MedicalXpress

Deciphering the mutations behind drug resistance

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Antimicrobial resistance in disease-causing microbes has garnered attention in recent years, but another persistent area of drug resistance is the ability for tumors to evade chemotherapy drugs. Methotrexate is one of the oldest chemotherapy agents, and although it can be quite effective against many types of cancer and other conditions, in many cases it stops working because the patient becomes resistant to the drug's effects.

In a new study, researchers have developed a rapid, low-cost screening method to decipher the gene mutations behind drug resistance. They used baker's yeast to test the technique in the context of methotrexate resistance and identified 10 mutations that can confer resistance to the drug, offering potential new leads that could help scientists make the drug more reliable.

The research was led by postdoctoral fellow Lai Wong in the lab of Guri Giaever and Corey Nislow at the University of British Columbia, along with collaborator Pat Flaherty from the University of Massachusetts, Amherst. The method they developed is a "back-to-the-future" approach that combines a traditional screening approach for identifying sources of drug resistance with newer techniques of "massively parallel" and "deep" genetic sequencing, along with advanced statistical algorithms. The method is a significant improvement over existing techniques to understand the genetic mutations relevant to drug resistance. The technique's success in identifying methotrexate resistance mutations demonstrates its potentialBarrington will present "Pathophysiological responses to dietary patterns differ with genetic backgrounds" during

The Allied Genetics Conference from 11:45 a.m. to 12:00 p.m. on Friday, July 15, in Crystal Ballroom G1 at the Orlando World Center Marriott in Orlando, Florida. uses for understanding not only the mechanisms behind resistance for this important chemotherapy agent, but potentially for many other drugs as well.

Lai Wong will present this research on Thursday, July 14 from 9:30-9:45 p.m. during the Tackling Human Disease using Yeast session in Crystal Ballroom G2 as part of The Allied Genetics Conference, Orlando World Center Marriott, Orlando, Florida.

Provided by Genetics Society of America