



**HYRAX BIOSCIENCES**

**Bringing scientific innovation  
from academia to business: our  
journey, lessons learned and  
other stories.**

# Motivated by inequity

HIV



**7.1 million HIV+ individuals**

# Motivated by inequity

HIV



**7.1 million HIV+ individuals**

**~55% receiving treatment**

# Motivated by inequity

HIV



>20% of individuals may be resistant to one or more first line drugs even before they start treatment.

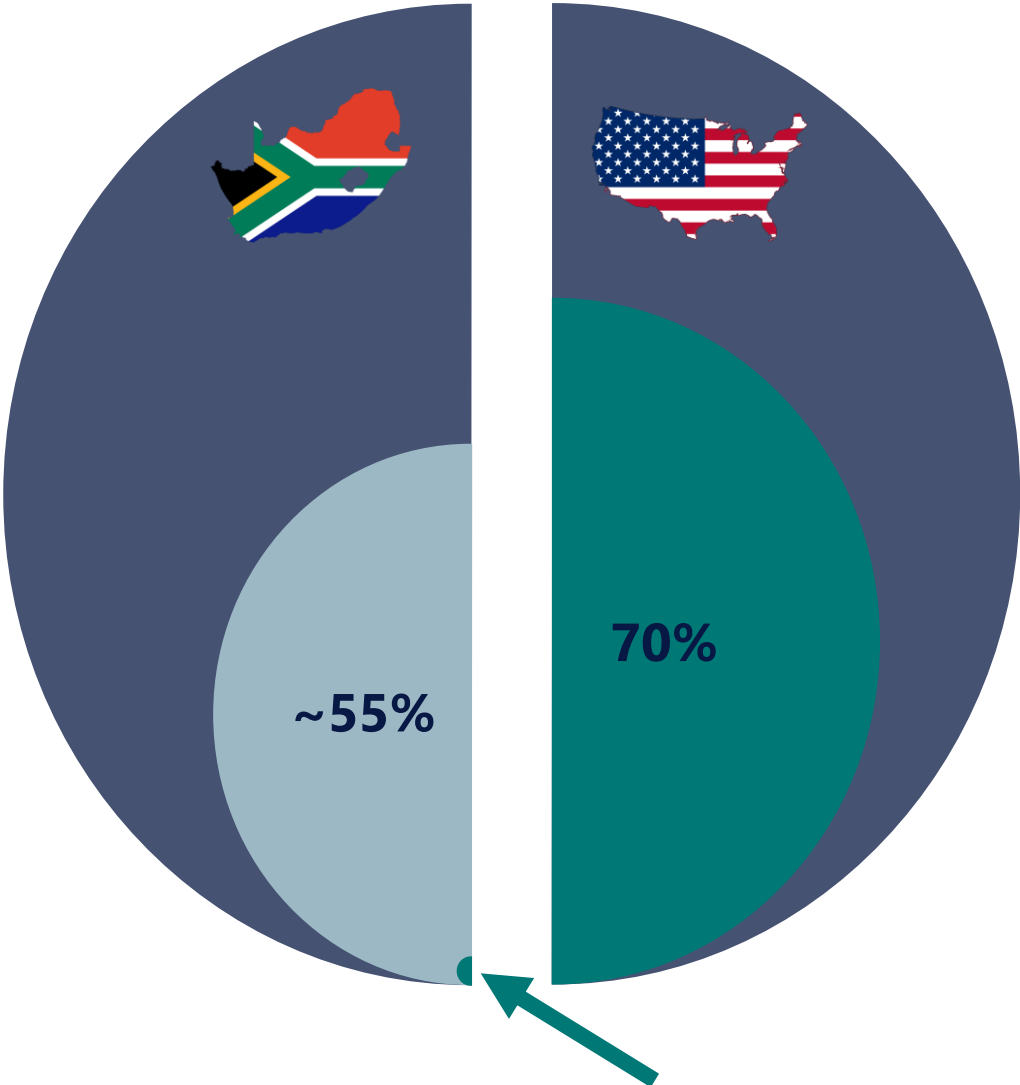
Drug resistance testing reduces treatment failure.

~55%

70%

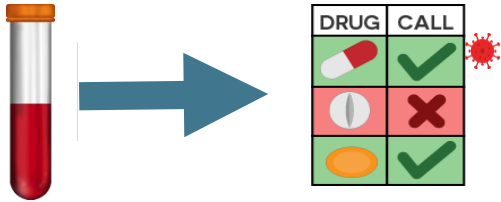
# Motivated by inequity

HIV



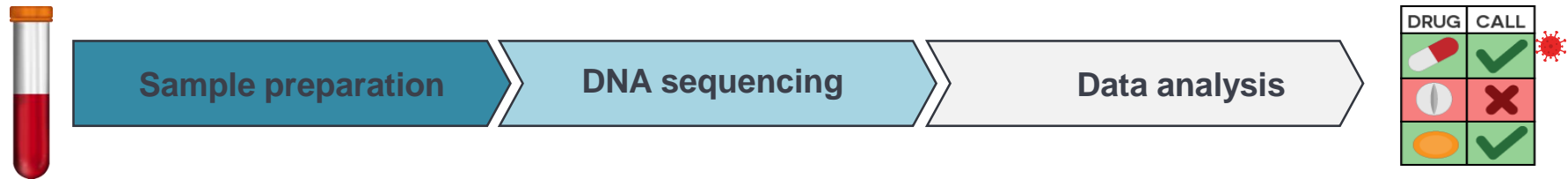
# Detecting drug resistance

DNA sequencing used to detect drug resistance



# Detecting drug resistance

DNA sequencing used to detect drug resistance



Next-generation sequencing enables

- High-throughput.
- Increased sensitivity.



***BUT!***

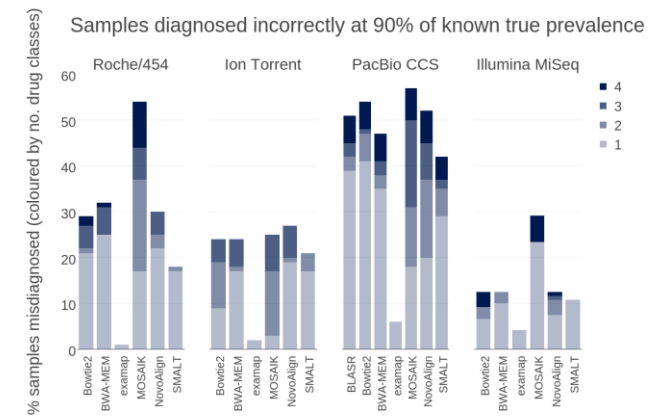
Data is complex, noisy and error prone.

Very difficult to analyse at scale.

How can we remove barriers from DNA  
sequence analysis to enable **anyone** to  
transform raw sequence data into actionable  
results?



Scientific accuracy is  
our number 1 priority.



Our algorithms show **99% accuracy** for HIV drug resistance testing compared with as little as 60% accuracy in other solutions.

# Enable global access

HICs vs LMICs

Availability of expertise.

Manual process

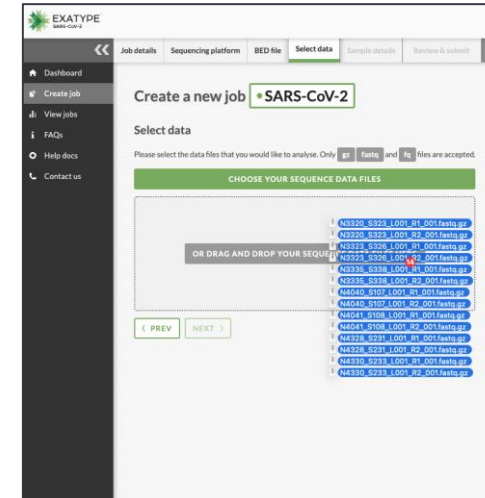


# Enable global access

## HICs vs LMICs

Availability of expertise.

Drag and drop!



Cloud integration  
with sequencing  
machine via APIs



# Enable global access

HICs vs LMICs

Computational resources.



# Enable global access

HICs vs LMICs

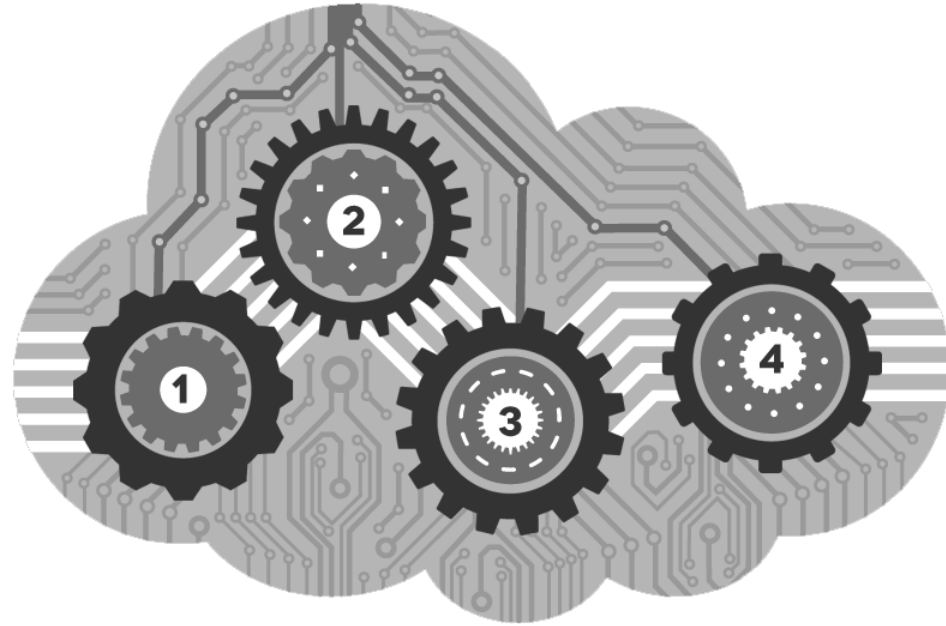
Price sensitivity and complexities.

Addressed through the business model e.g.

- Tiered pricing.
- Bundling: full sample -> report solution.

All of the problems we solved for  
HIV are applicable to a wide-variety  
of applications.

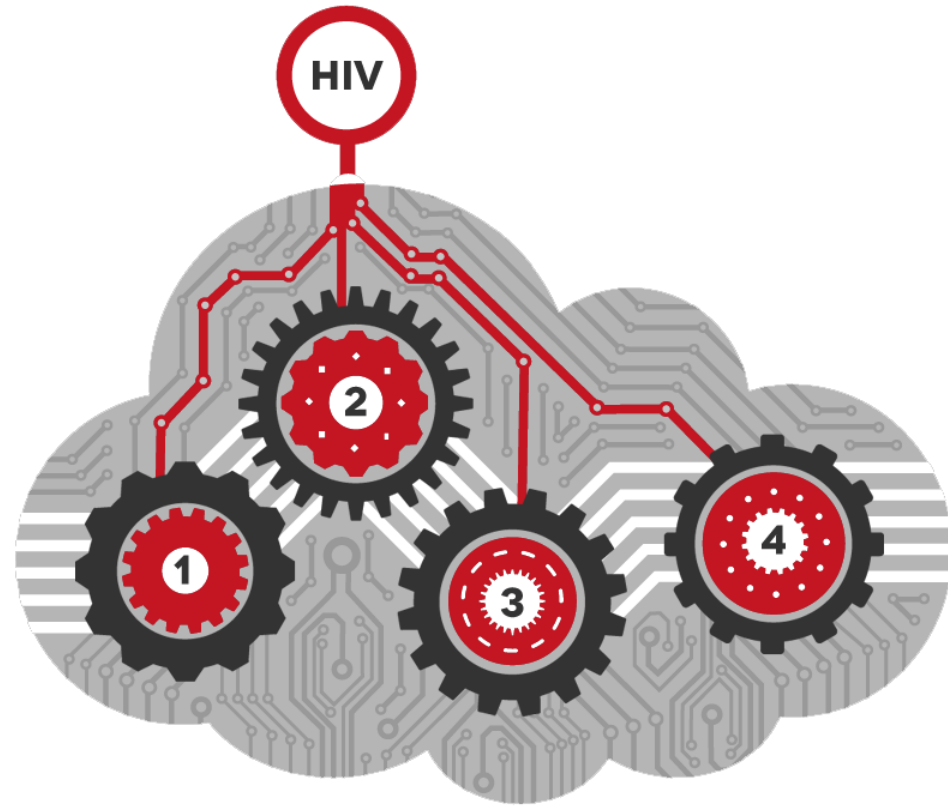
# Exatype: A disease agnostic software platform

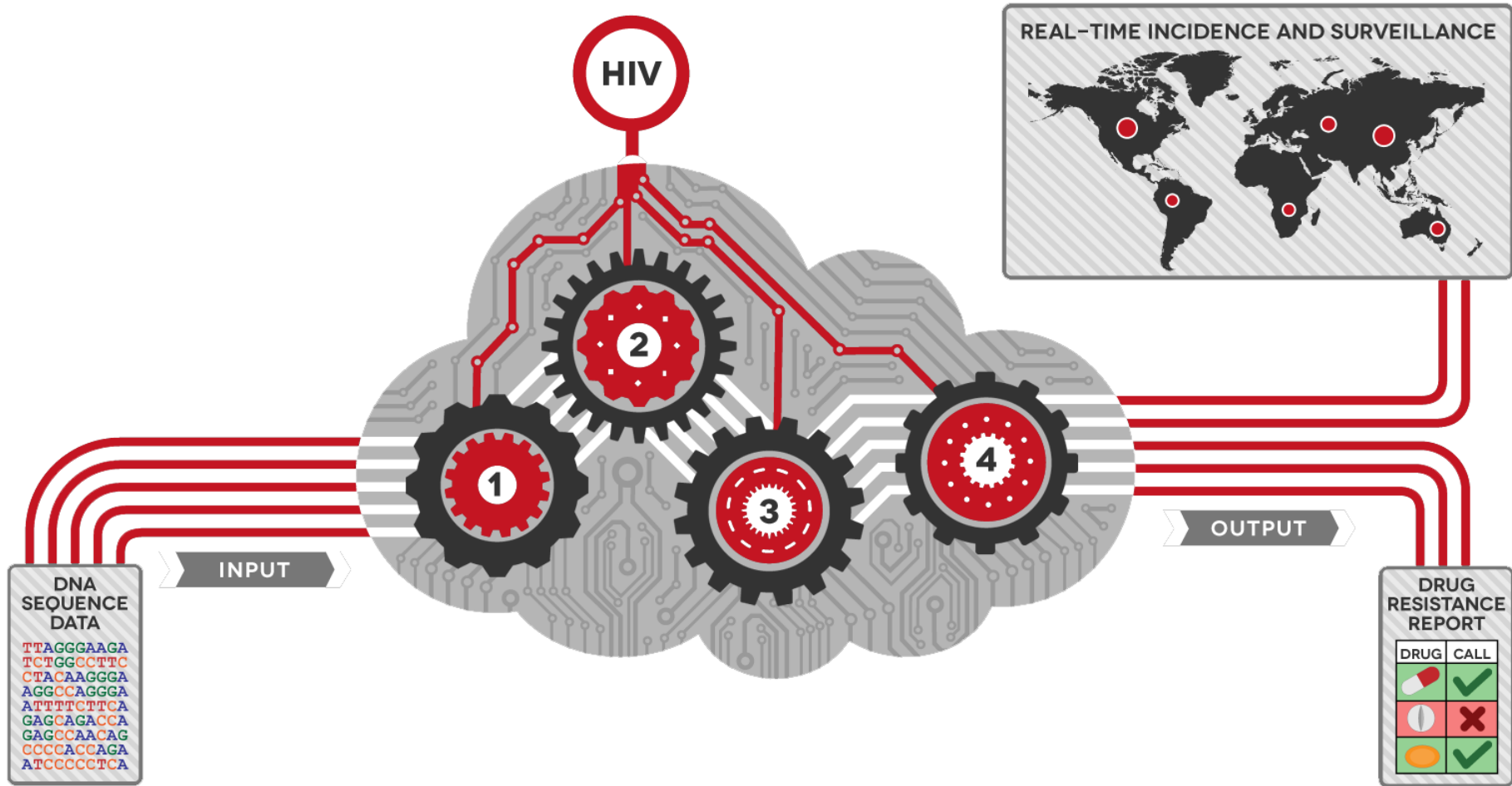


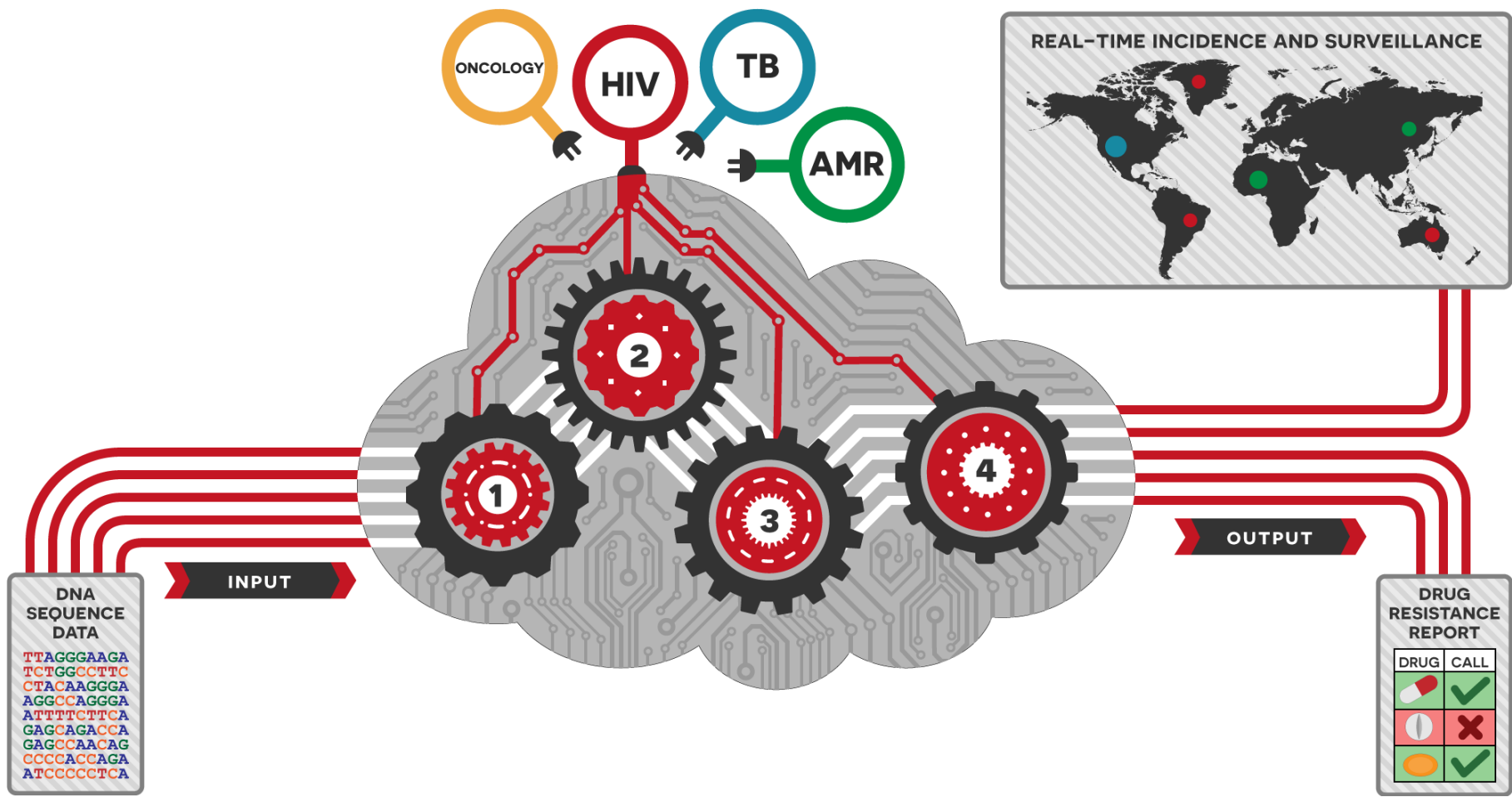


**Unique “plugs” harness the power of the platform for a specific application.**









# Academia -> Business

*This research could be used for...*

# Academia -> Business

## Remain in academia

Sustainability (grants?)

Competition with academic focus  
(papers/funding/students) .

Are University environments appropriate  
for scaling products?

## License IP

What is our IP?!

Continued development needed.

## Setup Company

Priorities aligned towards sustainability  
through to commercial growth.

Focused, continued development of the  
product.

True scale achieved with a commercial  
product in a commercial environment.

# Growth and traction

**EXATYPE HIV DRUG RESISTANCE REPORT**

Name: 548\_L001 (Detailed result) Analysis date: 2023-08-30 13:13  
 Product: HIV WGS Sample status: Completed  
 Sequencing platform: Illumina Exatype version: 0.9.2.17  
 Data structure: Paired-end Resistance algorithm: Standard HIVDB v9.5.0  
 Assay: Generic  
 DRM prevalence cutoff: 15%

● Susceptible ● Potential low-level resistance ● Low-level resistance  
● Intermediate resistance ● High-level resistance ■ Low coverage

DRUG CLASS	DRUG	CALL <sup>1</sup>	DRMS ≥ 15% PREVALENCE
PI	ATV/r	S	
	DRV/r	S	
	FPV/r	S	
	DDV/r	S	
	LPV/r	S	
	NEV	S	
	QDV/r	S	
	TPV/r	S	
	FTC	S	
	ABC	S	
NRTI	AZT	I	
	DAT	I	
	DDI	S/L	[RT] M41L, [RT] T215E
	FTC	S	
NNRTI	DOV	P/L/L	
	EFV	S	
	ETR	P/L/L	[RT] V106I, [RT] N248I
	RPV	S/L	
	RPV	P/L/L	
INSTI	BIC	LC	
	CAB	LC	
	DTG	LC	
	EVG	LC	
	RAL	LC	

## HIV drug resistance

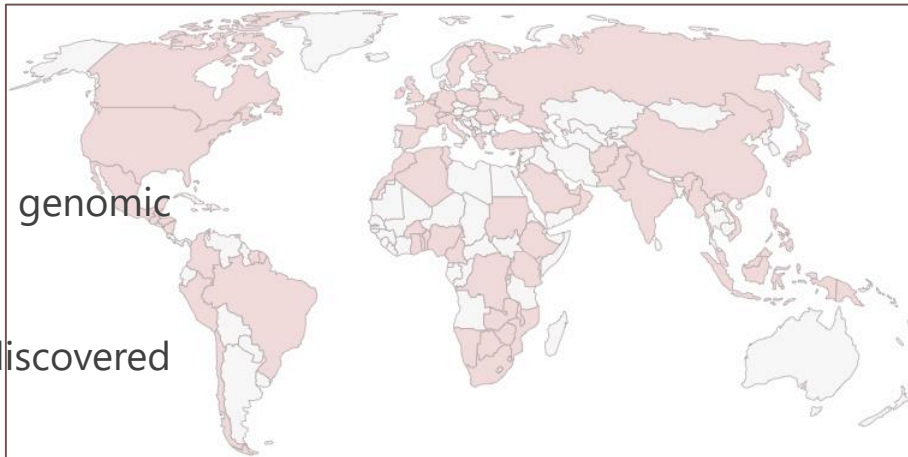
(Sanger/CE sequencing)

Partnership with **Thermo Fisher Scientific**.

## HIV drug resistance

(NGS, both RNA & DNA)

Used at scale by **Quest Diagnostics** for proviral HIVDR.



## SARS-CoV-2

(NGS)

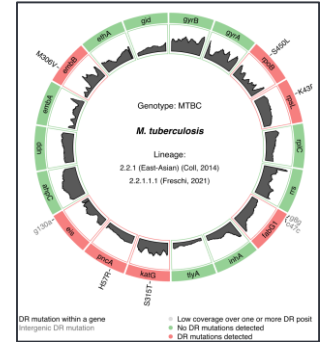
Used globally for genomic surveillance;

**Omicron variant** discovered using Exatype.

## TB drug susceptibility testing

(NGS)

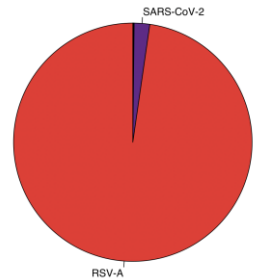
Supports a number of partner assays and detects resistance to all available TB drugs.



## Targeted Sequencing panels

(NGS)

Detection and characterisation of **10s to 1,000s of targets**.



## Custom Companion Software

(NGS):

Deployed as **companion software** supporting data analysis from partner assay.

# Challenges and Learnings



**Business model.**

**Funding.**

**Regulatory.**





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**Thank you!**