

# Ex Vivo Drug Sensitivity Testing to Personalize Multiple Myeloma Treatment

## Category

Diagnostic Assay for Drug Response

## Problem

A clinical test to predict drug efficacy in multiple myeloma does not exist.

## Technology Overview

Assay to determine patient-specific drug sensitivity during multiple myeloma treatment.

## IP Status

- ▶ Patent Pending
- ▶ Available for Exclusive or Non-Exclusive Licensing

## Value Proposition

- ▶ Addresses unmet need in multiple myeloma treatment decisions.
- ▶ Test can be used either at diagnosis or periodically during relapse treatment.

## Market Attractions

- ▶ Multiple myeloma cases are increasing with aging population.

## Contact

James Parrett  
[James.Parrett@ucdenver.edu](mailto:James.Parrett@ucdenver.edu)  
Ref# CU4553H

CU Innovations  
13001 E. 17th Place  
Suite W5130, Aurora, CO  
80045

t. 303-724-3720  
f. 303-724-0816

[innovations.ucdenver.edu](http://innovations.ucdenver.edu)

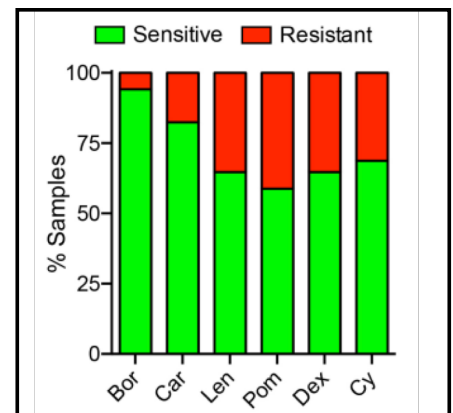
## Problem:

Multiple myeloma is a cancer that affects the plasma white blood cells, which are key components of the immune system. The exact cause of multiple myeloma is unknown and is incurable using conventional cancer treatment. Advances in anti-myeloma drug therapies over the last few decades have expanded treatment alternatives, significantly improved patient outcomes, and increased patient lifespan following initial diagnosis. Despite recent advancements that slow disease progression, nearly all multiple myeloma patients experience relapse. At that point, the tumor cells can develop resistance to specific drugs. To date, an effective clinical test to identify patient-specific drug resistances and inform clinical decision making during multiple myeloma treatment does not exist.

## Technical Solution and Key Value Propositions:

A team of University of Colorado researchers have developed a novel, personalized drug sensitivity assay to test whether a patient's myeloma tumor cells are resistant or sensitive to commonly used anti-myeloma drugs. To test drug sensitivity, mononuclear cells recovered from a patient's bone marrow are incubated with individual drugs or a drug cocktail. Next, the test quickly determines the degree to which tumor cells are sensitive or resistant to the drugs. Patient-specific information that is gathered from the assay can then be used by a physician to help guide a multiple myeloma treatment strategy.

Proof-of-concept studies using multiple myeloma samples from treatment naïve patients demonstrates that the test is capable of identifying patient-specific drug sensitivities and resistances (Fig. 1). In addition, the research team have shown that the drug sensitivity assay can be used at multiple points during treatment to periodically assess acquired drug resistances. Importantly, the test has potential to improve patient outcomes by quickly identifying anti-myeloma drugs that will have the most benefit and pinpointing those drugs that are likely ineffective and unnecessary.



**Fig. 1.** Multiple myeloma samples from treatment naïve patients were treated with commonly used anti-myeloma drugs and classified as sensitive or resistant to a specific drug.

## Key Documents and Sources:

US provisional patent application filed; available under NDA.

Forsberg PA, Hammes A, Abbott D, et al. Cellular proliferation by multiplex immunohistochemistry identifies aggressive disease behavior in relapsed multiple myeloma. *Leuk Lymphoma*. 2019;1-3.