NEWS | RESEARCH

NIT Rourkela discovers long pepper compound for colon cancer treatment

In lab testing, the identified compound has proven to be a low-dose, low-cost alternative to chemotherapy that selectively kills colon cancer cells while leaving healthy cells unharmed

By **Sanjiv Das** | November 26, 2025



> WordPress post #38099

In lab testing, the identified compound has proven to be a low-dose, low-cost alternative to chemotherapy that selectively kills colon cancer cells while leaving healthy cells unharmed

Researchers at National Institute of Technology Rourkela (NIT Rourkela) have identified a natural compound found in long pepper (pippali/thippili/maghaun) as an effective and cost-efficient agent against colon cancer cells. Colon cancer is a disease in which the cells grow uncontrollably in the large intestine of the body, forming tumours.

The findings of this research have been published in the prestigious journal BioFactors, in a paper co-authored by Prof Bijesh Kumar Biswal, Associate Professor, Department of Life Science, along with his research scholars, Rajeev Kumar Sahoo, Stuti Biswal, Sambit Kumar Patra, and Shikshya Swarupa Panda in collaboration with Dr. Surya Kant Tripathi from University of North Carolina, USA and Krishnendu Barik and Dr Anil Kumar from Central University of South Bihar.

The multi-institutional research team led by NIT Rourkela conducted a set of laboratory experiments to show the activity of Piperlongumine, a natural compound, as an alternative to chemotherapy. The research team found it to be selectively killing colon cancer cells while leaving healthy cells unharmed.

The team checked the viability of colon cancer cells after treatment with piperlongumine through MTT assay and reported significant cancer cell death. They validated these results of cell death using multiple assays including apoptotic induction, nuclear damage and mitochondrial dysfunction. Further, they reported that Piperlongumine increases oxidative stress inside colon cancer cells that they cannot handle, causing them to self-destruct. Normal cells, however, are not affected because they can easily manage this stress.

Since long pepper is an inexpensive, easily cultivated plant that already exists in the diet of a large portion of the Indian population, the formulation of piperlongumine offers a low-cost, green therapeutic alternative, especially beneficial for low and middle-income countries due to the exorbitant costs of cancer treatment.

Prof Bijesh Kumar Biswal, Associate Professor, Department of Life Science, NIT Rourkela, said, “This natural compound from long pepper has shown strong anticancer effects with minimal side effects, making it a promising and safer alternative therapy. Over time, many cancer patients stop responding to chemotherapy, meaning the treatment no longer works, which can increase the risk of death. As a next step, our team is investigating the use of piperlongumine alongside chemotherapeutic drugs such as oxaliplatin to help restore patients’ responsiveness to treatment. This discovery opens new possibilities for treating advanced and chemo-resistant colorectal cancer, where current treatment options are limited.”

Read online: https://nuffoodsspectrum.in/news/17/22916/nit-rourkela-discovers-long-pepper-compound-for-colon-cancer-treatment.html

© 2026 NUFFOODS Spectrum. All rights reserved.