Darwin (Bio + AI)

The Onco Semantics R&D Lab on a mission to decode Cancer's language and enable Humans to develop High-precision Drugs!

DARWIN
(BIO + AI)

Thank you for dropping by

To make our research at Darwin (Bio + AI) accessible and easy to understand, we have put together a high-level document outlining how we are addressing the grand challenges in oncology and our progress so far.

DRUG RESISTANCE

Drug resistance remains a formidable challenge in cancer treatment with a range of implications, such as;

Variable Efficacy

Drugs exhibit varying levels of efficacy across patient populations, resulting in unexpected side effects and inconsistent treatment outcomes

Insufficient Target Validation

Limited understanding of carcinogenesis and drug resistance leads to inadequate target validation, reducing the therapeutic efficacy of novel targeted drugs

Increased Economic Burden

The complexity of developing targeted cancer drugs, combined with traditional drug discovery challenges, increases the R&D and cancer treatment burden

ONCOGALACTICA

To investigate the molecular causes of Drug Resistance in solid tumour conditions, Darwin (Bio + AI) has actively been developing OncoGalactica, its flagship AI Onco Semantic framework to;

Integrate Multi-Dimensional

Molecular Oncology and Clinical Oncology data with AI semantics

Decipher Causal Relationships

between genes and downstream receptor and signalling proteins

Reconstruct the unique Molecular Aetiology

of individual patients

Identify key Molecular Mechanisms

driving carcinogenesis and drug resistance in solid tumour conditions with patient-level granularity

USECASES

Drug Discovery

1. Patient Stratification

For Stratification of patient population with similar molecular aetiology profiles

2. Target Validation

Enhanced Target Validation of novel targeted drugs with reduced off-target effects and improved therapeutic effectiveness

3. Novel Therapeutic Modalities

To identify novel therapeutic applications for existing targeted drugs

NOTE:

1. OncoGalactica’s application in drug discovery is still an evolving area and is yet to be validated.

USECASES

Precision Oncology

1. Experimental Investigations

To investigate the molecular factors and mechanisms driving drug resistance in individual cancer patients

2. Alternative Therapeutics

To identify last-resort treatments for metastatic cancer patients when standard therapies have failed to provide effective therapeutic benefits

NOTE:

1. OncoGalactica framework is strictly recommended for use when standard clinical techniques fail to provide sufficient clinical insights.
2. It is recommended for cases where solid tumours have developed resistance to first- and second-line treatments, requiring experimental approaches for effective treatment.

TRIALS

Validation Trial Results

In a multi-centre, single-blinded, non-randomised trial involving 22 metastatic HER2-positive breast cancer patients with similar molecular aetiology profiles who had developed resistance to trastuzumab and taxane therapy, 11 patients in the treatment group were treated with an OncoGalactica-recommended combination of Pertuzumab and Alpelisib.

72.7%
Overall Response Rate (ORR)
(8 patients with tumor shrinkage)

90.9%
Clinical Benefit Rate (CBR)
(8 patients with tumor shrinkage and 2 with halted disease progression)

90.9%
Progression-Free Survival (PFS)
(10 patients at 4 months)

00.0%
Drug-related Toxicities
(No new drug-related toxicities reported)

NOTE:
1. The combination of Pertuzumab and Alpelisib is an off-label therapeutic recommendation, identified to match the molecular profiles of patients in the treatment group using OncoGalactica-enabled molecular aetiology profiling.
2. The trial was conducted as part of the validation process to confirm the accuracy of OncoGalactica on real-world patients in a controlled clinical environment.

OBSERVATION

The results obtained from the validation trials suggest that the OncoGalactica framework;

1

Accuracy

Accurately identifies the molecular factors driving drug resistance and carcinogenesis with patient-level granulatity

2

Precision Oncology

Can be applied in experimental medicine to drive clinical R&D within hospitals

3

Drug Discovery

Can be used in drug discovery and clinical trials to test novel targeted drugs with enhanced target validation across stratified patient populations

DARWIN (BIO + AI)

Darwin (Bio + AI) was founded by

Vamsi AR,

a Computational Biologist trained at the University of Nottingham and various NHS hospitals, with expertise in Cancer Genomics, and AI. He previously developed OncoNLP, an AI tool for bio data annotation, which was later acquired by a **Fortune 200** Consulting Company for its broad applications in AI-driven oncology R&D.

Scientific Philosophy

Vamsi advocates for non-linear scientific approaches to address cancer's complexity and to make cancer research and care more efficient and affordable. It is with this vision and conviction that he founded Darwin (Bio + AI).

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REACH OUT

If you’d like to discuss about our research or collaborate with us, please write us to **contact@darwinbio.ai**

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