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FLUORESCENCE-BASED REPORTERS FOR MUTAGENESIS DETECTION IN *E. COLI*

Tech ID: 33330 / UC Case 2017-264-0

BACKGROUND

When model organisms are exposed to chemicals, resulting mutagenesis can provide insights on the chemical's genotoxicity, which is an indicator of the chemical's potential to cause cancer or birth defects. In fact, direct mutagenesis assays in bacteria are one of the three assays required by regulatory agencies for demonstrating the safety of potential clinical compounds. Mutagenesis assays are also used to study various DNA processes, such as replication, repair, damage tolerization, and homeostasis.

TECHNOLOGY DESCRIPTION

Researchers at UC Santa Cruz have developed methods for detecting mutagenesis in *Escherichia coli* (*E. coli*), using reporter systems that can detect and quantify point mutations. The plasmid-based reporter system couples a TEM-1 β -lactamase marker and GFP fluorescent marker. Either marker can be mutated, and a reversion of a mutation indicates that a compound is mutagenic.

There are several benefits to coupling the markers. The reporters produce a quantitative output and allow for monitoring growth over time.



APPLICATIONS

- ▶ clinical safety testing
- ▶ genotoxicity studies

ADVANTAGES

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OTHER INFORMATION

KEYWORDS

Mutagenesis detection, Bacteria, *E. coli*, Environmental toxicity, Toxic compound detection, Quantitative mutagenesis, Fluorescent marker

CATEGORIZED AS

- ▶ **Research Tools**
 - ▶ Expression System
 - ▶ Nucleic Acids/DNA/RNA
 - ▶ Vectors

RELATED CASES

2017-264-0

- ▶ less labor-intensive mutagenesis assays
- ▶ reduces amount of test compounds needed for mutagenesis assays
- ▶ provides quantitative detection

INTELLECTUAL PROPERTY INFORMATION

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	11,788,113	10/17/2023	2017-264
United States Of America	Issued Patent	11,339,420	05/24/2022	2017-264

RELATED MATERIALS

- ▶ [Fluorescence-Based Reporters for Detection of Mutagenesis in E. coli - 06/09/2017](#)

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