramatic drug potency enhancement via halogen substitution."

More information: George Naclerio et al, Ultrapotent inhibitor of Clostridioides difficile growth, which suppresses recurrence in vivo, *Journal of Medicinal Chemistry* (2020). DOI: 10.1021/acs.jmedchem.0c01198

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