

iFAST

**Improving outcomes and combating
AMR by giving the best drug every time**

Dr Toby King, CEO





The Problem

Bacteria are increasingly resistant to antibiotics – resistance levels are 20% - 98% and unpredictable

Current Antimicrobial Susceptibility Testing (AST) takes 48 -72 hours – patients deteriorate whilst waiting for the correct drug



Why it Matters

Prescribing inappropriate antibiotics leads to the spread of **resistant infections, sepsis and death**

Antimicrobial resistance (AMR) caused **over 1 million deaths** in 2019* – more than malaria and AIDS combined

* The Lancet, Jan 20, 2022



The iFAST Solution

iFAST reduces AST test time from 48+ to 4 hours



**Blood/urine sample
Incubated**

Sample incubated for a few hours then exposed to range of antibiotics



**Test itself takes 2
minutes**

After a further 1 hour incubation, reader scans sample of bacteria



**Simple RESISTANT or
SUSCEPTIBLE output**

iFAST reader determines optimum antibiotic for clinician to prescribe

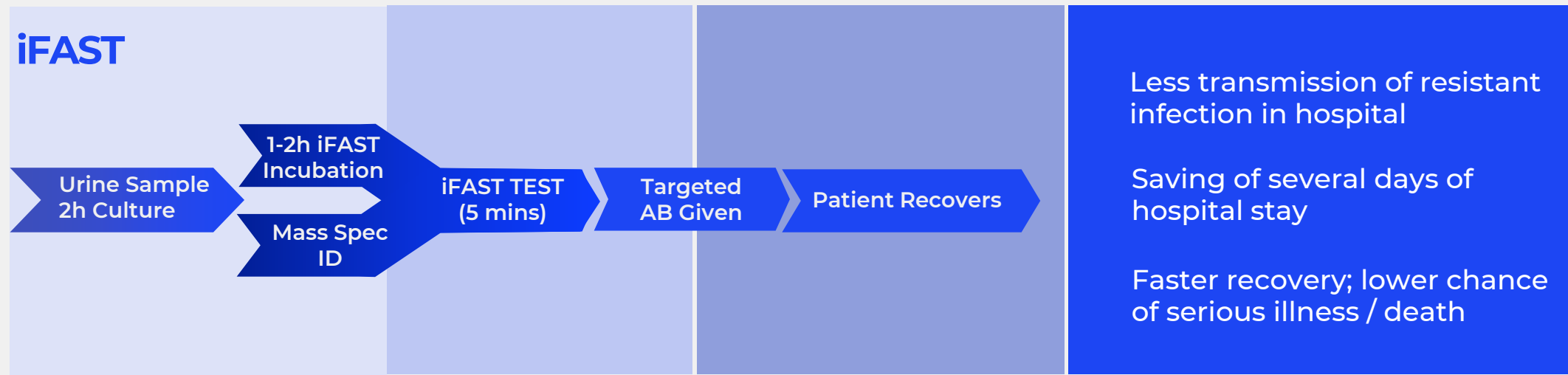
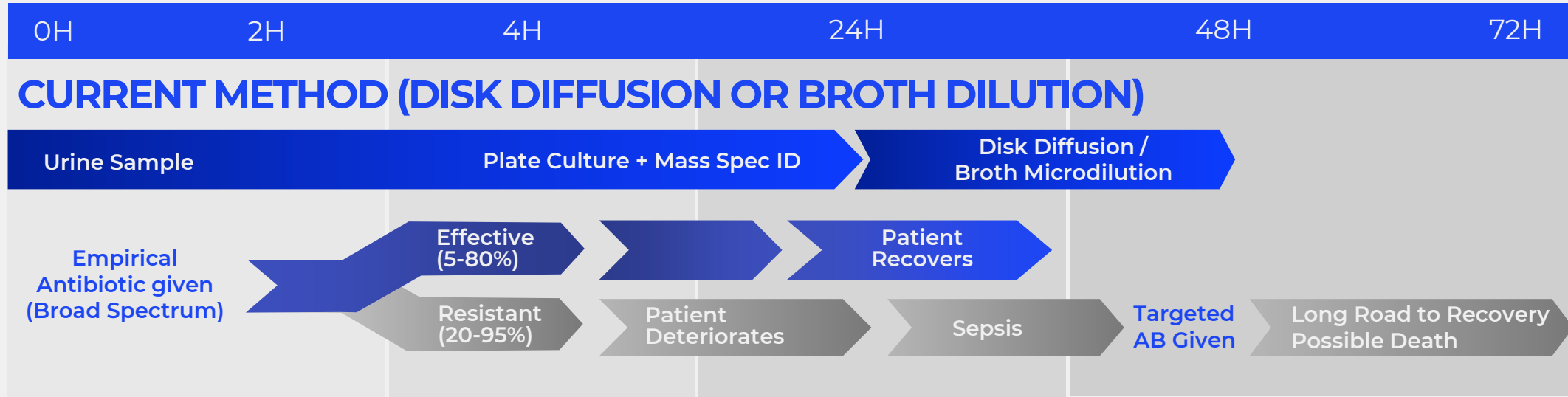
2x GRANTED US/EU PATENTS - FURTHER APPLICATIONS PENDING

The iFAST Solution





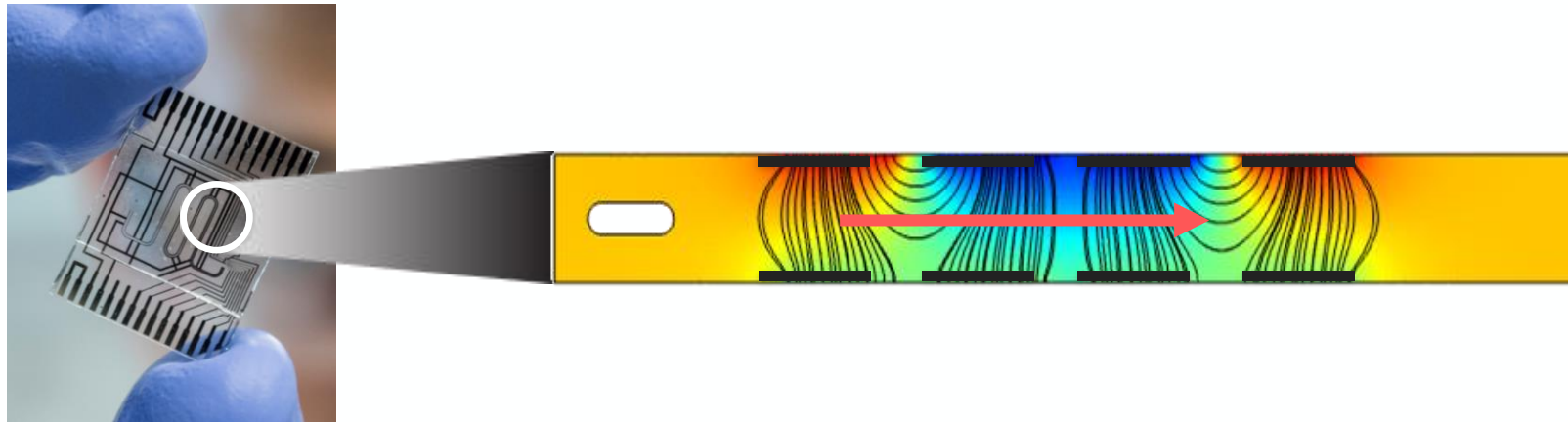
Sample Clinical Workflow – urinary infections





iFAST - Powered by Impedance Flow Cytometry

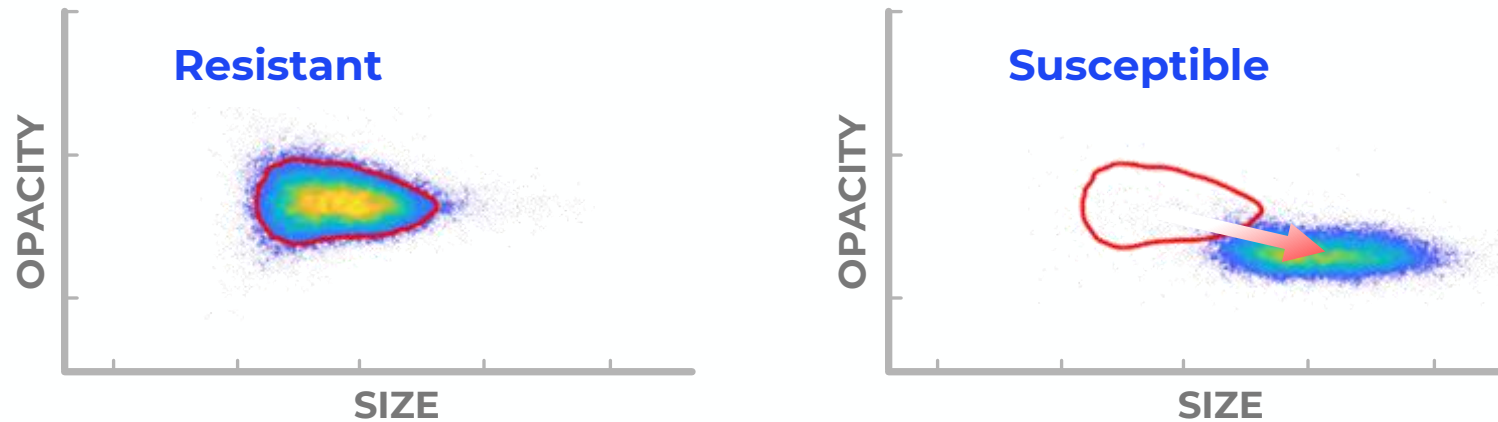
The **electrical properties** of single bacteria are measured at **high speed** in a microfluidic chip.





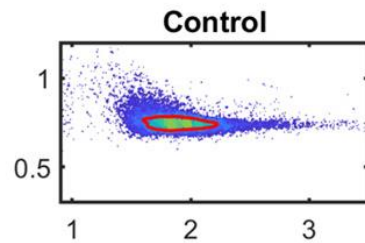
5,000 bacteria analysed in 30 seconds

The electrical signals received from the bacteria are **different if susceptible to the antibiotic** – reader automatically determines result



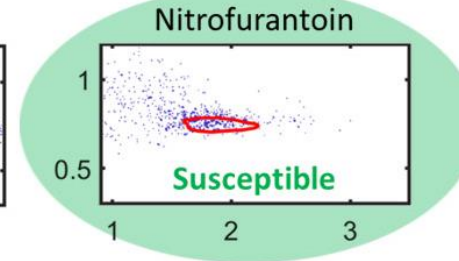
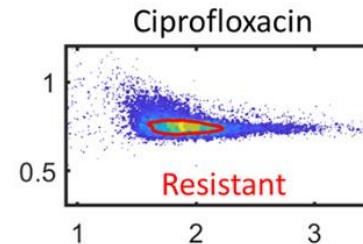
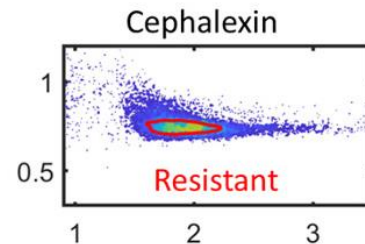
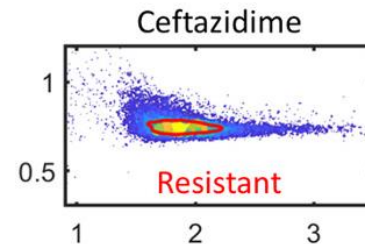
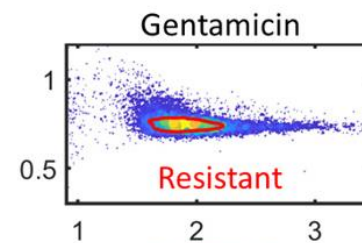
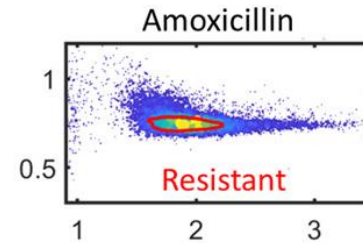
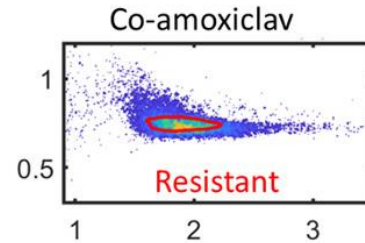
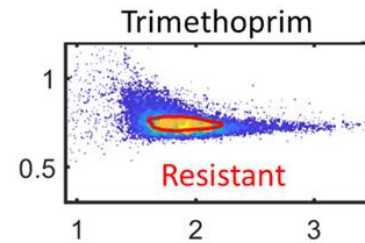
RED CONTOUR IS THE CONTROL SAMPLE (NO DRUG INTERACTION)

iFAST in action – the right drug Day 1



E.coli, strain CFI_033_NDM1

Plots from iFAST system tested by UKHSA
4 hour total test time





Clinical Validation Data

Southampton General Hospital (funded by NIHR, 2022)

Direct comparison on clinical samples between iFAST and Gold standard (Disk Diffusion)

- **99% agreement for urine infections (n=80)**
- **100% agreement for MRSA/MSSA (n=60)**
- **Blood-borne infections being tested currently**

*** ISO standard for AST performance requires >90% agreement (n=300)**



Business Model

**Readers sold/donated to hospital testing labs
– each reader can do 100 tests/day**

**One cartridge per test priced at £5-15
depending on application**

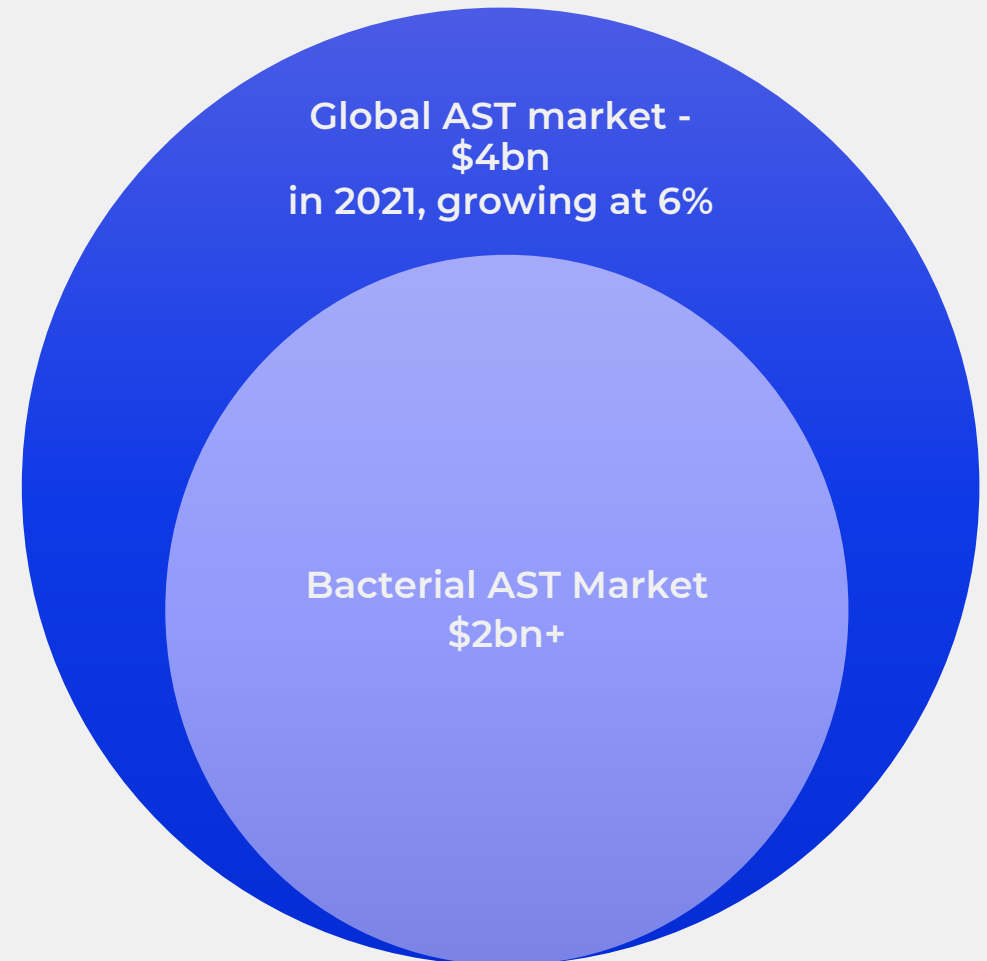
**Early reader sales to research labs for drug
development from late 2023**

**Clear clinical pathway enables approval and
first hospital sales late 2024**



Addressable Market

- Total AST market >\$4bn, of which >50% is bacterial testing
- Urinary tract infections - \$750m
- Bacteraemia / sepsis - \$600m (growing at 10%)
- MRSA - \$150m
- Multiple other applications e.g. respiratory, fungal, STDs, new treatments (phages)





Competition

We are the **ONLY** low cost, high throughput, rapid test

	iFAST	Bacterial Oscillation e.g. Resistell	Genotypic Analysis (PCR)	Accelerate Pheno (Phenotypic)	Automated Broth Dilution e.g. BM Vitek 2	Optical Imaging e.g. QMAC	Disk Diffusion (Gold Std)
Process time (inc. incubation steps)	4h	24h+	12h+	30h+	28h+	26h+	48-72h
High throughput	✓	✗	✗	✗	✗	✗	✓
Cost/test	£6	Unknown	\$50+	V High	High	High	£7-10
Pathogen strain range	All	Unknown	Limited	Unknown	All	All	All
Range of antibiotics	✓	Unknown	✓	Unknown	✓	✓	✓
Workflow compatibility	✓	✗	✓	✗	✓	✗	✓



The Team

Powerful mixture of science,
engineering, clinical and
entrepreneurial experience...



Dr Toby King *(CEO)*
Serial Medtech Entrepreneur
Cambridge/Silicon Valley –
5 successful exits



Prof Hywel Morgan *(CTO)*
University of Southampton (UoS)
Serial Academic Entrepreneur,
Co-Founder; Microfluidics expert



Dr Dan Spencer
(VP Engineering)
Electronics / Software;
Co-Inventor



Prof Mark Sutton
(Advisory Board Chair)
Microbiology Expert, UKHSA
Co-Founder



Prof Rob Read
(Clinical Advisor)
BRC Director at UoS
Member of JCVI



James Otter
(Advisor)
ICI/Zeneca, Spectris, Octopus,
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