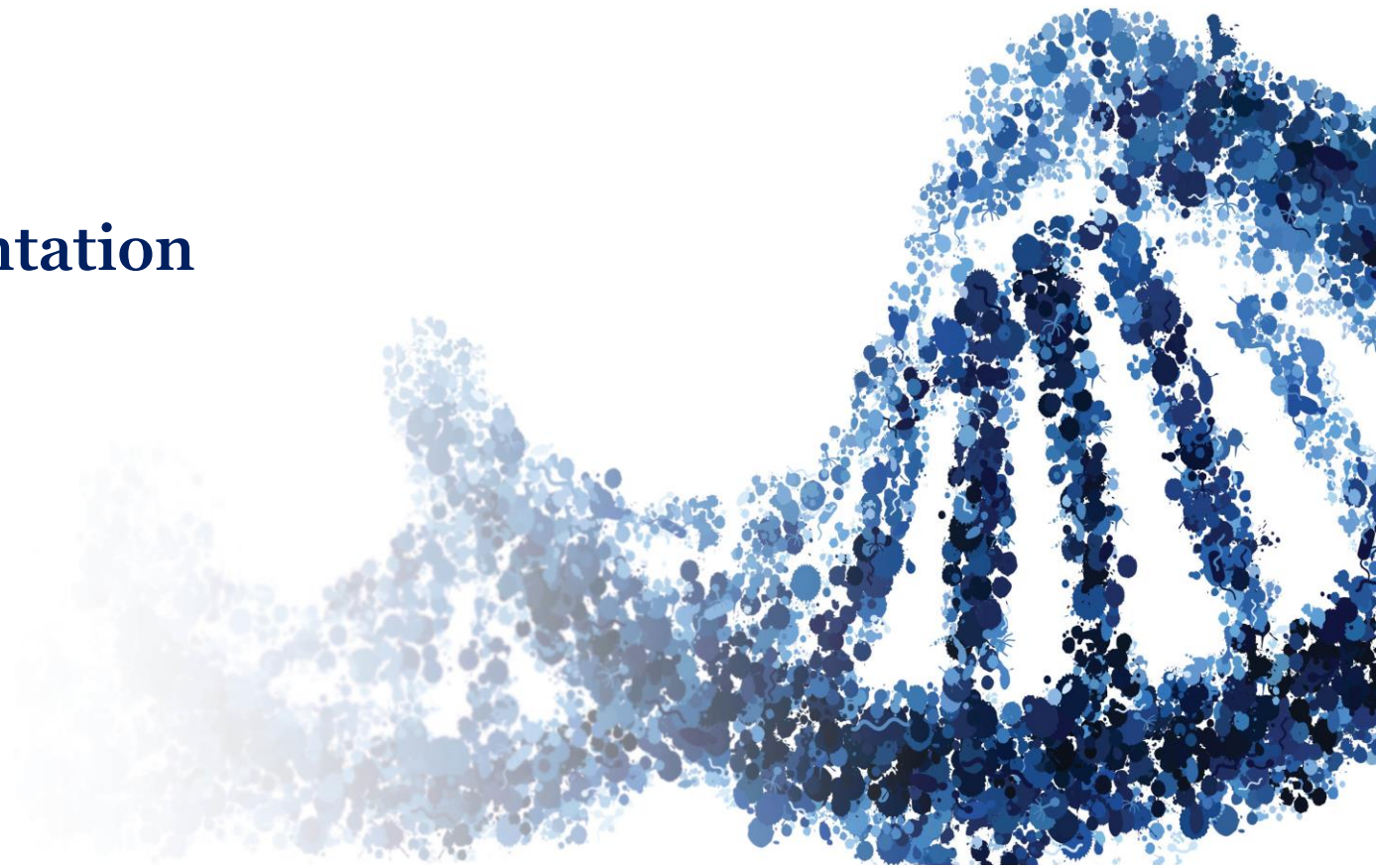




# Company Presentation

December 2019



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# Microba scientific team



**Prof Phil Hugenholtz** is Microba's co-founder and a world-leading expert in microbiome analysis.



**Prof Gene Tyson** is Microba's co-founder and a world-leading expert in microbiome analysis. He was the first person to publish the use of metagenomics for profiling microbial communities.



**Assoc Prof Lutz Krause** is an internationally recognised expert in the application of big data methods to understand molecular biology. He leads the artificial intelligence data analysis for the identification of therapeutic leads.



**Dr Páraic Ó Cuív** is the Lead of Live Biotherapeutics. He has extensive experience in IBD research and leads the isolation and pre-clinical testing of microbiome derived biopharmaceuticals.



**Prof Ian Frazer** is a Clinical Immunologist and inventor of the Gardasil vaccine. He is director of Microba and chair of Microba's clinical advisory board.



**Dr Jakob Begun** is a Harvard trained Gastroenterologist with an international reputation in IBD research.



**Dr Paul Griffin** is an Infectious Diseases Physician and Microbiologist and was appointed as the Director of Infectious Diseases at Mater Health Services in 2013.



**Dr Alena Pribyl** is a senior scientist at Microba with a passion for science communication. Dr Pribyl is a leader in microbiome science.



# Company snapshot

Growing Market Share	9,500+ test kits sold	> \$3 million in sales	Offshore distribution agreements
Therapeutic Discovery Platform	World class discovery dataset	800 novel bacterial species discovered	369 species strongly linked to health and disease
Business Operations	38 FTE Including 16 PhDs	Leading technology platform	State-of-the-art high- throughput laboratory

Award Winning  
Australian Company

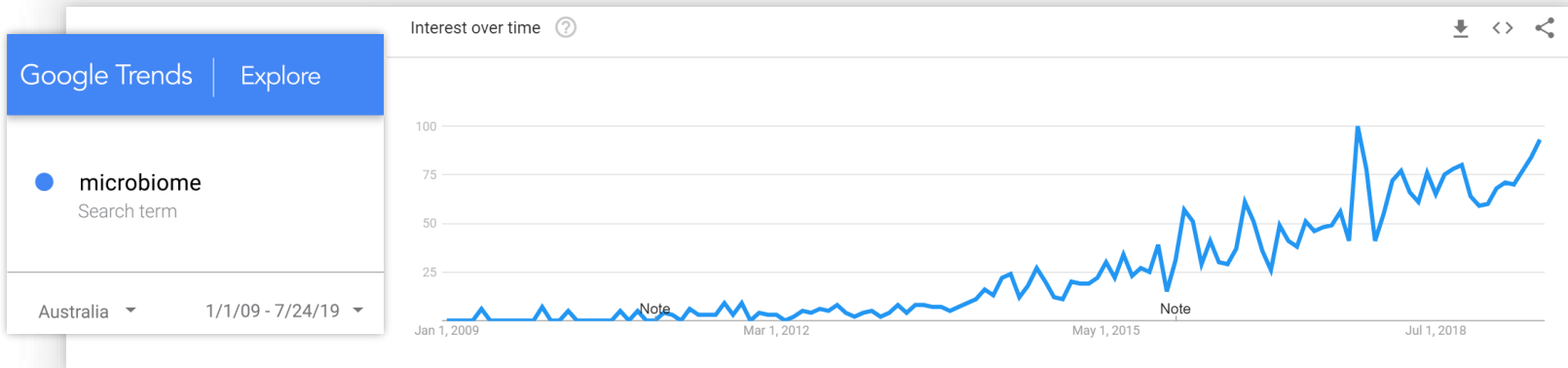
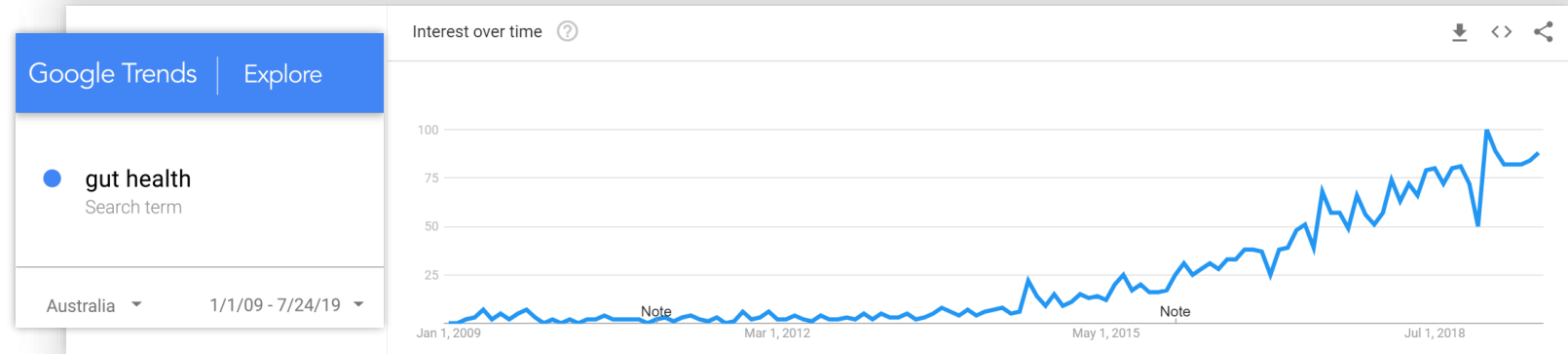
WINNER 2018  
Australian Emerging  
Company of the Year  
**AusBiotech**



**TECH23.2018**  
People's Choice Award 2018

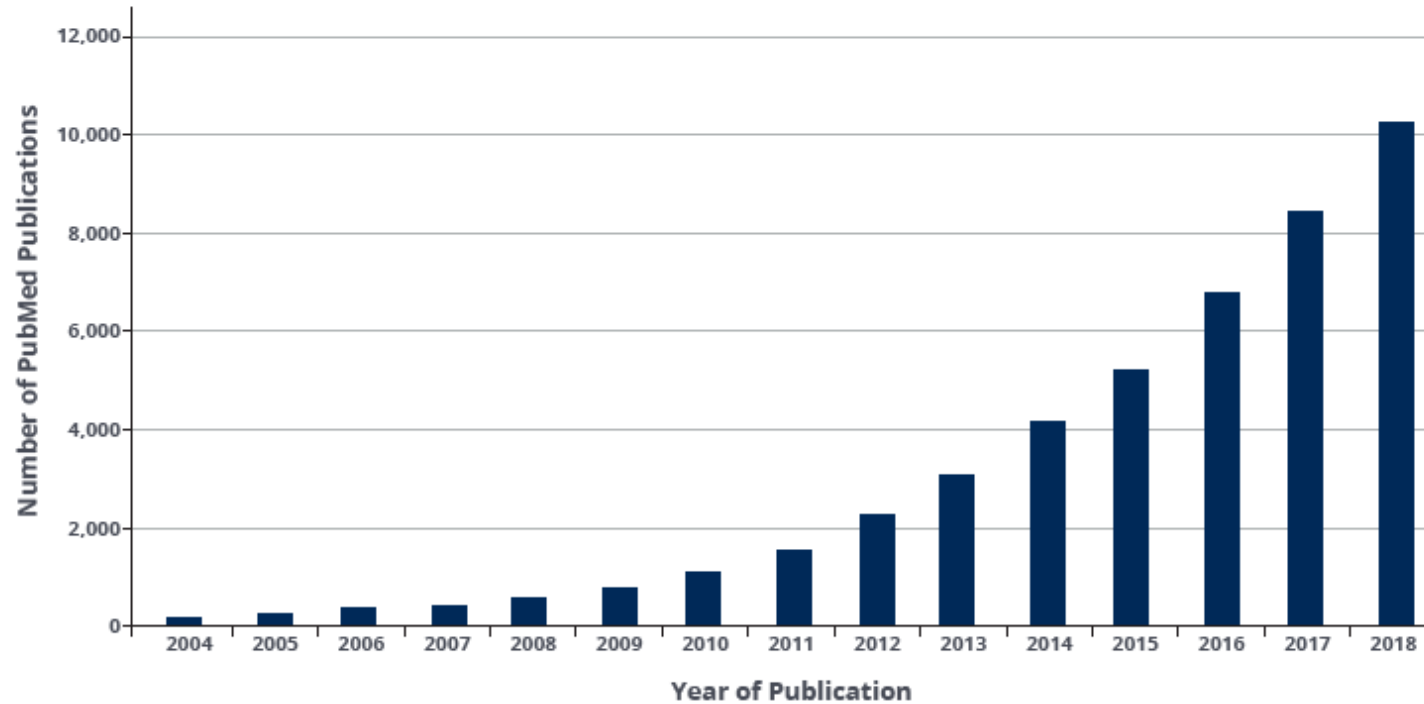


# The microbiome trend



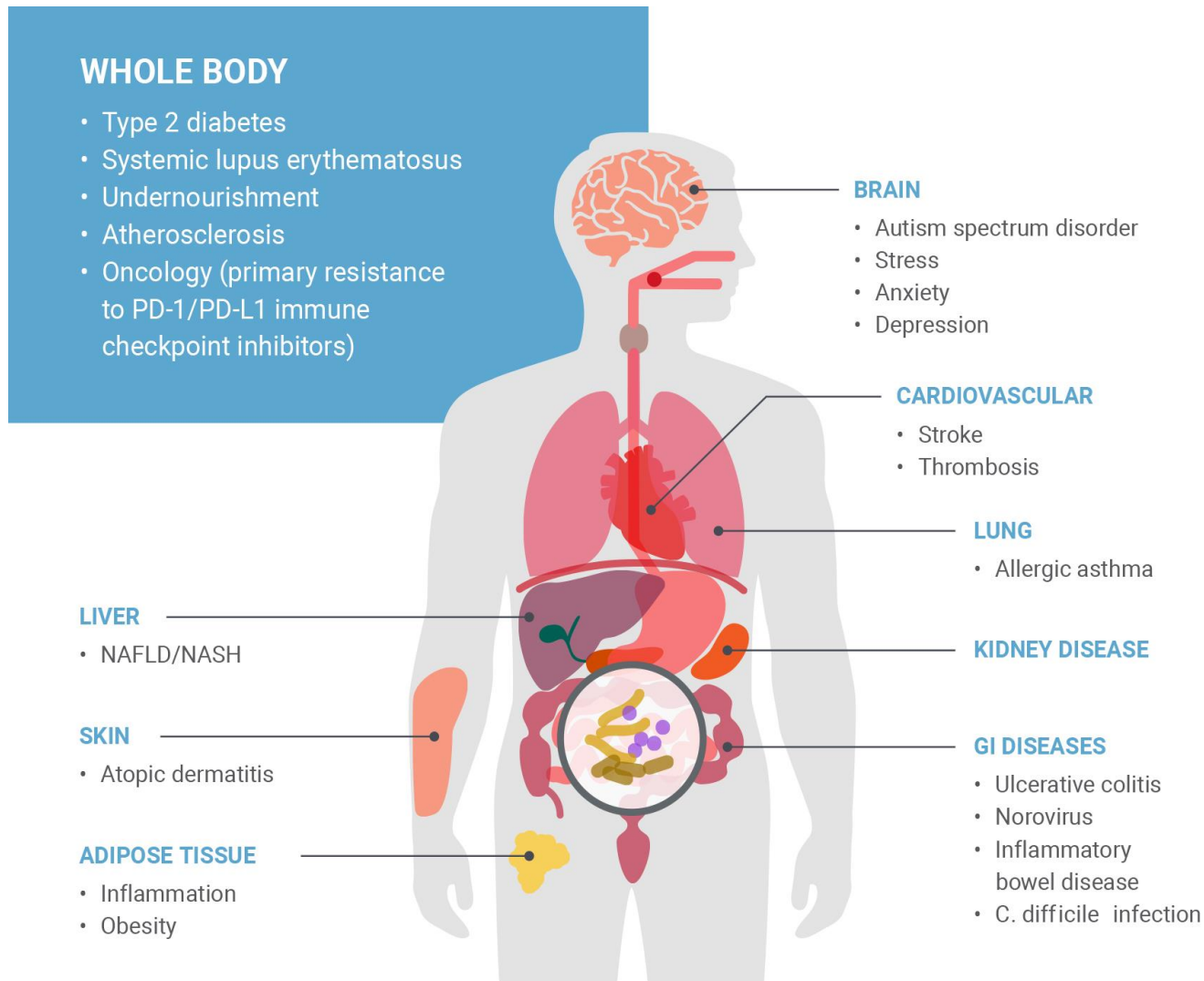
# Growth in microbiome research

**Figure 1.** Increased Academic and Biomedical Research into the Microbiome (2004-2018)\*



\* Syneos Health publication

**Figure 2.** Association of the Gut Microbiome with Disease in the Human Body\*



\* Syneos Health publication

**Table 1.** Association of the gut microbiome with therapeutic effects of drugs\*

Disease	Drug/therapy	Mechanism of therapeutic effect
Type 2 diabetes	Metformin <sup>a</sup>	Metformin alters the gut microbiome composition and induces functional changes, which lead to improved glucose tolerance. <sup>8</sup>
Obesity, and cardiovascular and neurodegenerative diseases	Photobiomodulation (PBM) <sup>a</sup>	PBM can alter microbiome diversity in healthy mice and increase numbers of <i>Allobaculum</i> , a bacterium associated with a healthy microbiome. If this is confirmed in humans, the possibility exists for PBMt to be used as an adjunct therapy in treatment. <sup>16</sup>
Ulcerative colitis	Moxibustion treatment <sup>a</sup>	Moxibustion treatment restored the colonic mucosa and decreased submucosal inflammatory cell infiltration in colitis rats. Findings suggest that moxibustion exerts its therapeutic effect by repairing mucosal tissue damage and modulating the gut microbiome and intestinal mucosal immunity. <sup>17</sup>
Kidney disease	Magnesium lithospermate B (MLB) <sup>a</sup>	The therapeutic effect of MLB on kidney injury might be attributed (at least partially) to its ability to modulate the disordered gut microbiome and bile acid metabolism. In streptozotocin-treated mice, 24-h urinary albumin levels and total fecal BAs, especially cholic acids and deoxycholic acids, were greatly increased compared with control mice. <sup>18</sup>
Obesity-induced insulin resistance and type 2 diabetes	Cucumis melo L. (Cucumis) <sup>a</sup>	Administration of Cucumis improved insulin-resistance by reducing inflammation, thereby changing the gut microbiota composition. Cucumis is thus a promising treatment for obesity-induced insulin resistance and the inflammatory state. <sup>19</sup>
Norovirus infection	Vitamin A	Vitamin A supplementation significantly increased the abundance of <i>Lactobacillus</i> sp. during norovirus infection, which played a crucial role in antiviral efficacy, inhibiting murine norovirus. The antiviral effect of vitamin A occurred via modulation of gut microbiota. <sup>20</sup>
Resistance to immune checkpoint inhibitors targeting PD-1/PD-L1	Oral supplementation of <i>Akkermansia muciniphila</i>	Primary resistance to immune checkpoint inhibitors targeting the PD-1/PD-L1 axis can be attributed to abnormal gut microbiome composition. Oral supplementation with <i>A. muciniphila</i> restored the efficacy of PD-1 blockade. <sup>9</sup>

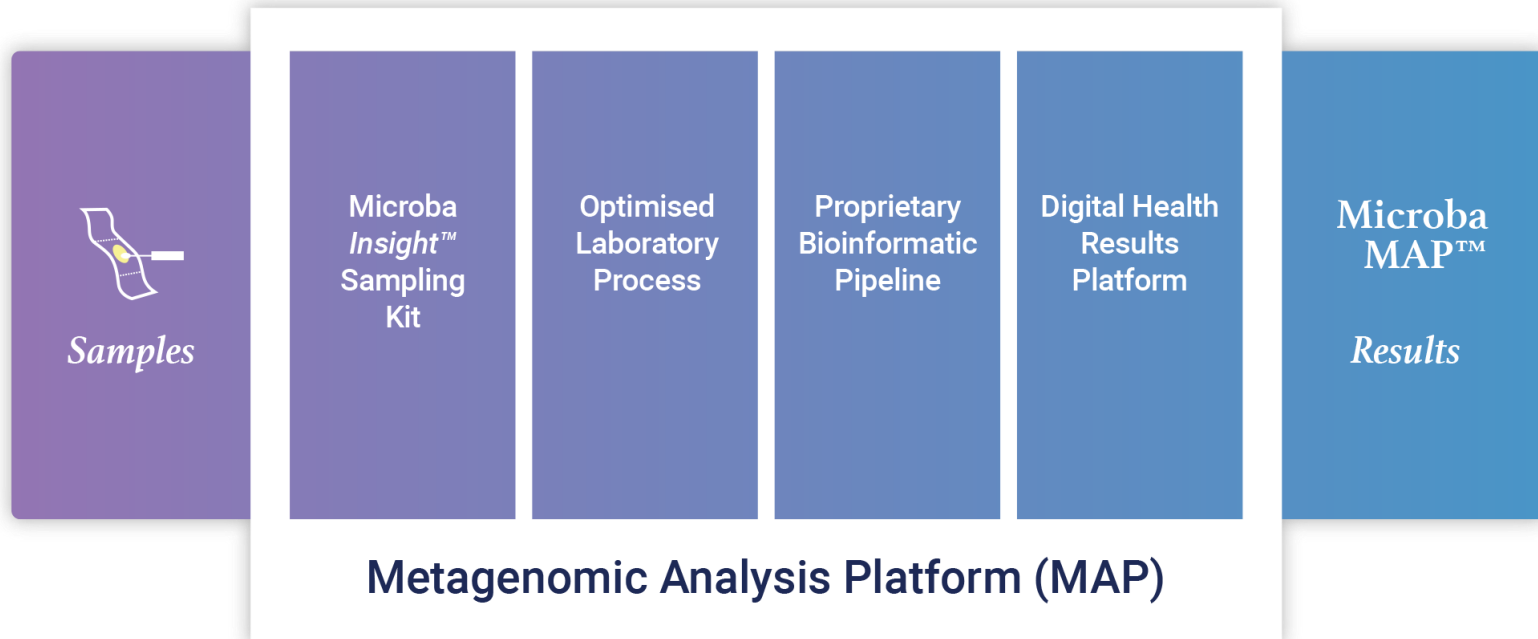
\* Syneos Health publication

\* Drugs/therapies tested on animals. BA, bile acid; PD-1, programmed death receptor-1; PD-L1, programmed death ligand 1.



# Proprietary technology platform

## MAP™ workflow



# Microba services



## Consumer

### Microba *Insight*™

- Direct consumer access to detailed gut health information
- Complementary access to qualified microbiome specialist
- Dietary suggestions based on microbiome information



## Medical

### Microba *MetaPanel*™

- Identification of key pathogens
- Identify community abnormalities (dysbiosis)
- Monitor antimicrobial resistance



## Research

### Microba *MAP*™

- Identification of key pathogens
- Identify community abnormalities (dysbiosis)
- Analyse functional potential of microbiome
- Define relationship between disease state and gut microbiome



# Primary levers for microbiome modulation & the healthcare opportunity

Patient Digestive  
Health baseline



Clinician toolkit  
for Digestive Health

Prebiotics

Probiotics

Antibiotics

Diet

Patient  
monitoring



**1,000+** Healthcare practitioners trained

# Microba distribution model



*MetaPanel™*



America

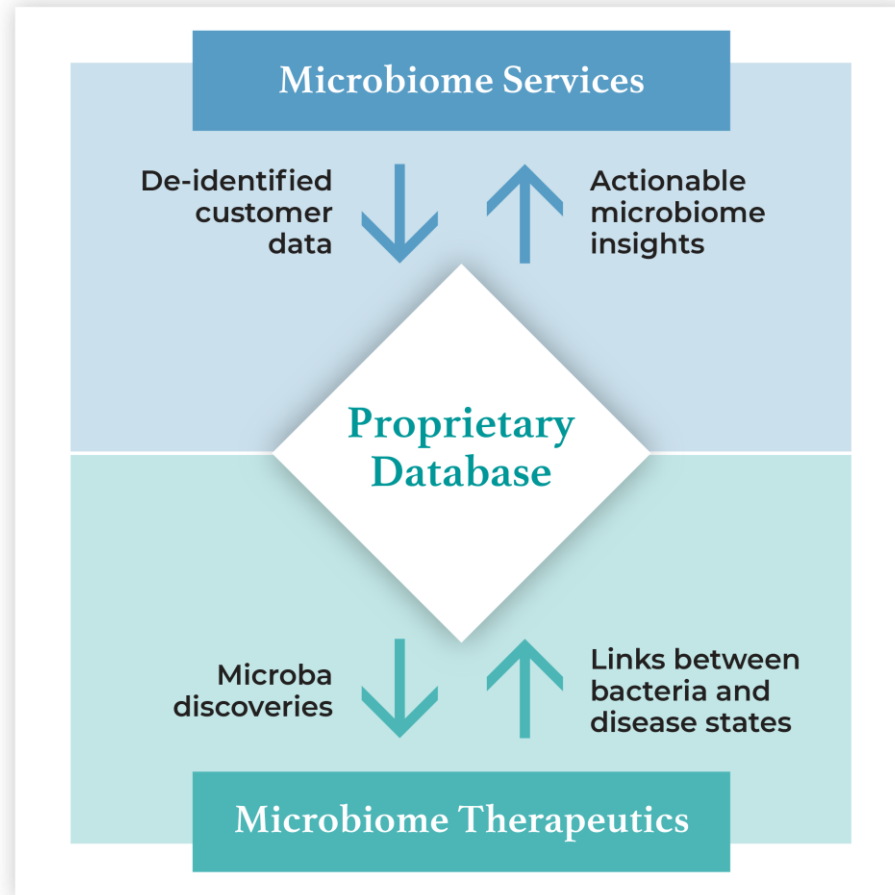
Asia

Europe

Oceania

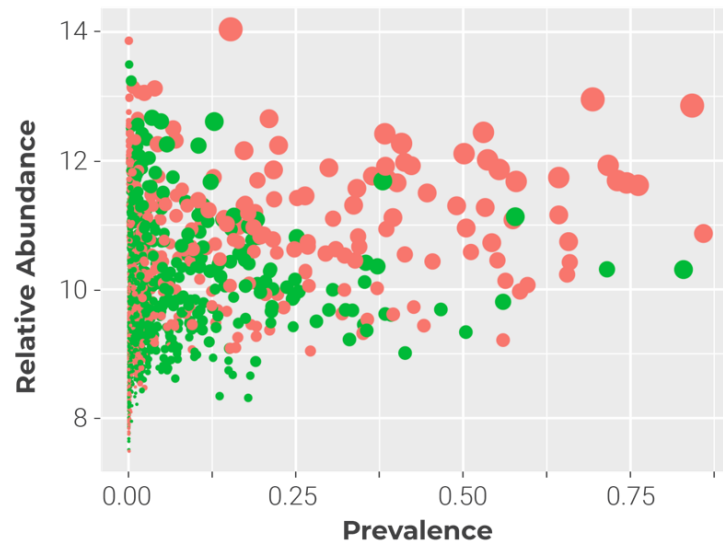
Microba has benchmarked its platform against other competing technologies globally and demonstrated that it is the most comprehensive and accurate microbiome test currently available

# Business model

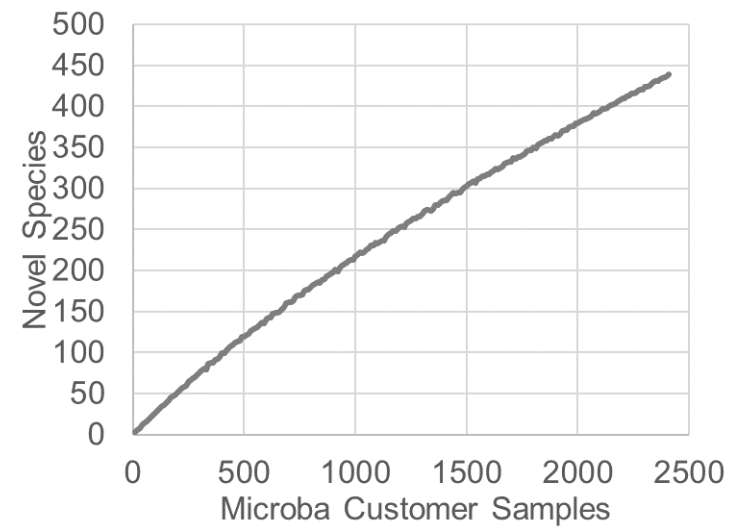


# Microba novel species

Microba discovered species

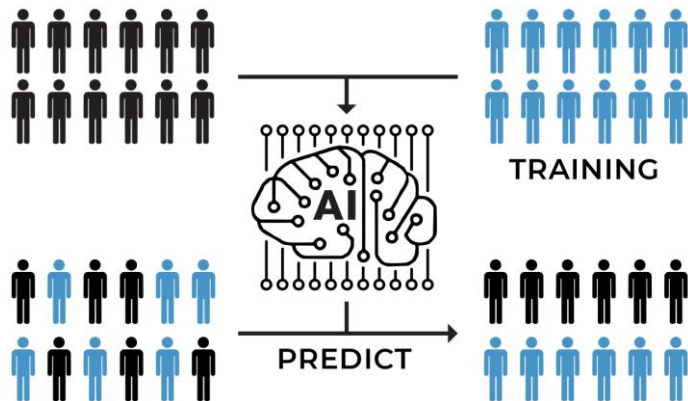


New species discovered every six samples



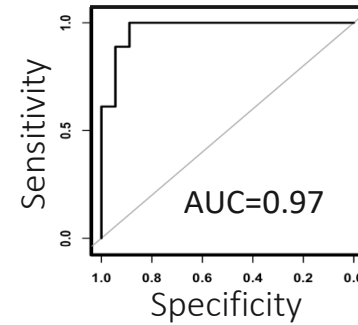
# Diagnostic capability

## AI diagnostic development



## IBD Diagnostic

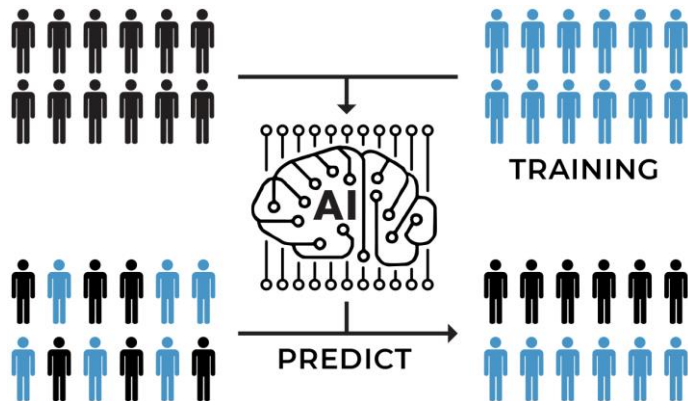
AI-based IBD classifier



Highly accurate – 97% of cases correctly identified

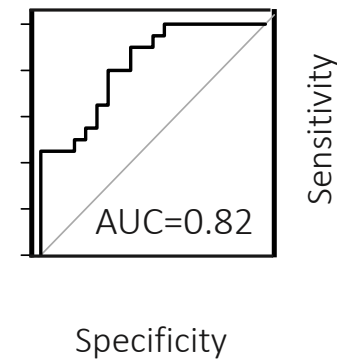
# Companion diagnostics

## AI diagnostic development



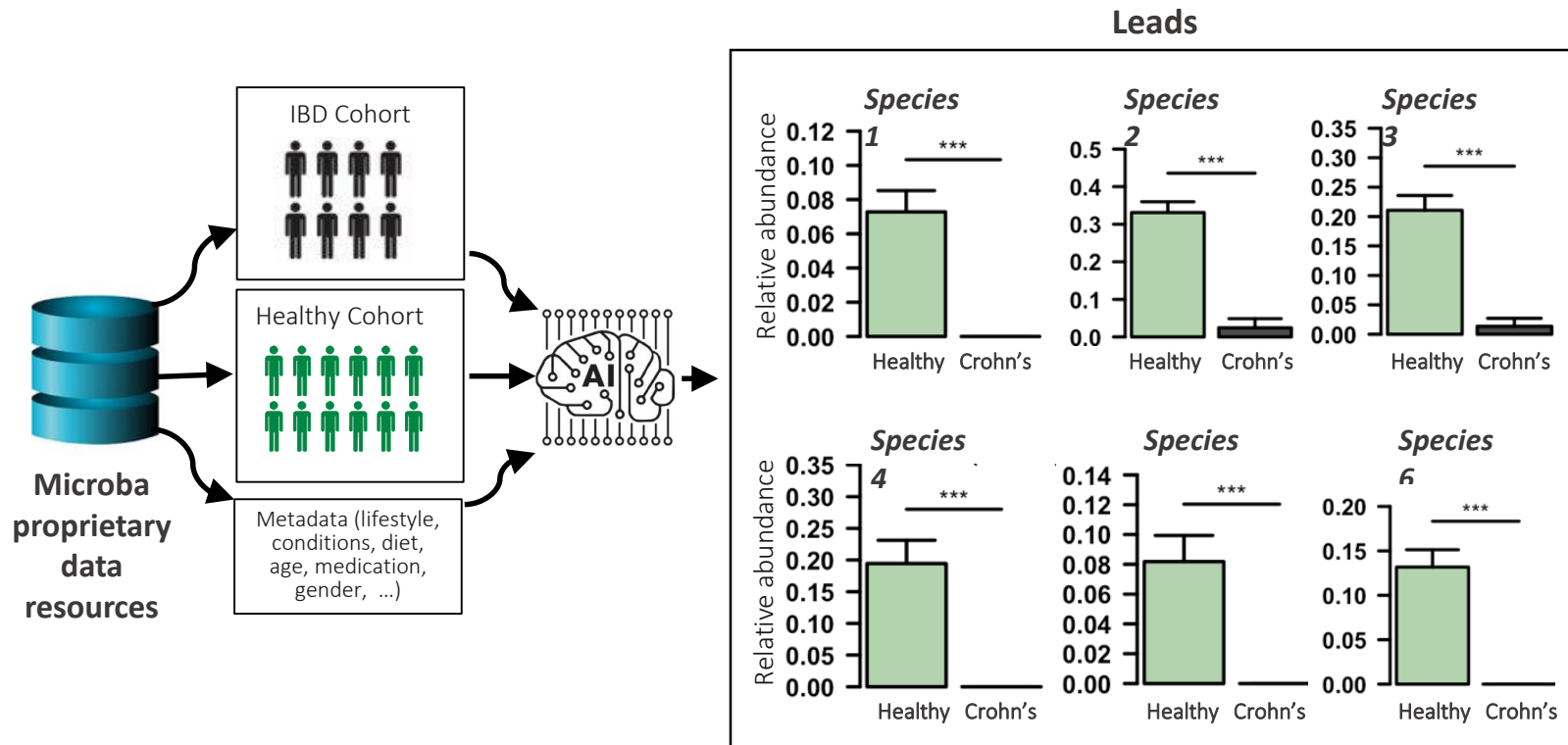
## Treatment response

AI-based classifier to predict response to IBD drug (vedolizumab)

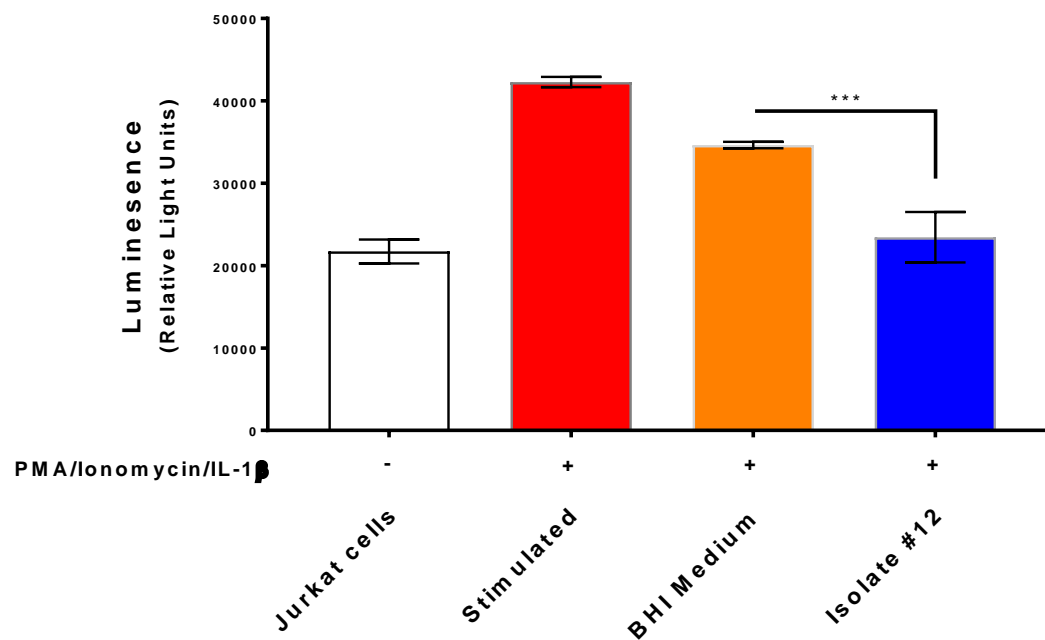




# Microba therapeutic lead generation



## Anti-inflammatory leads



**Microba** isolate suppressing JAK-STAT pathway activation

# Recent deals

## Companies in recent microbiome partnerships



## Relevant transactions



**2018**  
Early stage LBP  
NASDAQ listing \$85m  
raise \$509m market cap



**2018**  
Phase 1 clinical trials of the  
drug, triggering a US\$12M  
milestone payment



**2019**  
Human DNA & database  
\$1.5bn+ market cap  
Possible future listing



**2019**  
Early stage asset pipeline  
Filed for listing  
Up to \$100m raise

## 18 months on...

**9,500+**  
Customers

Partnership with  
Global Precision  
Medicine Company

Flagship Therapeutic  
Program in IBD

**38 FTE**  
Including **16 PhDs**

Leading researchers  
using Microba  
technology platform

Partnership with Australia's  
largest clinician only  
provider of probiotics

Award Winning  
Australian Company

WINNER 2018  
Australian Emerging  
Company of the Year  
**AusBiotech**



**TECH23.2018**  
People's Choice Award 2018



## Financial information

**\$1.8m**

First year revenue (FY19)

**2**

Significant distribution  
deals signed in 2019

**\$9.8m**

Cash in Bank

**1,000+**

Clinicians

**Oct 2017**


Company Launched from  
University of Queensland

**1**

Strategic International Cornerstone  
Investor led Series B and was joined  
by domestic institutions including  
Perennial, Thorney & Alium



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