

Mitra Biotech
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CANscript: clinically validated oncology drug efficacy platform

Mitra Biotech is advancing CANscript, a fully human, clinically validated, ex vivo platform for oncology drug programs. Mitra is looking to expand its broad network of pharma and biotech collaborators to further advance promising oncology candidates to and through the clinic.

Mitra Biotech, a global leader in phenotypic testing, is headquartered in Greater Boston, with substantial research and clinical laboratories in both Woburn, Massachusetts, and Bengaluru, India. The company's CANscript platform recreates a patient's own tumor microenvironment (TME) ex vivo, effectively generating a personalized phenotypic assay platform to measure multiple parameters and determine a tumor's response to selected treatments. The measurements are converted into a single score, known as 'M-Score', that predicts a patient's clinical response to the tested therapies at a clinically validated level of up to 90%.

CANscript provides biopharma companies with a unique platform to rapidly advance programs into and through the clinic by providing data on the most responsive tumor types and effective drug combinations and to interrogate mechanisms of resistance to drive rational combinations. In addition, CANscript streamlines biomarker identification to optimize patient stratification for clinical trials.

Since its commercial launch in 2017, more than half of the top 25 oncology companies worldwide, and a growing number of emerging biotechs, have adopted CANscript to accelerate the progress of their drug development programs. Mitra is seeking to expand its range of partnerships to further increase the impact of its platform on patient outcomes.

According to Pradip Majumder, CSO of Mitra, "engaging tumor targets is critical in developing anticancer molecules, but it is more important to know whether the target engagement is reflective of tumor efficacy in the clinic. Mitra's fully humanized, clinically validated platform gives researchers this critical information together with a wide range of mechanistic insights."

CANscript: the basics

Robust, clinically relevant models are highly sought after by oncology drug developers seeking to accurately predict the efficacy of drug candidates and elucidate mechanisms of action.

Mitra's CANscript uniquely provides a tumor model platform that preserves the native-state proliferation, morphology and viability of tumor cells within the context of the original TME. The platform consists of an ex vivo patient tumor culture model that uses intact tumor slices cultured with autologous plasma and autologous peripheral blood mononuclear cells. By maintaining the complex structure, heterogeneity and behavior of tumors in culture, CANscript can be used to predict the response of individual patient tumors to monotherapies and combination therapies of many classes of drugs with high accuracy.

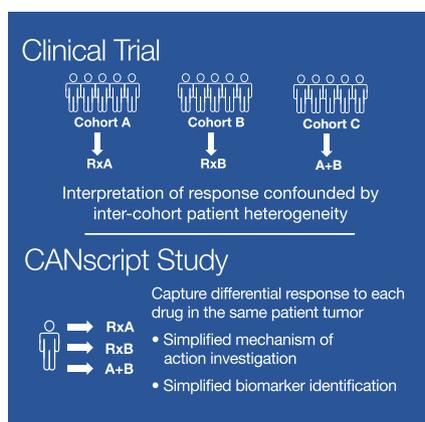


Fig. 1 | Personalized cancer drug development support. The CANscript platform supports cancer drug screening in the native tumor environment ex vivo and utilizes multiple terminal and kinetic assays to predict clinical outcomes and help prioritize treatment strategies.

CANscript monitors a number of phenotypic readouts, both terminal and kinetic, including tumor cell proliferation, cell death, viability and tumor morphology. Data are analyzed using proprietary machine-learning algorithms that connect ex vivo data with clinical outcomes. Biopharma partners use these insights to quantitate drug response and allow clinical efficacy prediction with up to 90% accuracy¹.

Biopharma companies use CANscript as a surrogate for clinical studies, advancing programs by determining the relative efficacy of single drugs and drug combinations, as well as potential mechanisms of action. In a recent publication, Mitra researchers demonstrated the potential of the platform to drive the development of rational combination strategies by showing how Cetuximab resistance in patients with metastatic colorectal carcinoma could be overcome using a combination of an ErbB2 inhibitor and a Notch inhibitor².

The CANscript opportunity

Mitra works closely with biopharma partners on implementing CANscript, from project development through to study execution. The platform affords many drug development and discovery applications.

- Optimal combination therapies: CANscript's prediction outcome system provides a standardized approach to the prioritization of the combinatorial strategies tested.

- Mechanism of action: CANscript's integrated phenotypic outcome and subsequent omic data can shed light on the potential mechanisms of action that underlie a response of interest.
- Drug impact: CANscript's preservation of the TME, including the tumor immune compartment, can help hone immunomodulatory strategies.
- Biomarker discovery: CANscript's predictive power can be leveraged to identify biomarkers that distinguish populations of responders from non-responders.
- Indication prioritization: CANscript's prioritization algorithms can be used to determine which tumor types will be best addressed by a lead candidate.
- Parallel clinical trial: CANscript's flexible platform can be harnessed to rapidly assess differential response and resistance profiles within a patient population.

Mitra is committed to growing its existing network of drug development partnerships with top oncology-focused pharma and biotech companies. CANscript has already contributed to the prediction of drug efficacies subsequently corroborated in clinical studies in two separate drug development programs.

CANscript also has tremendous clinical potential to inform and improve patient care. For that reason, Mitra is committed to continuing its efforts to expand the clinical evidence that supports the platform's predictive performance and clinical impact. This is currently being demonstrated in a multinational prospective study in which CANscript will be used to inform the care of 1,600 patients with five solid tumor types.

"With CANscript, Mitra can deliver the insights needed to confidently advance oncology programs by better understanding efficacy, mechanism of action and biomarker patterns in a fraction of the time and cost of clinical studies" said Andrea Jackson, VP of Biopharma at Mitra.

1. Majumder, B. et al. *Nat. Commun.* **6**, 6169 (2015).

2. Brijwani, N. et al. *Sci. Rep.* **7**, 1502 (2017).

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