



Massively parallel Antimicrobial Susceptibility Testing:

- MICs for all clinically relevant antibiotics
- identification of synergies in up to 20 antibiotic combinations

all in a single, convenient, automated test



BacterOMIC addresses the Antimicrobial Resistance (AMR) crisis by providing today's fastest access to precision antibiotic therapies

AMR kills around 50,000 people each year in the USA and Europe, and is estimated to kill >700,000 people globally.

The Review on Antimicrobial Resistance
Chaired by Jim O'Neill, May 2016

In the USA, >16% of inpatient stays with bacterial infections show evidence of one or more multidrug-resistant organisms, with national costs of USD \$3.4 billion annually.

Johnston, KJ., et al., Health Serv Res. 2019; 54: 782- 792

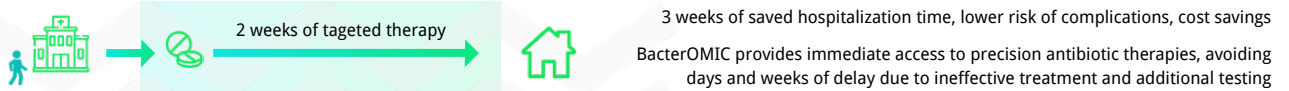
Unfortunately, state-of-the-art testing does not provide enough information to combat AMR

Day 2: result from automated AST
No effective antibiotic found



BacterOMIC provides all the information in a single test

Day 2: complete information for precision therapy



UNIVERSAL AST PANEL

AK	CF	CTR	DOX	MEC	TZP	TMP
AMX	FEP	CXM	ETP	MEM	RIF	SXT
A/C	FIX	C/T	E	MN	SUL	VAN
AMP	CPZ	CHL	FF	MXF	TZD	
A/S	CTX	CIP	FA	NA	TP	
AZM	FOX	CLM	CN	FT	TET	
ATM	CPT	DA	IPM	NOR	T/C	
BP	CAZ	CL	LEV	OFX	TGC	
CFL	CZA	DAP	LZD	PIP	TOB	

- up to 80 antibiotics
- MIC for every antibiotic
- automatic susceptibility classification

SYNERGY AST PANEL

AK-FEP	CN-TET
AK-FT	CN-TMP
AK-PIP	CN-TOB
AK-TMP	FEP-CIP
CIP-PIP	FEP-LEV
CIP-TMP	FEP-PIP
CN-CTX	LEV-NA
CN-FEP	LEV-PIP
CN-FT	TMP-FT
CN-PIP	TMP-TOB

- up to 20 combinations
- FIC for every combination
- automatic combined effect classification

The BacterOMIC Universal Panel and Synergy Panel have been developed in close cooperation with clinicians to address the growing global threat of AMR.

BacterOMIC clear competitive advantages over existing methods and systems

- the first automated system that tests **all** clinically relevant antibiotics in **a single** test
- the first system to test multiple antibiotic combinations to identify synergies effective against MDR

All antibiotics tested in a single panel

	NAME	CARTRIDGE	EASY TO USE	TURNAROUND TIME (H)	NO. ANTIBIOTICS
	BacterOMIC	Chip, 640 chambers	YES	4-18	up to 80
	Vitek 2	Chip, 64 wells	YES	4-18	<16
Automated testing of antibiotic combinations	BD Phoenix	Chip, 136 wells	NO	4-16	up to 31
	MicroScan	96-well plate	NO	3-18	up to 32
Compliance with EUCAST and CLSI guidelines	Sensitre	96-well plate	NO	18-24	~20

Same workflow and pricing as existing products

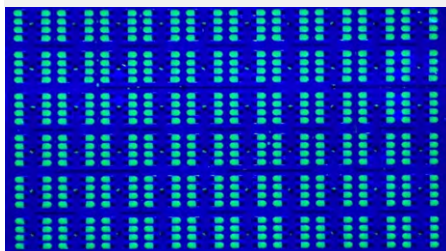
Existing solutions were designed decades ago. BacterOMIC is today's technology for tomorrow's AMR challenges.

Technology

BacterOMIC uses the combination of cutting edge microfluidics, detection, data analysis and automation to offer unprecedented information content, throughput, ease of use with virtually no barrier to adoption.

MICROFLUIDICS

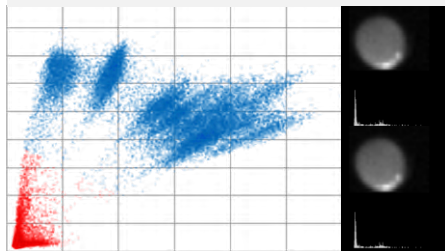
- Proprietary network of incubation microchambers offering unprecedented information density in a single test.
- All-in-one cap and sealing technology offering best-in-class ease of use.



640 isolated microchambers, each presenting a different antibiotic environment

DETECTION AND DATA ANALYSIS

- BacterOMIC tracks microbial growth in real time, using two independent methods for reliability and accuracy.
- Custom signal and data analysis solutions.
- Real-time reporting for MIC and FIC results in the shortest time possible.



Recorded signal from incubation chamber and classification of recorded growth curves

FULLY AUTOMATED TESTING

- High throughput: incubation and real-time analysis of up to 60 panels in parallel. New panels can be added at any time.
- Ergonomic: the manual workflow requires only deposition of the sample onto the cartridge, placement of the all-in-one cap, and insertion of the cartridge into the analyzer.



Analysis of up to 60 cartridges in parallel, with random access

BacterOMIC has been validated in preliminary clinical studies

39 antibiotics tested on reference strains: E. coli ATCC 25922 and/or S. aureus ATCC 29213

Antibiotic	QC%	Antibiotic	QC%
Amikacin	100%	Doxycycline	100%
Amoxicillin	100%	Gentamicin	95%
Amoxicillin-Clavulanic acid	100%	Levofloxacin	100%
Ampicillin	100%	Minocycline	95%
Ampicillin-Sulbactam	100%	Moxifloxacin	100%
Azithromycin	100%	Nitrofurantoin	100%
Aztreonam	100%	Norfloracin	100%
Cefalexin	100%	Ofloxacin	100%
Cephalothin	95%	Piperacillin	100%
Ceftazidime-Avibactam	100%	Piperacillin-Tazobactam	100%
Cefepime	100%	Rifampicin	100%
Cefixime	100%	Tedizolid	100%
Cefoperazone	100%	Teicoplanin	100%
Cefotaxime	100%	Tetracycline	100%
Cefoxitin	95%	Ticarcillin-Clavulanic acid	100%
Ceftazidime	100%	Tobramycin	100%
Ceftriaxone	100%	Trimethoprim	100%
Cefuroxime	100%	Vancomycin	100%
Ciprofloxacin	95%	Trimethoprim-Sulfamethoxazole	100%
Clarithromycin	100%		

15 antibiotics tested on 24 Gram-neg clinical strains against microdilution method

Antibiotic	N	EA%
Ampicillin	144	100%
Aztreonam	144	90%
Cefepime	144	100%
Cefoxitin	144	91%
Cefuroxime	144	98%
Cephalothin	144	98%
Ciprofloxacin	144	100%
Gentamicin	144	99%
Levofloxacin	144	95%
Nitrofurantoin	144	98%
Norfloracin	144	97%
Piperacillin	144	95%
Piperacillin-tazobactam	144	90%
Trimethoprim	144	100%
Trimethoprim-sulfamethoxazole	144	98%

Six replicates were performed for each strain, in order to validate reproducibility

13 antibiotics tested on 86 Gram-neg clinical strains against the Vitek2 system

Antibiotic	EA%	CA%
Amoxicillin-Clavulanic acid	100%	100%
Cefalexin	93%	98%
Cefepime	82%	90%
Cefotaxime	97%	97%
Cefuroxime	97%	97%
Ciprofloxacin	95%	96%
Levofloxacin	94%	95%
Nitrofurantoin	100%	100%
Norfloracin	91%	97%
Piperacillin	96%	92%
Piperacillin-tazobactam	96%	94%
Tobramycin	91%	96%
Trimethoprim-sulfamethoxazole	94%	94%

We tested BacterOMIC in clinical environment, on fresh strains

We are constantly optimising the protocols of antibiotic dispensing and analysis

To pass the test, antibiotics need to show >90% agreement with MIC values for QC strains. Results are calculated from at least 3 independent dispensing days.

In cooperation with:

- Queen Mary University of London
- National Research Institute of Tuberculosis and Lung Diseases, Warsaw, Poland
- National Medicines Institute, Warsaw, Poland



BacterOMIC brings value to all shareholders in the AMR problem

LABORATORIES

Evaluation of up to 80 antibiotics in a single automated test

Automated search for synergistic combinations of antibiotics

Minimization of cost and error risk

HOSPITALS

Fastest access to precision therapies

Access to synergistic treatments against MDR

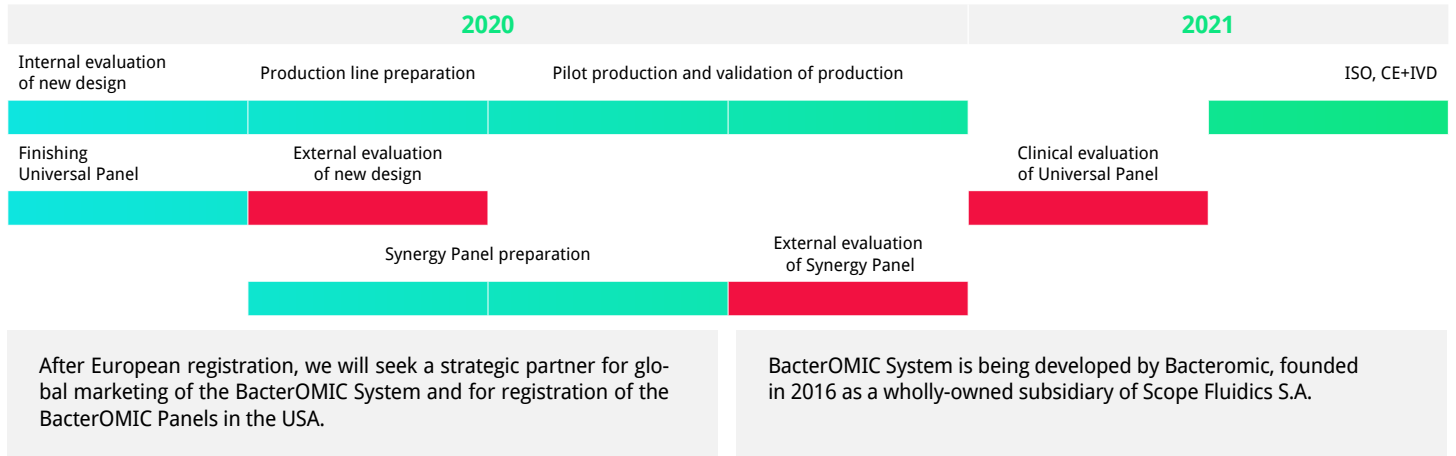
Lower cost

PATIENTS

Effective personalized treatment

Shorter hospitalization and lower risk of complications

Timeline for remaining development, regulatory submission, and market launch



We are seeking strategic partnerships with global med-tech producers and distributors

BacterOMIC is developed by a team of 40 specialists, with expertise in:

- Chemistry
- Medical diagnostics
- Biochemistry
- Microbiology
- Clinical studies
- IP protection
- Mathematics and data analysis
- CAD, CAM design
- Software development and testing
- Electronics and automation

Management team



Piotr Garstecki, CEO

In 2002, Dr. Garstecki earned his PhD in Chemistry from the Institute of Physical Chemistry of the Polish Academy of Sciences. His postdoctoral fellowship, 2002-2005, was with Dr. George Whitesides at the Department of Chemistry and Chemical Biology, Harvard University. He has been a full professor since 2014, has coauthored >100 scientific publications, and filed >100 patent applications.



Marcin Izydorzak, VP

Mr. Izydorzak is a chemist specializing in the physical chemistry of materials and in photophysics. He has 15 years of hands-on experience in managing research and development teams in pharmaceutical and technological companies and has managed the development of a number of marketed pharmaceutical products.



Szymon Ruta, CFO

Mr. Ruta earned his MBA at the University of Warsaw. As an executive, he has >15 years of experience in mergers, acquisitions, investment, and restructuring projects. He serves as the finance director and a supervisory board member of numerous companies, including companies listed on the Warsaw Stock Exchange. As a Managing Director in an investment fund, he was responsible for companies with total value of €125 million.



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