

INTUITIVE INFORMATICS

NEXT-GENERATION-SEQUENCING DATA ANALYSIS FOR
IDENTIFICATION OF INFECTIOUS DISEASE

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UNMET MEDICAL NEEDS

- 15 million people die from infectious disease per annum
- ~ 700 000 die every year from antibiotic resistant bacteria
- WHO and CDC state antimicrobial resistance is one of our most serious health threats
- The time it takes to retrieve the data necessary for a patient to be diagnosed for infections is often too long
- The precision of the diagnosis of infectious disease is often too inaccurate

MISSION

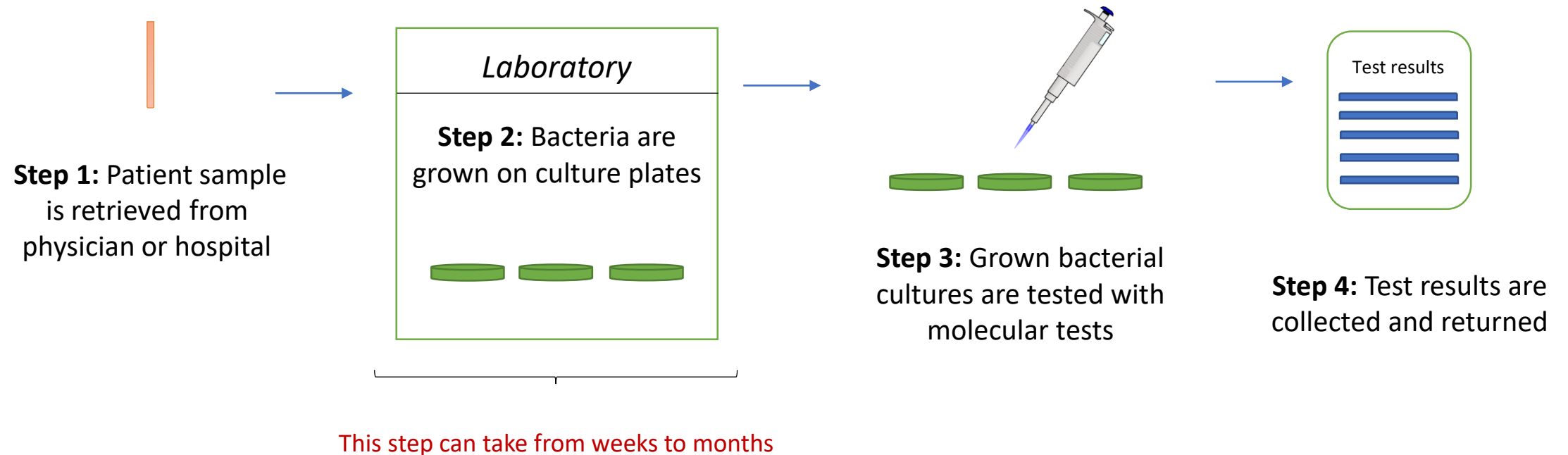
The strategy is to

Apply machine learning, classical bioinformatics and statistical methods to interpret Next-Generation-Sequencing (NGS) data for the identification of bacterial species and resistance type when present

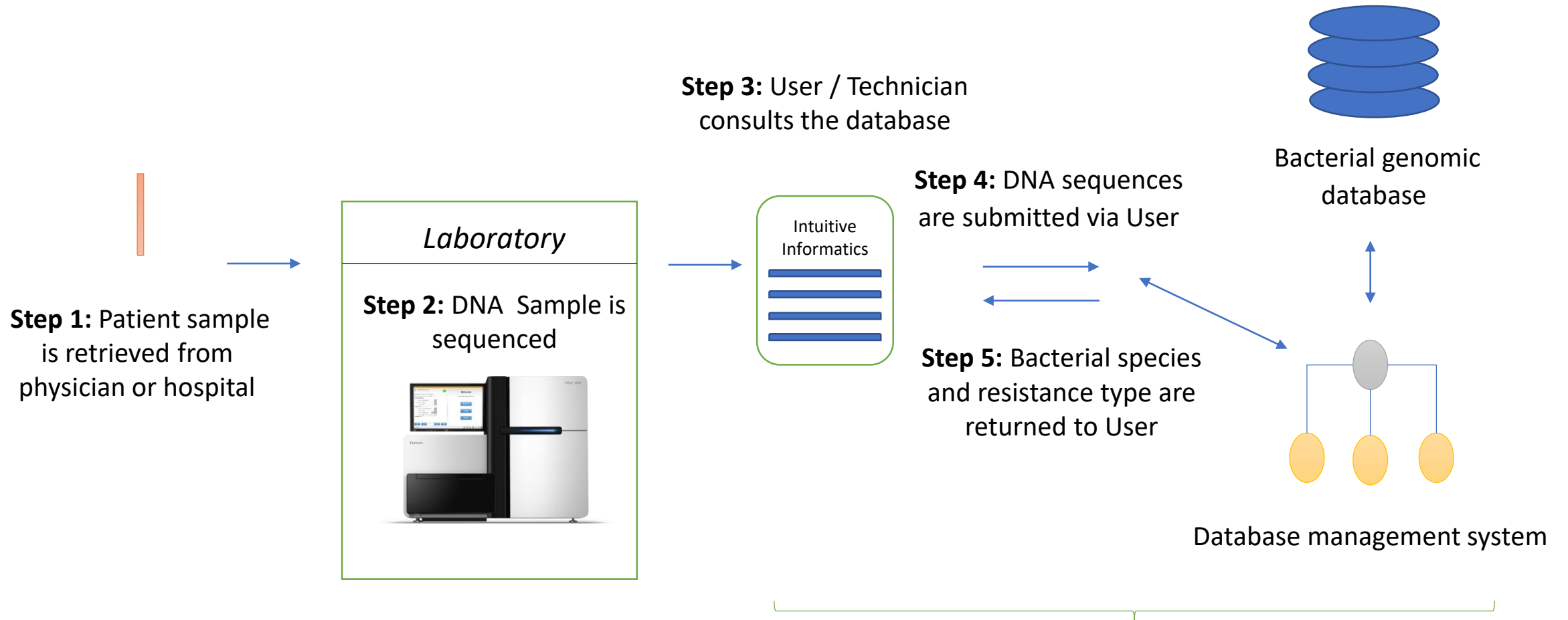
This will

Decrease the diagnostic timeframe in certain cases from weeks or months down to approximately three days and provide an accurate analysis of the bacterial genomic sequences submitted

CURRENT SOLUTION: MOLECULAR TESTING



OUR SOLUTION: DNA TESTING



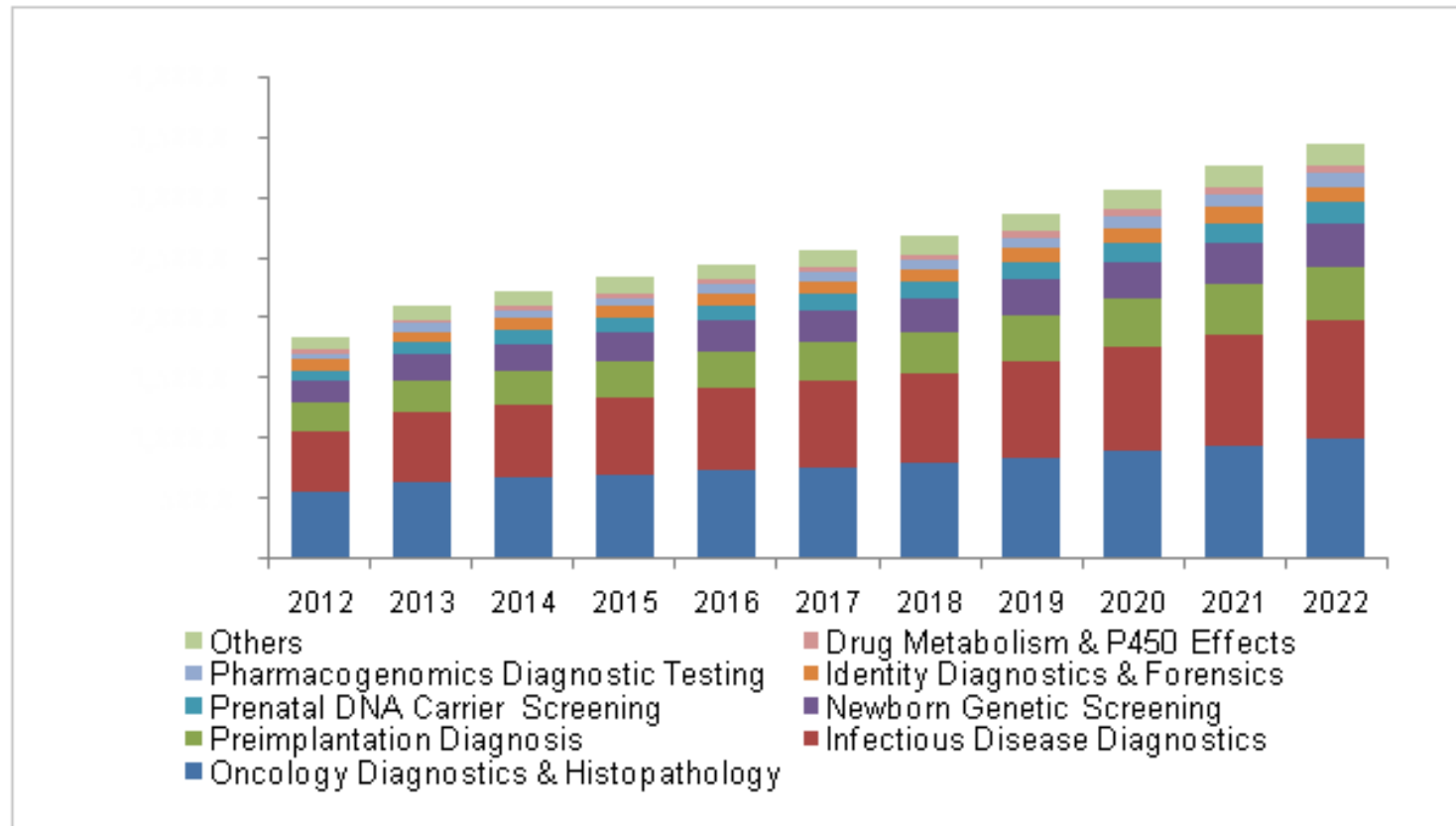
Our software can consistently give accurate results within 2-3 days

ADDRESSABLE MARKET

- **Addressable market of DNA diagnostics of infectious disease is projected at USD 4 billion by 2022**
- Next generation sequencing application for DNA testing is estimated to witness significant progress with a double digit CAGR of over 16%
- The Global DNA diagnostics market is anticipated to reach USD 10.04 billion by 2022

ADDRESSABLE MARKET

U.S. DNA testing market, by application, 2012 - 2022 (USD Million)



COMPETITION

Competitors applying molecular testing methods:

- Long waiting time for result
- Precision of molecular results does not always have high accuracy in identifying bacterial species and resistance type
- These methods are the most reliable we currently have, used widely and the current standard in hospital laboratories

Major companies include: Roche Diagnostics, Qiagen, Novartis

COMPETITION

Competitors applying software for genomic data interpretation:

- There is a subset of companies focusing on traditional bioinformatics and statistical methods and another subset focusing on cutting edge machine learning methods.
- There are no competitors who publicize using both software technologies.
- Many of the competitors specialize in building sequencing machines and provide free software interpretation for better user experience of their hardware. Most are not primarily specialized in software.

Major companies include: Illumina, Oxford Nanopore, Deep genomics

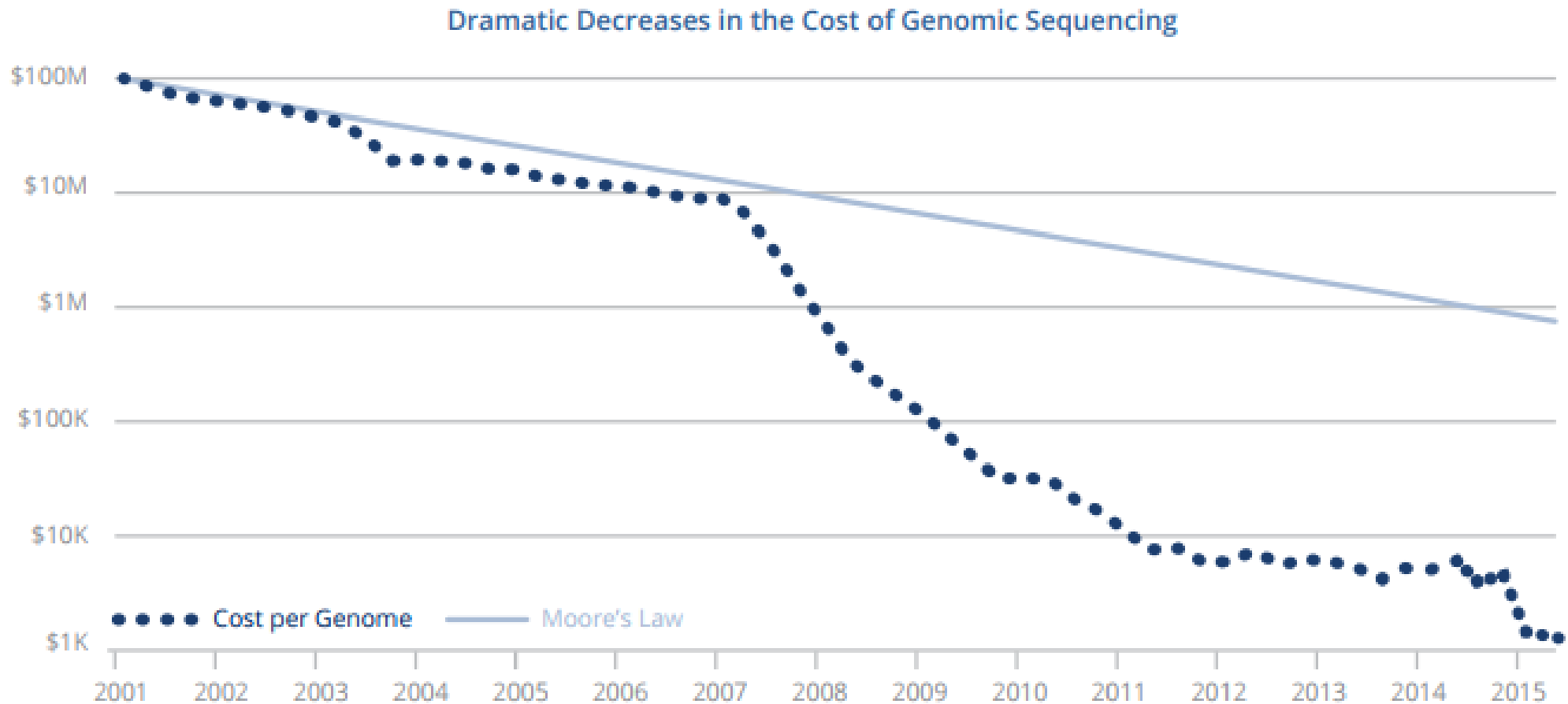


Illustration by Intel and Illumina: The cost per genome is descending at a steeper slope than Moore's law. Therefore, a shift towards sequence based diagnostics is projected to take effect in the near future due to overall decrease of diagnostic costs by preferring genomic based identification over molecular based identification of infectious disease.

MARKET RESEARCH

“Several high-throughput sequencing platforms are now chasing the USD 1,000 human genome. Given that the average bacterial genome is less than one-thousandth the size of the human genome, a back-of-the-envelope calculation suggests that a \$1 bacterial genome sequence is an imminent possibility.”

Loman et al. (2012) Nature Reviews Microbiology

Didelot, X., Bowden R., Wilson D. J., Peto T. E. and Crook D. W. (2012) Transforming clinical microbiology with bacterial genome sequencing. Nat Rev Genet 13: 601-612

The authors compare the current practices of identifying and typing bacteria to a workflow based on next-generation sequencing. They predict that the application of next-generation sequencing will soon be sufficiently fast, accurate and cheap to be used in routine clinical microbiology practice. It could replace many complex techniques currently used in clinical microbiology practice with a single, more efficient workflow. The review goes on to discuss the changes that will be required in the organization, skill mix and infrastructure of diagnostic laboratories to adopt this technology.

PRIMARY MARKET RESEARCH

The current problem and pain in the market was found by interviewing 10 academics in the field, including researchers, professors and physicians.

An iterative process will be applied in partnership with hospital laboratories to narrow down the problem until the product is feasible for commercialization.

THE TEAM



Sarah Joseph
Founder
Biochemist | Informatician



Michael Bingel
Technological Advisor
Landing Pad Manager
Australian Commission



Tomasz Zemojtel
Scientific Advisor
Head Genomics Platform
Berlin Institute of Health

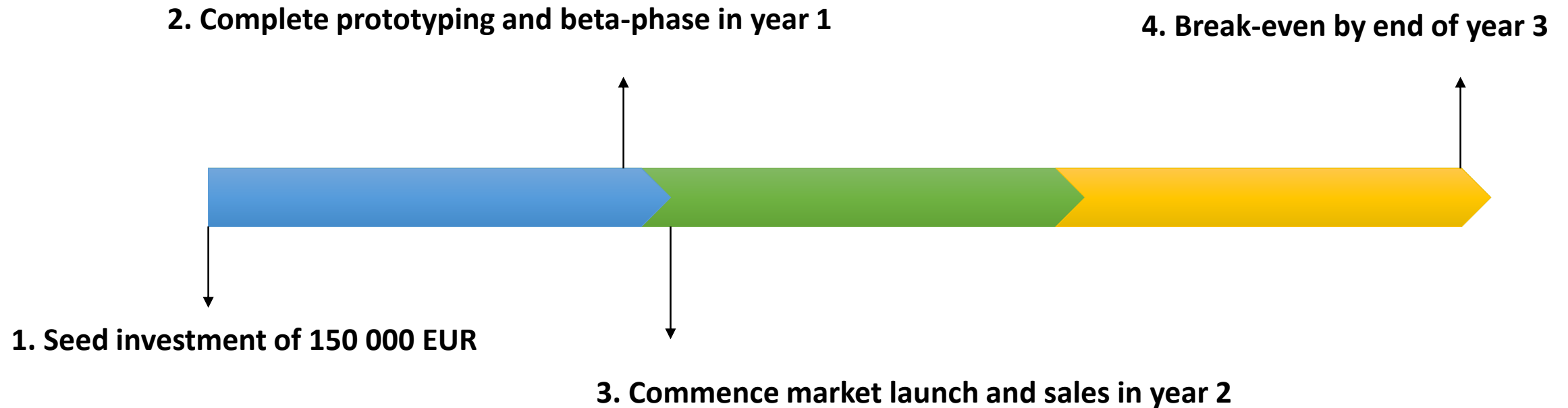


Nathan Williams
Technological | Business
Advisor & Mentor
CEO at Minespider



Sonja Jost
Business Advisor
CEO at DexLeChem

NEXT STEPS: MILESTONES



FINANCIAL FORECAST

Year 1	January	February	March	April	May	June	July	August	September	October	November	December
cash balance	0.00 €	141,037.00 €	133,074.00 €	125,111.00 €	117,148.00 €	109,185.00 €	101,222.00 €	93,259.00 €	85,296.00 €	77,333.00 €	69,370.00 €	61,407.00 €
cash receipts	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
users recruited	0	0	0	0	0	0	0	0	0	0	0	0
total users	0	0	0	0	0	0	0	0	0	0	0	0
sales	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
investment	150,000.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
total cash receipts	150,000.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
cash disbursements	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
marketing	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
advertising	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
insurance	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €
legal	1,000.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	3,000.00 €
licenses	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	1,000.00 €
equipment	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €
bioinformatician	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €
software engineer	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €
sales manager	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
intern sales team	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
office space	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €
income tax	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
total disbursement	8,963.00 €	7,963.00 €	7,963.00 €	7,963.00 €	7,963.00 €	7,963.00 €	7,963.00 €	7,963.00 €	7,963.00 €	7,963.00 €	7,963.00 €	11,963.00 €
net cash flow	141,037.00 €	-7,963.00 €	-7,963.00 €	-7,963.00 €	-7,963.00 €	-7,963.00 €	-7,963.00 €	-7,963.00 €	-7,963.00 €	-7,963.00 €	-7,963.00 €	-11,963.00 €
cumulative cash flow	141,037.00 €	133,074.00 €	125,111.00 €	117,148.00 €	109,185.00 €	101,222.00 €	93,259.00 €	85,296.00 €	77,333.00 €	69,370.00 €	61,407.00 €	49,444.00 €

FINANCIAL FORECAST

Year 2	January	February	March	April	May	June	July	August	September	October	November	December
cash balance	49,444.00 €	48,331.00 €	48,218.00 €	48,105.00 €	47,992.00 €	47,879.00 €	47,766.00 €	47,653.00 €	47,540.00 €	47,427.00 €	47,314.00 €	47,201.00 €
cash receipts	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
users recruited	5	5	5	5	5	5	5	5	5	5	5	5
total users	5	10	15	20	25	30	35	40	45	50	55	60
sales	12,000.00 €	12,000.00 €	12,000.00 €	12,000.00 €	12,000.00 €	12,000.00 €	12,000.00 €	12,000.00 €	12,000.00 €	12,000.00 €	12,000.00 €	12,000.00 €
investment	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
total cash receipts	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
cash disbursements	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
marketing	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
advertising	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
insurance	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €
legal	1,000.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	3,000.00 €
licenses	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	1,000.00 €
equipment	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €
bioinformatician	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €
software engineer	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €
sales manager	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €
intern sales team	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €
office space	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €
income tax	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
total disbursement	13,113.00 €	12,113.00 €	12,113.00 €	12,113.00 €	12,113.00 €	12,113.00 €	12,113.00 €	12,113.00 €	12,113.00 €	12,113.00 €	12,113.00 €	16,113.00 €
net cash flow	-1,113.00 €	-113.00 €	-113.00 €	-113.00 €	-113.00 €	-113.00 €	-113.00 €	-113.00 €	-113.00 €	-113.00 €	-113.00 €	-4,113.00 €
cumulative cash flow	48,331.00 €	48,218.00 €	48,105.00 €	47,992.00 €	47,879.00 €	47,766.00 €	47,653.00 €	47,540.00 €	47,427.00 €	47,314.00 €	47,201.00 €	43,088.00 €

FINANCIAL FORECAST

Year 3	January	February	March	April	May	June	July	August	September	October	November	December
cash balance	43,088.00 €	51,475.00 €	60,862.00 €	70,249.00 €	79,636.00 €	89,023.00 €	98,410.00 €	107,797.00 €	117,184.00 €	126,571.00 €	135,958.00 €	145,345.00 €
cash receipts	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
users recruited	5	5	5	5	5	5	5	5	5	5	5	5
total users	65	70	75	80	85	90	95	100	105	110	115	120
sales	24,000.00 €	24,000.00 €	24,000.00 €	24,000.00 €	24,000.00 €	24,000.00 €	24,000.00 €	24,000.00 €	24,000.00 €	24,000.00 €	24,000.00 €	24,000.00 €
investment	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
total cash receipts	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
cash disbursements	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
marketing	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
advertising	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
insurance	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €	83.00 €
legal	1,000.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	3,000.00 €
licenses	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	1,000.00 €
equipment	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €	830.00 €
bioinformatician	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €
software engineer	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €
sales manager	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €	2,900.00 €
intern sales team	3,750.00 €	3,750.00 €	3,750.00 €	3,750.00 €	3,750.00 €	3,750.00 €	3,750.00 €	3,750.00 €	3,750.00 €	3,750.00 €	3,750.00 €	3,750.00 €
office space	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €	1,250.00 €
income tax	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €	0.00 €
total disbursement	15,613.00 €	14,613.00 €	14,613.00 €	14,613.00 €	14,613.00 €	14,613.00 €	14,613.00 €	14,613.00 €	14,613.00 €	14,613.00 €	14,613.00 €	18,613.00 €
net cash flow	8,387.00 €	9,387.00 €	9,387.00 €	9,387.00 €	9,387.00 €	9,387.00 €	9,387.00 €	9,387.00 €	9,387.00 €	9,387.00 €	9,387.00 €	5,387.00 €
cumulative cash flow	51,475.00 €	60,862.00 €	70,249.00 €	79,636.00 €	89,023.00 €	98,410.00 €	107,797.00 €	117,184.00 €	126,571.00 €	135,958.00 €	145,345.00 €	150,732.00 €