# Fluorescence Assay For Intestinal Permeability

Tech ID: 33186 / UC Case 2014-954-0

## BACKGROUND

Currently, techniques such as LC-MS/MS and enzymology are used to assess gut permeability. This invention (along with the related invention linked here) allow rapid and inexpensive assessment of gut permeability using equipment readily available in small gastroenterology labs.

## TECHNOLOGY DESCRIPTION

This invention uses organoboranes in a lactulose/mannitol assay to assess small intestinal gut permeability. Subjects are fed lactulose and mannitol and their urine collected. Small intestinal permeability is assessed using the lactulose/riboflavin ratio in biological samples.

Specifically, a subject is fed riboflavin and one or both of lactulose and mannitol 0-24 hours before collection of a sample (e.g. a urine sample). An organoboronic compound (which can include an organoboronic acid such as viologen) coupled to a fluorophore is contacted with the sample. The fluroescence in the mixture is measured and normalized relative to riboflavin fluorescence. The amount of the lactulose and/or mannitol is then quantified using this normalized fluorescence emission.

This assay can be performed on a simple fluorimeter and therefore makes this type of analysis more accessible. The process can readily be combined with related technology 2014-918 which is attached.

## APPLICATIONS

Gut permeability diagnostics

Measurement of sugar concentration in solution

## ADVANTAGES

Non-invasive

Analytes accessible via urine

Patients are fed the analytes, analytes are safe, edible sugars.

Readily performed on a fluorimeter

## INTELLECTUAL PROPERTY INFORMATION

| Country | Type | Number | Dated | Case |
|---|---|---|---|---|
| United States Of America | Issued Patent | 10,488,418 | 11/26/2019 | 2014-954 |

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## OTHER INFORMATION

### KEYWORDS

gut permeability, small intestine permeability, urine test, sugar measurement, non-invasive, organoborane, fluorescent assay, lactulose, mannitol, riboflavin

### CATEGORIZED AS

- **Medical**
  - Diagnostics
  - Disease: Digestive System

### RELATED CASES

2014-954-0, 2014-918-0

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|---|---|---|---|---|
| United States Of America | Issued Patent | 10,274,483 | 04/30/2019 | 2014-918 |
| Patent Cooperation Treaty | Published Application | WO 2016/036887 | 03/10/2016 | 2014-954 |

## RELATED MATERIALS

- Rapid small intestinal permeability assay based on riboflavin and lactulose detected by bis-boronic acid appended benzyl viologens

## RELATED TECHNOLOGIES

- Simple and Rapid Method for the Quantification of Haloginated Dissaccharides (i.e. Sucralose) in an Aqueous Media

## ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

- Simple and Rapid Method for the Quantification of Haloginated Dissaccharides (i.e. Sucralose) in an Aqueous Media
- Rapid and accurate detection of sucralose in solution
- Producing aluminum oxide (alumina) from reaction of a gallium/aluminum alloy with water

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