PREDICTIVE ONCOLOGY®

Predictive Oncology

(NASDAQ: POAI)

PeDAL PLATFORM OVERVIEW March 2022

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Executive summary

- There is extensive variation among patients in their response to drugs
- The cost and time required to screen drugs against 100's of patient samples are high
- PeDAL provides an artificial intelligence (AI) machine learning platform to drive experimental testing (coupled with tumor assay capabilities) to evaluate 100's of diverse tumor samples against 100's of drug compounds early in drug discovery
- PeDAL's AI component iteratively selects pairs of drug/tumor samples to test *in vitro*
- PeDAL can make high-confidence predictions of drug response **enabling a more informed selection of drug/tumor type combinations to increase the probability of success during development**
- PeDAL provides an opportunity to **repurpose drugs** through new evaluation in additional tumor types

PeDAL's applicability in drug discovery

- Insight into other proteins in target pathway that can be druggable

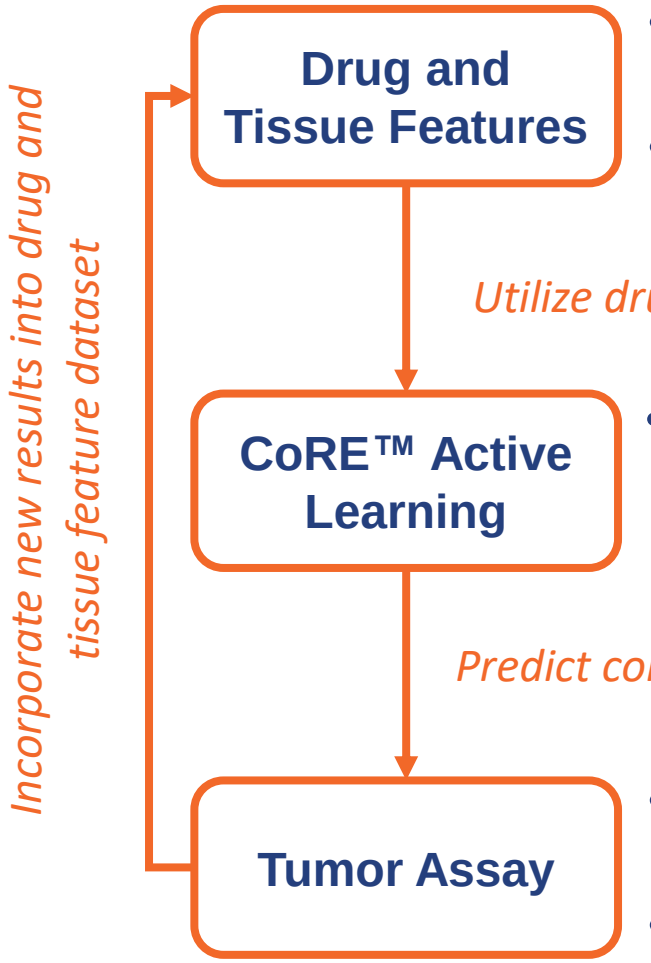
- In silico screen 100's of compounds against various tumor types
- Combination therapy screen

- Experimental validation of promising candidates in cell-based assays
- Supplement in vitro and in vivo testing

- In silico modeling of optimized molecules and experimental validation
- Toxicology (in normal tissue)
- Lead optimization in silico

PeDAL is designed to facilitate the selection of drug candidates with a higher probability of success for clinical development

PeDAL – Patient centric Discovery by Active Learning



- Proprietary knowledgebase from 15+ years of real-world longitudinal clinical data (150,000+ patients historical drug response and/or other relevant data)
- Flexibility to use POAI's data along with customer-provided, and/or public datasets of drug and tissue features

Utilize drug and tissue feature data set to iteratively improve the predictive models

- Active learning for constructing predictive models of all possible combinations of patient-specific drug response and using these models to efficiently drive rounds of "wet-lab" drug-response testing

Predict compounds and tissue samples that would be the most informative to test

- Customizable tumor assay design leveraging 1,000's of well characterized primary patient tumor cells
- Clinically validated, translatable assays

CoRE: Computational Research Engine

- Predictive Oncology has an exclusive license to CoRE from Carnegie Mellon University
- CoRE is a comprehensive in silico platform that iteratively optimizes predictive models using guided selection of experiments
- CoRE employs a polypharmacological/pharmacogenomic approach which builds a large set of predictive models and selects the optimal pairing of data and algorithm using a comprehensive machine learning methodology
- The CoRE Portal is the graphical front to the CoRE system which provides a number of displays and reports to allow visualization of the progress of PeDAL campaigns

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Customizable tumor tissue and assay design

- Cell-bank of 1,000's of diverse, **well-characterized tumor samples.** Flexibility to use POAI's along with customer-provided samples
- Maintains **cell-to-cell** contact per the original patient tumor sample, allowing for **tumor-stromal** interactions within the tumor explant culture. Tumor microenvironment may be studied
- **Cellular heterogeneity** is maintained in our standard assays, providing an advantage over immortalized cell-lines
- Performed in a highly regulated **CLIA** lab. Testing process is **automated** to maximize data quality efficiency
- Platform is **flexible** to suit a researchers needs. Various biochemical parameters can be studied, and the system is adaptable to different conditions

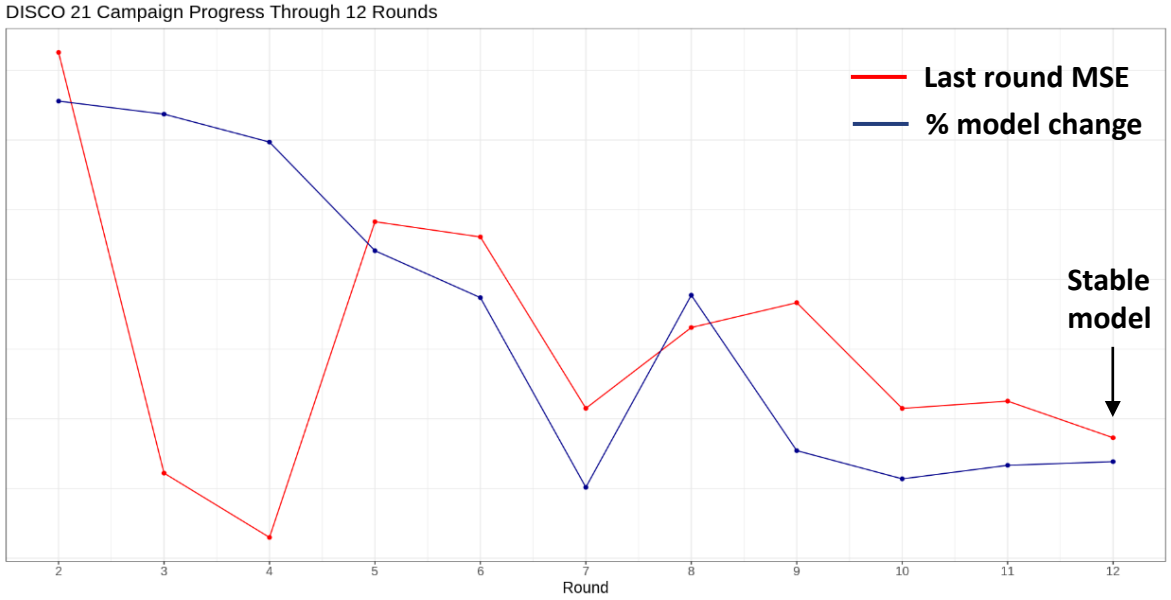
PeDAL proof-of-concept: Discovery 21

- The experimental space: 175 FDA-approved cancer drugs and 130 patient ovarian tumor samples
- Discovery 21 utilized extensive chemical structure features and historical drug response data for the patient tumors along with other relevant data on tumor samples, focusing on discovering which drugs inhibit growth of which tumors

The focus of active learning-driven experiments is to iteratively improve a predictive model until it reaches a specific desired goal or no longer changes significantly between rounds

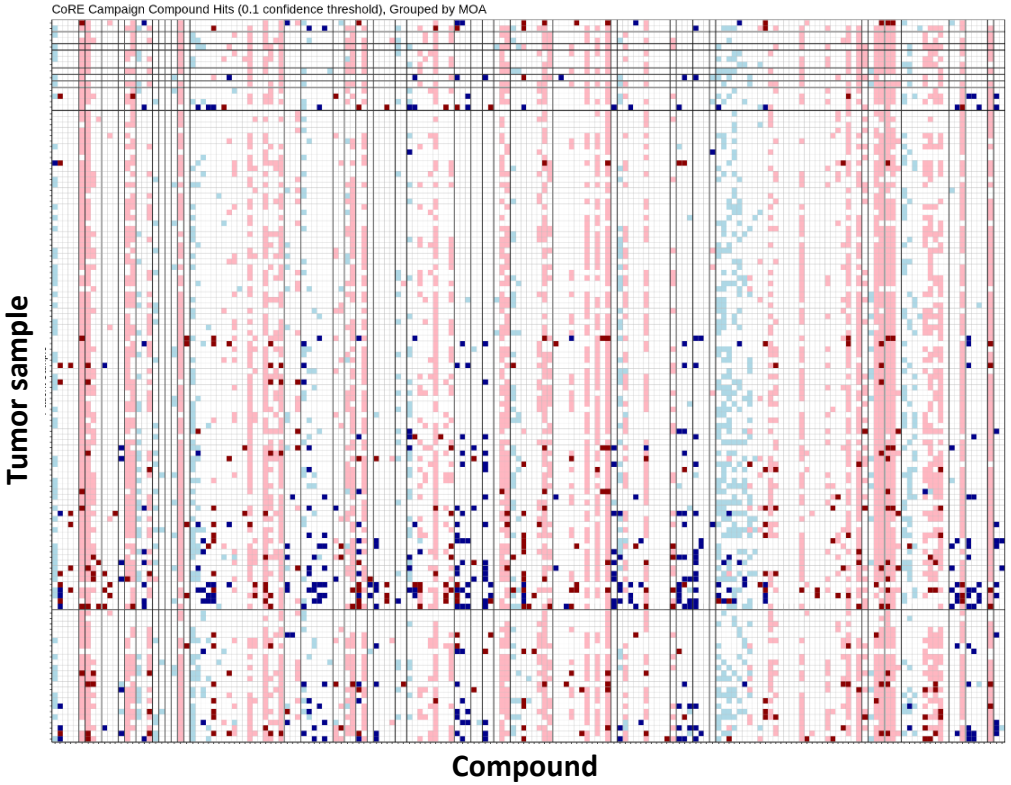
- Discovery 21 ended after 12 rounds of iterative experimentation chosen by CoRE
- In total, 3.16% of the experimental space was explored via “wet-lab” testing

Discovery 21: stable predictive model



Discovery 21 was designed to stop based on "% model change" metrics. When the relative model has reached the pre-determined stability goal the campaign is considered complete and reaches its stopping point.

Discovery 21 **completed after 12 rounds** on pre-determined criteria.

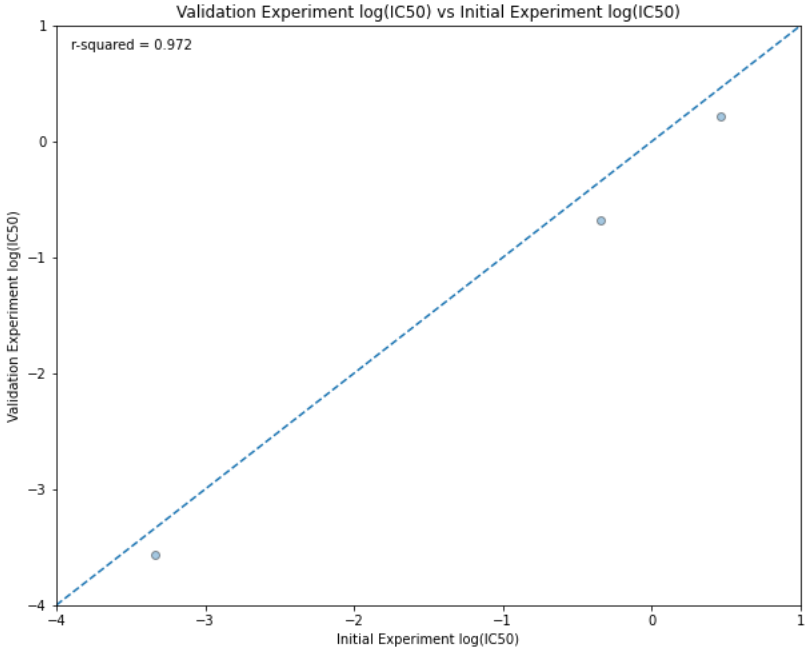


In Discovery 21, PeDAL, completed wet-lab experiments for 3.16% (dark color squares) of the experimental space and made **high-confidence predictions for additional 20.47%** (light color squares) **of the possible combinations**.

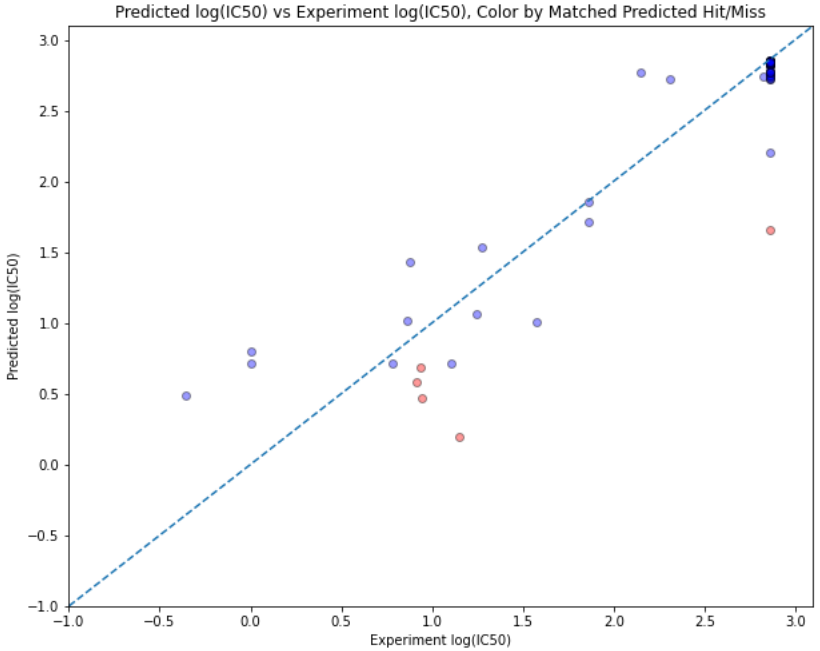
*Mean Square Error (MSE)

Discovery 21: validation

Upon completion of the campaign, a validation round was executed to evaluate wet-lab experimental reproducibility and the accuracy of the high-confidence predictions generated by PeDAL



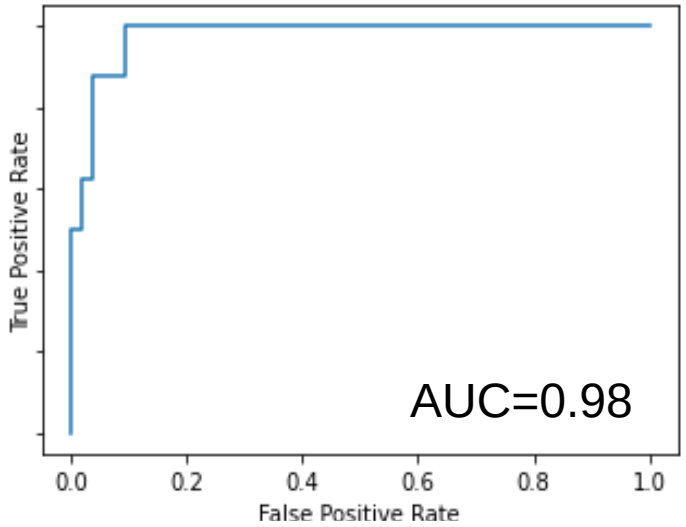
Validation results for wet-lab testing matched the wet-lab results in the first 12 rounds with high confidence (R^2 = 0.97).



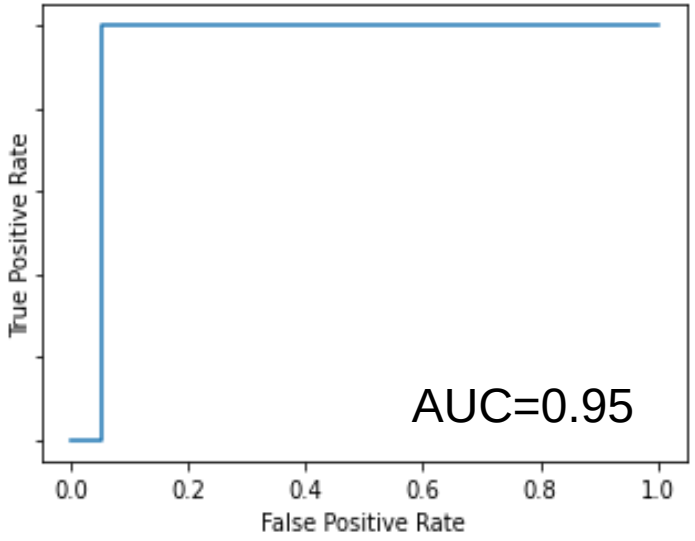
PeDAL predicted IC50 with strong agreement to the IC50 measured in the validation round (R^2 = 0.86). It also predicted whether a compound would be a hit or a miss with 92% accuracy.

Discovery 21: validation (continued)

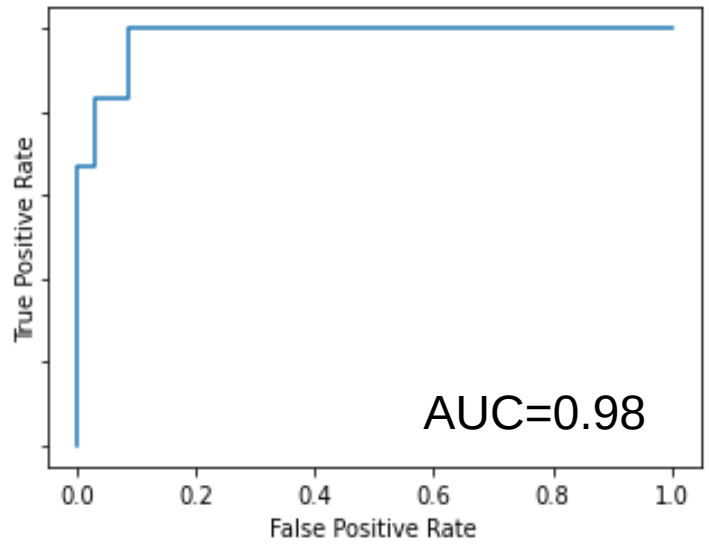
(a) All validation samples



(b) Validation samples measured in first 12 rounds



(c) Validation samples not previously measured



CoRE has a high discriminatory power to predict hits/misses (a), and CoRE learned to make high accuracy predictions even for cell lines that did not have wet-lab data in the first 12 rounds (c). Using a hit threshold 1 log below maximum treatment concentration, the AUC is 0.98 in both scenarios.

*Area-Under-the Curve (AUC)

Ongoing research collaboration with UPMC

Ongoing project with Magee Women's Hospital at UPMC to build and validate a model of ovarian cancer patient outcomes utilizing:

- Existing drug response profiles of ~400 patients tested by POAI
- Whole genome and whole transcriptome sequencing data
- 10+ years of clinical data and patient outcomes

Potential uses of the model include:

- Clinical decision support
- How best to manage: (1) hyper-responders, (2) hyper-non responders, and (3)"Chronic" recurrence

The Magee project is expected to be complete in Q3 2022

PeDAL: partnering to speed drug discovery

- PeDAL leverages incomplete data and efficiently picks the best new data it needs to make a high-confidence prediction
- Design of PeDAL campaigns are completely customizable
- Predictive Oncology owns the world's largest patient tumor drug response and genomic knowledge base gained from testing of 150K+ clinical cases covering 137 tumor types in our unique, clinically-validated drug-response testing platform

PeDAL can: (1) reduce the timeframe and increase the agility of the drug discovery process, (2) increase the likelihood of drug efficacy by efficiently addressing tumor heterogeneity, and (3) improve the diversity of the drug portfolio against a given cancer.

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Questions and request for additional information

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