# A Microfluidic Assay of Live Tissues for Personalized Medicine

**This technology utilizes a microfluidic perfusion device and tumor tissue from cancer patients to predict a drug response at the time of diagnosis. This approach will guide the individual care for patients.**

### What is the Problem?

Drug prediction in cancer patients is often inaccurate. This is due to the heterogeneity of tumors and the difficulty associated with re-constructing a model for a given tumor. Therapy choice is often guided by population-based averages that do not reflect differences between tumors or between patients with a specific type of tumor. One approach to address this issue is DNA sequencing for personalized chemotherapy. DNA sequencing is utilized to capture key genetic mutations and to identify the drugs that specifically target these mutations. This genetic approach, however, does not account for the tumor microenvironment. In addition, tumor slice cultures have been used as a model for drug prediction. Tumor slices, however, may only be produced from large tumors and only after surgical extraction.

### What is the Solution?

This invention provides a simple, predictive test of tumor chemosensitivity that is applied directly to tumor material or to any other tissue whose chemosensitivity or response to chemical, pharmacologic or biological perturbation needs to be assessed for diagnosis, therapeutic decision-making or as a guide to potential treatment-associated toxicity. This invention is based on a microfluidic platform that uses tumor material taken at the time of tissue sampling for histopathologic diagnosis. Tumor tissue in the form of a core biopsy or slice is placed in a laminar-flow microfluidic perfusion device. This is used to establish a histopathologic diagnosis for drug prediction, and permits a large number of drugs or reagents to be tested on the sample tissue core or slice.

### What Differentiates it from Solutions Available Today?

Population-based averages do not reflect differences between patients , and DNA sequencing does not account for the tumor microenvironment. Tumor slice cultures have been used as a model for drug prediction, but they can only be produced from large tumors after surgical extraction. The benefits and advantages of this invention is a more accurate prediction of drug responses and tumor chemosensitivity that can be applied directly to tumor biopsy material at the time of diagnosis. Thus, the apparatus and methods may help guide the choice of initial therapy in individual cancer patients.

### Technology ID

BDP 8677

### Category

Selection of Available Technologies

Diagnostic

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**Patent Information:**

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