

OFFICE OF TECHNOLOGY TRANSFER

AUBURN UNIVERSITY

Specific and Sensitive Detection of the Pathogen *E. coli* 0157:H7

Contact

Brian Wright
Auburn University
Office of Technology Transfer
334-844-4977
brian.wright@auburn.edu
http://ott.auburn.edu/
Reference: E. Coli

Inventor

Dr. Richard Musso

Overview

This invention is a novel means to detect *E. coli* 0157:H7. It is based on two distinct novel DNA amplification assays, PCR and Southern blotting, that can be run independently or multiplexed, resulting in a product characteristic of this bacterial pathogen. This technology has potential utility in the following areas:

- Meat industry, product quality control
- Food industry, product quality control
- Consumer use
- Clinical diagnostics

Advantages

- Rapid and sensitive detection of *E. coli* 0157:H7
- Distinction from all other tested strains of *Escherichia* and *Shigella* species

Description

One of the serious pathogens to recently emerge is the bacterium *Escherichia coli* 0157:H7, first recognized in 1982 as the cause of severe food poisoning outbreaks in Oregon, Michigan, and Ottawa, Canada, and more recently in Japan. The greatest notoriety for this bacterium was in 1993 when several hundred deaths resulted from under-cooked hamburgers at a fast-food chain in the Pacific Northwest.

The seriousness of concern about this pathogen derives from both the low infective dose required and the severity of symptoms: severe cramping and heavily bloody diarrhea followed in some cases by kidney damage, which may be permanent or even fatal. These symptoms result from a class of bacteria referred to as EHEC (Enterohemorrhagic *E. coli*) that is represented primarily by *E. coli* 0157:H7, but includes a few other stereotypes as well.

Several detection methods exist for this bacterial pathogen, which involve microbiological culturing on special indicator media, immunological detection of surface antigens and DNA amplification of virulence genes. In general, these methods must be used in combinations to discriminate between *E. coli* 0157:H7 and related strains of *Escherichia* and *Shigella* species.

This invention relates to diagnostic tests that will specifically identify *E. coli* 0157:H7 via PCR and Southern blotting. Methods and primer compositions are provided to identify two distinct and independent regions of the genome by PCR. Methods and probe compositions are also provided to detect *E. coli* 0157:H7 by Southern blotting. Kits for both methods are also provided.

Status

- United States Patent Number 6,291,168
- This has been successfully verified by laboratory experiment

Licensing Opportunities

- This technology is available for exclusive or non-exclusive licensing

[Click here for a listing of Auburn's available life science technologies](#)