

Yeast unravels effects of chemotherapy drugs

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Until now, the mode of action of nitrogen-containing bisphosphonate (N-BP) cancer drugs, used to relieve bone pain and to prevent skeletal complications in bone metastasis, has been almost entirely unknown. Researchers writing in BioMed Central's open access journal *Genome Biology* have used 'barcoded' yeast mutants to identify new biological processes involved in the cellular response to N-BPs, opening up opportunities for the development of new anticancer drugs.

Daniela Delneri, from the University of Manchester, UK, worked with Gianluca Tell and an Italian team of researchers to carry out the experiments. Delneri said, "We discovered two novel biological processes involved in the cytotoxic effects of the N-BPs, [DNA damage](#) and microtubule assembly, and, thanks to the novel 'barcode' approach, these could be linked directly to the responsible genes, DBF4 and TBCB."

The researchers used a collection of thousands of [yeast](#) mutants, each identified by a unique molecular barcode. By evaluating which yeasts grew best when exposed to N-BPs, they were able to identify potential drug targets and gain insight into the molecular changes occurring in cells exposed to such drugs. Speaking about the results, Delneri said, "Neither DBF4 nor TBCB have been described before as N-BP targets, and these findings may open up new opportunities for the development of new compounds with antitumor activity".

[More information:](#) Identification of secondary targets of N-containing bisphosphonates in mammalian cells via parallel competition analysis of

the barcoded yeast deletion collection; Nicoletta Bivi, Milena Romanello, Richard Harrison, Ian Clarke, David C Hoyle, Luigi Moro, Fulvia Ortolani, Antonella Bonetti, Franco Quadrifoglio, Gianluca Tell and Daniela Delneri; [Genome Biology](#) (in press); genomebiology.com/

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