



# Weill Cornell Medicine

## Theranostic Test for Antifungal Treatment of Inflammatory Diseases

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# Theranostic Test for Antifungal Treatment of Inflammatory Diseases

## Background & Unmet Need

- Intestinal fungi are an important component of the gut microbiota, with recent studies detailing their role in modulating host immune homeostasis and inflammatory disease
- Intestinal fungal dysbiosis has been shown to influence colitis, alcoholic liver disease, and allergic lung disease
- However, the specific mechanisms governing immunity to gut mycobiota are poorly understood
- **Unmet Need:** Improved methods of identifying and treating patients with fungal dysbiosis

## Technology Overview

- **The Technology:** A method for identifying IBD patients who may benefit from antifungal therapy based on the presence of CX3CR1 mutations
- **The Discovery:** CX3CR1+ mononuclear phagocytes (MNPs) are essential for the initiation of innate and adaptive immune responses to intestinal fungi
- In mouse models that lacked CX3CR1 signaling, the inventors observed a significant decrease in antibodies against *S. cerevisiae* as well as CX3CR1+ MNP populations
- These mice were susceptible to induced colitis in the presence of *C. albicans* and *C. tropicalis*
- **PoC Data:** Administration of the antifungal gent fluconazole in these mice reduced symptoms of colitis

## Inventors:

Iliyan D. Iliev  
Irina Leonardi

## Patents:

US Patent [11,712,436](#)  
[EP Application Filed](#)

## Publications:

[Leonardi et al. Science](#).  
2018.

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## Cornell Reference:

D-7980



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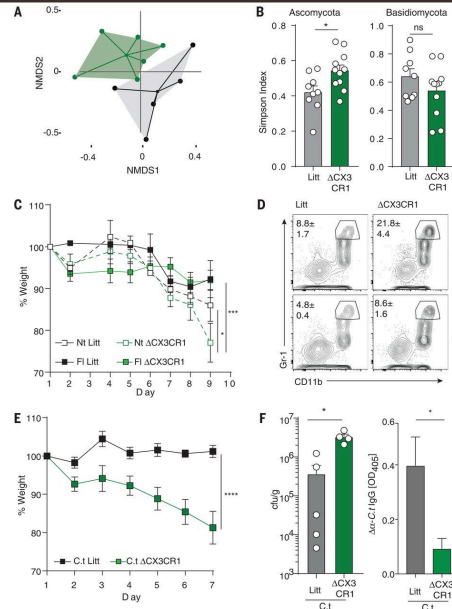
## Technology Applications

- Identification of IBD patients predisposed to gut fungal dysbiosis
- Stratification of IBD patients who may benefit from antifungal treatment
- Screening method for patients at risk of developing IBD

## Technology Advantages

- Theranostic test consists of straightforward PCR and ELISA-based assays
- Antifungal MOA is distinct from current therapies targeting inflammation

## Supporting Data / Figures



**Figure 1:** Depletion of CX3CR1+ mononuclear phagocytes affects gut mycobacteria and results in exacerbated intestinal disease.

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