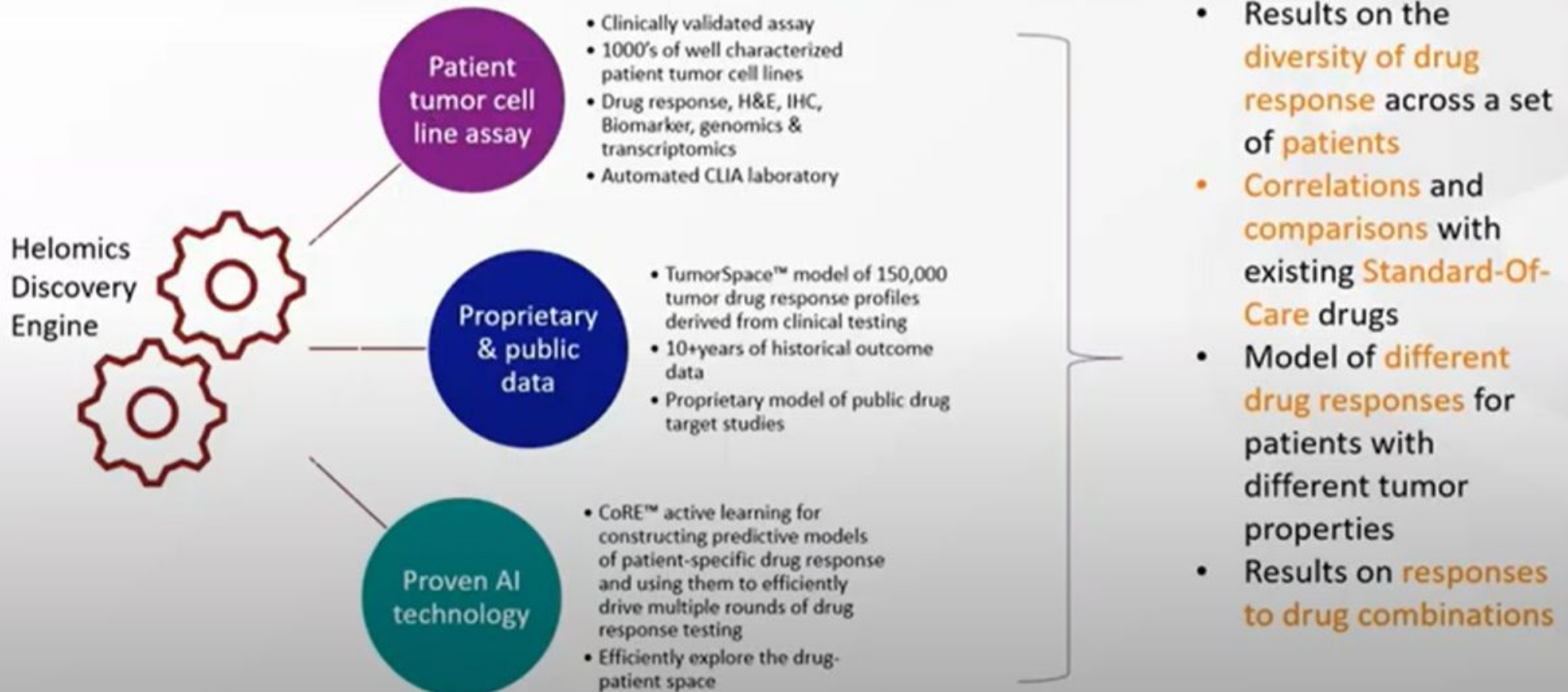
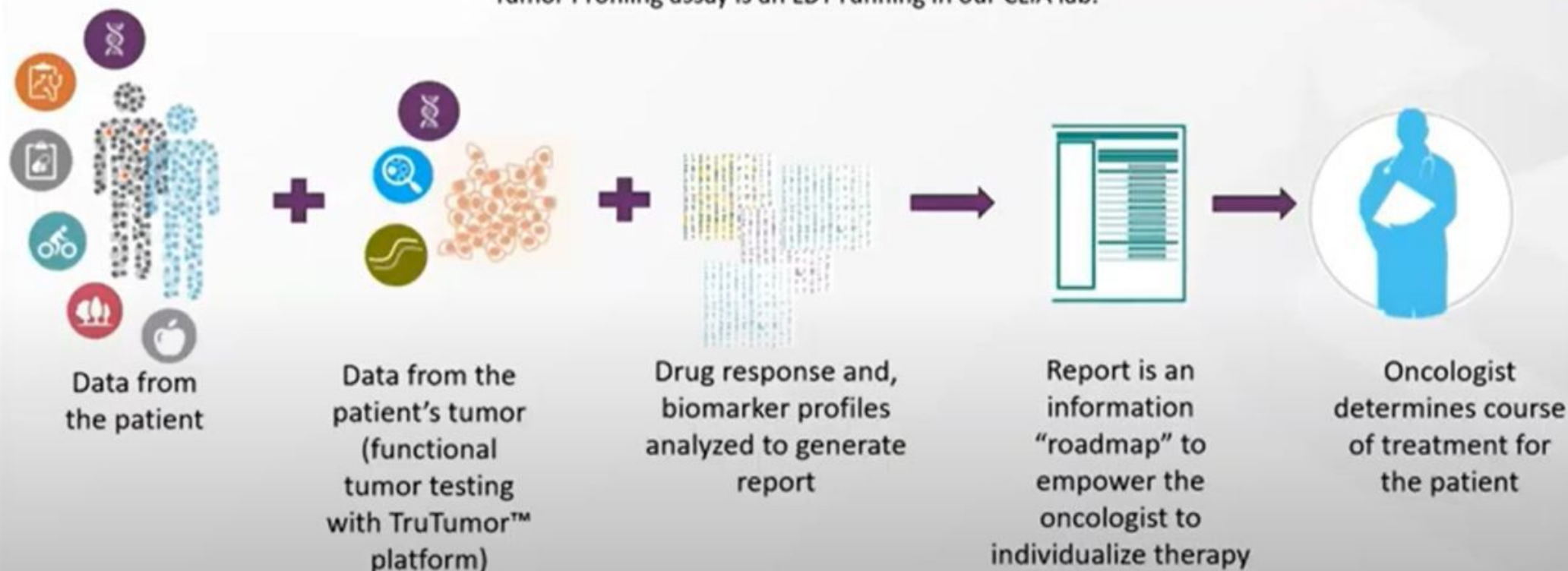


Helomics-Patient Centric Discovery Engine



Helomics Clinically Validated* Functional Tumor Profile Test

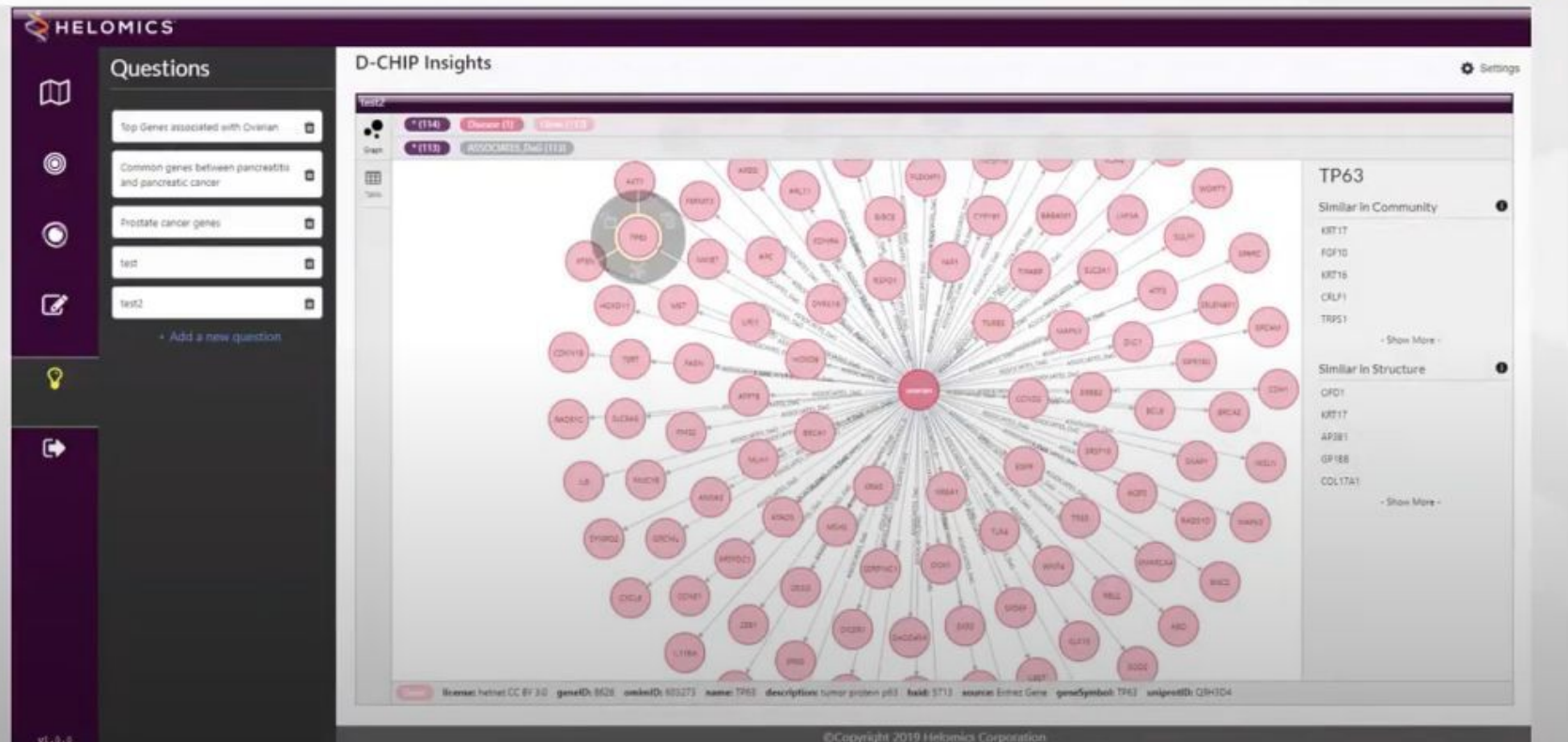
Tumor Profiling assay is an LDT running in our CLIA lab.



Data to drive featurizers

Data (TumorSpace graph db)

- 4.5M cell images from 137 tumor types
- Multiple growth metrics (AUC7, EC50, IC50, GR50, GI50)
- Biomarker data
- WES and WTS

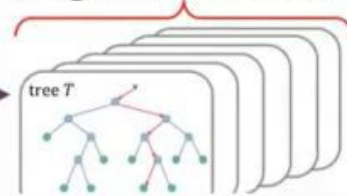


Building regression models

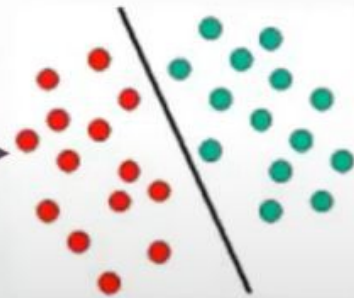
Number of cells
Number of relationships
Avg cell diameter
Avg cell entropy
Avg cell max intensity
Avg cell mean intensity
Avg cell min intensity
Avg cell perimeter
Avg cell area
Avg cell skew
Avg cell kurtosis
Avg cell circularity
Avg cell degree
Avg neighbor distance
Stdev cell diameter
Stdev cell entropy
Stdev cell max intensity
Stdev cell mean intensity
Stdev cell min intensity
Stdev cell perimeter
Stdev cell area
Stdev cell skew
Stdev cell kurtosis
Stdev cell circularity
Isolated points ratio
End points ratio
Number of components
Giant components ratio

Haralick texture
features

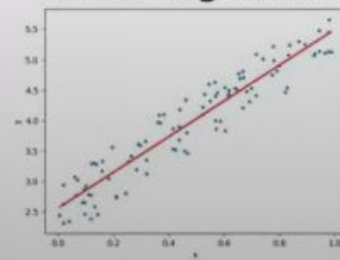
Weighted Random Forest



Support vector machine



Linear-regression



Evaluate best model
(RMS Error)

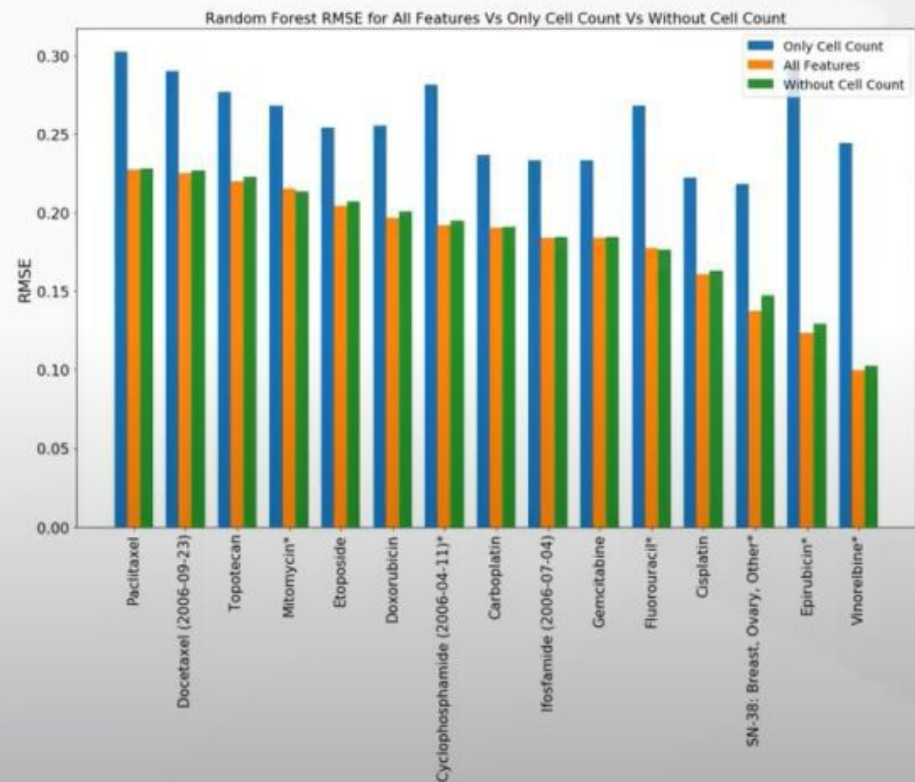
Random Forest Model

Validate model

Use the results to demonstrate that the model
(Featurizer) is sufficiently complex to represent tumor
drug response

Training a Random Forest Classifier

- Do all the extra cell imaging features help in building models?
 - 'all features'
 - 'all features except cell count'
 - 'only cell count'
- 'all features' and 'all features except cell count' outperformed only cell count



Summary – cell imaging ML Featurizer



- Based on multiple features
 - 431 Texture features
 - 99 Cell-Graph features
- Model based on a Random Forest Classifiers performed best at predicting response (AUC7)
- Featurization of cell images builds good models of patient tumor cell drug response
- Featurizer based on cell images can be used for our overall multi-omic approach