



BACTEROMIC



Scope
Fluidics

Massively parallel Antimicrobial Susceptibility Testing

- MICs for 60 antibiotics,
- FICs for 20 combinations,
in a convenient, automated format.



www.scopefluidics.com www.bacteromic.com

The problem – lack of information



| Urine Culture and Sensitivity | |
|--------------------------------------|--------------------------------------|
| Pus cells /HPF. | 6-7/HPF |
| Colony Count | > 100,000 / ml (Pathogenic Bacteria) |
| Sensitivity Result: | Pseudomonas aeruginosa |
| Sulphamethazole & Trimethoprim (SXT) | Resistant |
| Ampicillin (AMP) | Resistant |
| Cefotaxime (CFT) | Resistant |
| Amoxycilline (AMX) | Resistant |
| Ampicillin + Sulactum (SAM) | Resistant |
| Amoxycilline (AL) | Resistant |
| Tetracycline (TET) | Resistant |
| Oxacilin (OXA) | Resistant |
| Ceftriaxone (CRO) | Resistant |
| Amikacin (AMK) | Resistant |
| Doxycycline (DOX) | Resistant |
| Tigecycline (TIC) | Resistant |
| Ertapenem (ETP) | Resistant |
| Gentamicin (GEN) | Resistant |
| Imipenem (IPEM) | Resistant |
| Meropenem (MEREM) | Resistant |
| Nitrofurantoin (NIT) | Resistant |
| Cefepime(FF) | Resistant |
| Ciprofloxacin (CP) | Resistant |
| Norfloxacin (NOR) | Resistant |
| Levofloxacin (LEV) | Resistant |
| (Colistin (CT) | Resistant |
| Cefoxitin (FOX) | Resistant |
| Piperacilllin (PRL) | Resistant |

R



Need for information



Clinical case: 27 year old patient in Italy

Day 2: result from automated AST
No effective antibiotic found



In Europe alone:

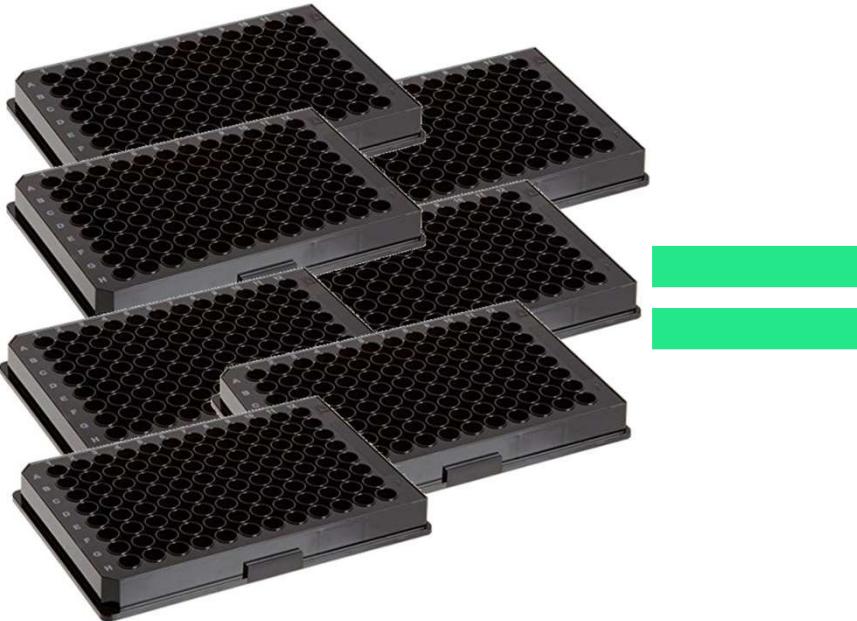
- increased risks and cost for 15 mln hospitalizations / year
- 900 thousand DALYs lost to AMR
- 33 thousand deaths
- 1.5 bln EUR additional cost

clear medical need for comprehensive information without delay

Solution



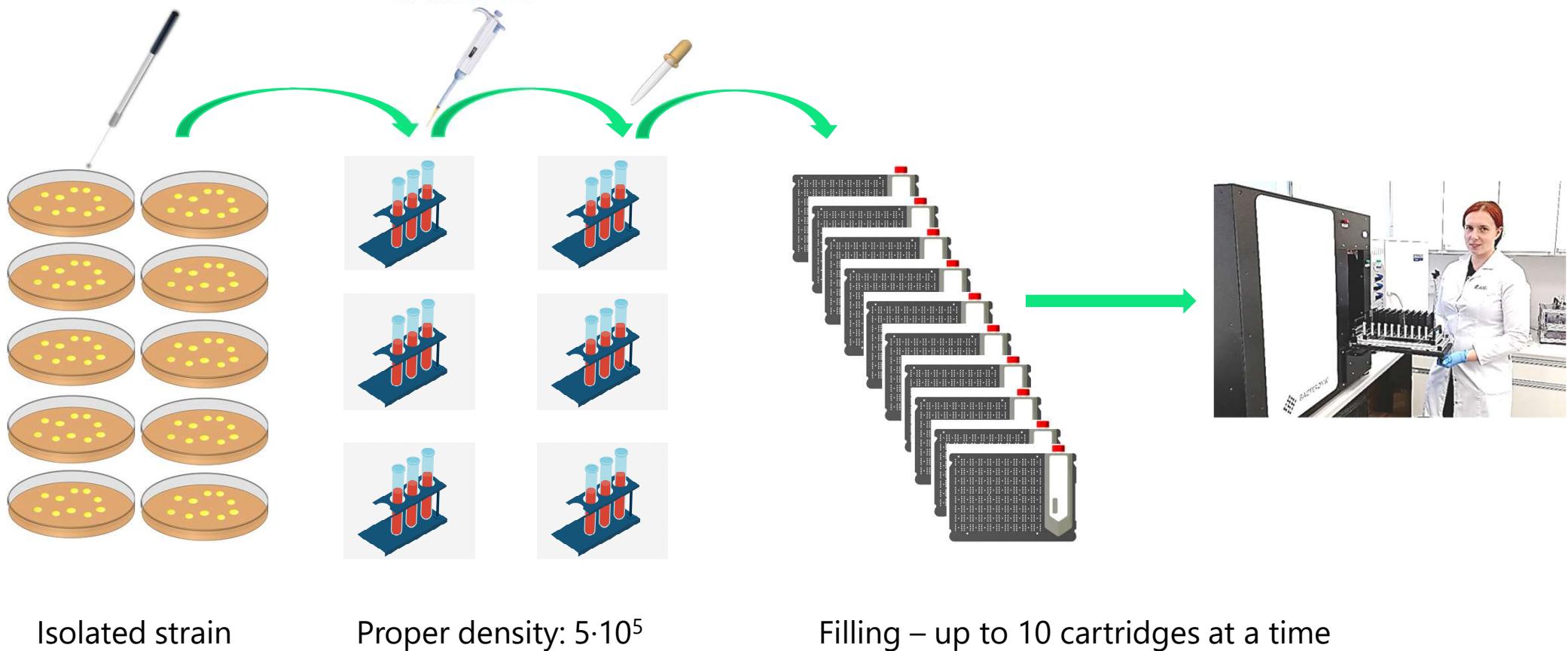
Technology



- 7 well-plates compressed into a cartridge
- **640 isolated microchambers**

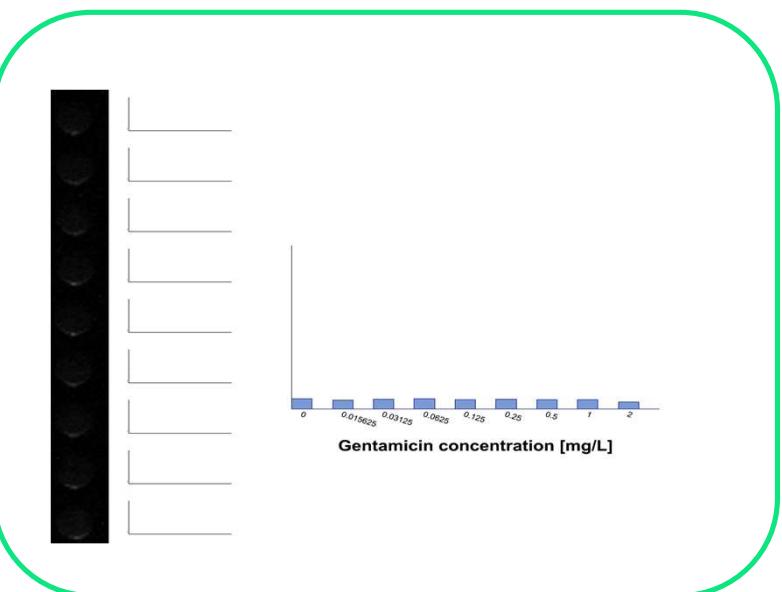
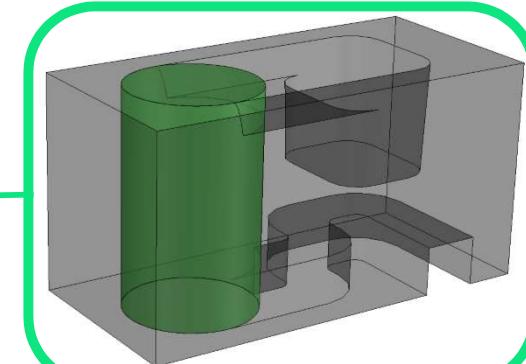
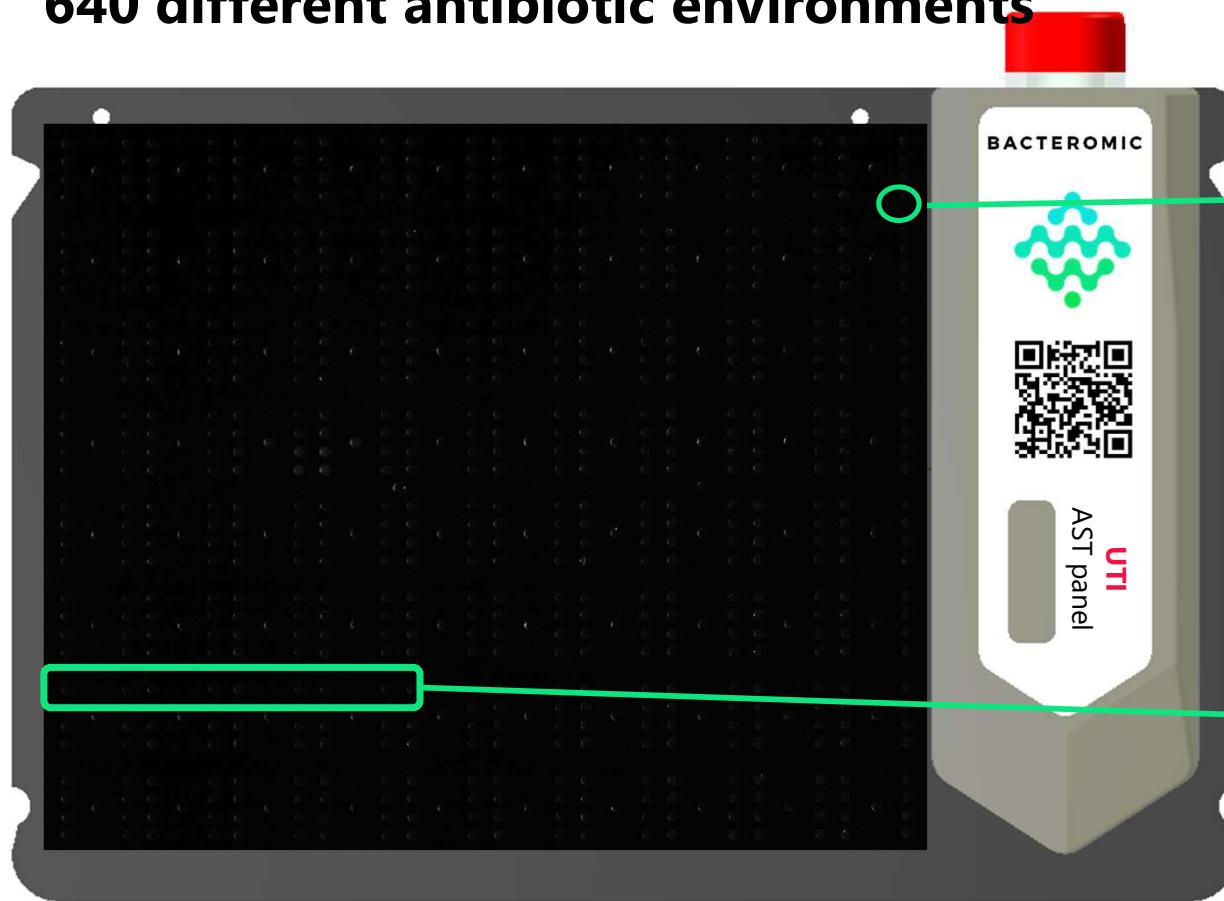
- High throughput –
60 panels in parallel
- Random access

Workflow consistent with recommendations



Technology

640 different antibiotic environments

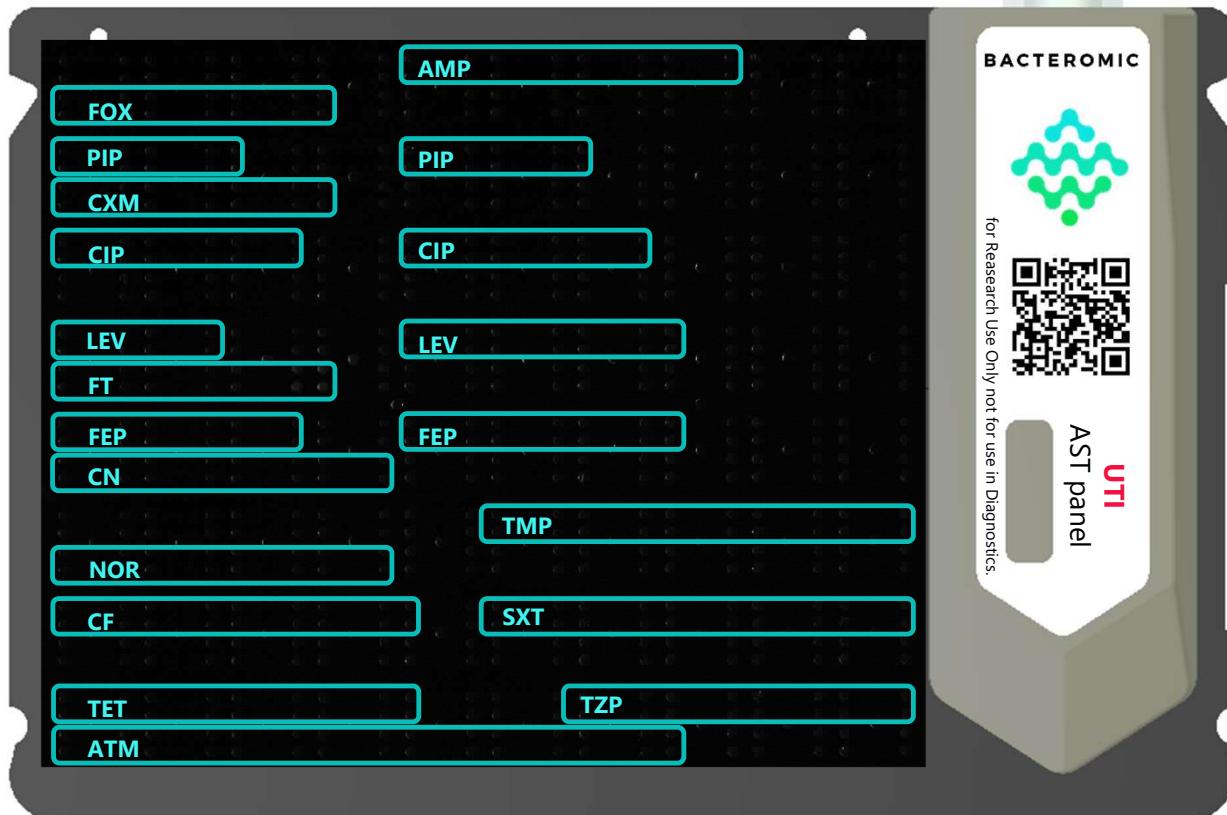


antibiotics dispensed with I-Dot One from dispendix



UNIVERSAL AST panel

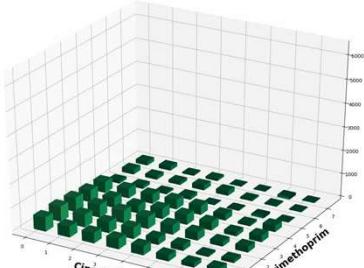
- Test for both Gram(-) and Gram(+) bacteria
- Majority of clinically used antibiotics:
57 different agents
- Most important resistance mechanism testing
 - Extended-spectrum β-lactamase producers (ESBL)
 - Carbapenemase screening
 - Inducible Clindamycin Resistance
 - Metallo-beta-lactamase (MBL)
 - Vancomycin resistance
 - High Level Aminoglycoside Resistance (HLAR)



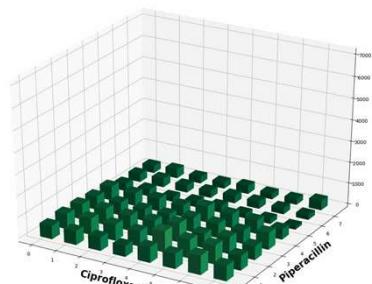
MICs for all antibiotics

Probing for synergies

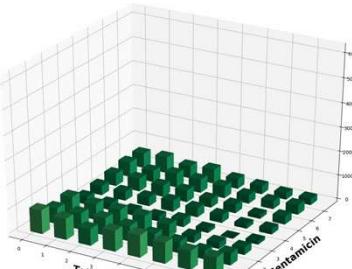
PSEUDOMONAS AERUGINOSA



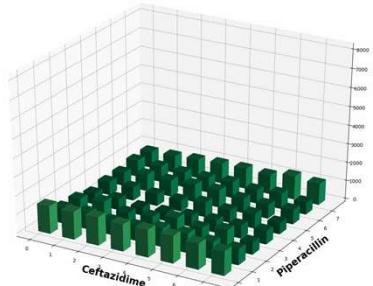
CIP-TMP No Effect



CIP-PIP Synergy FIC=0,5

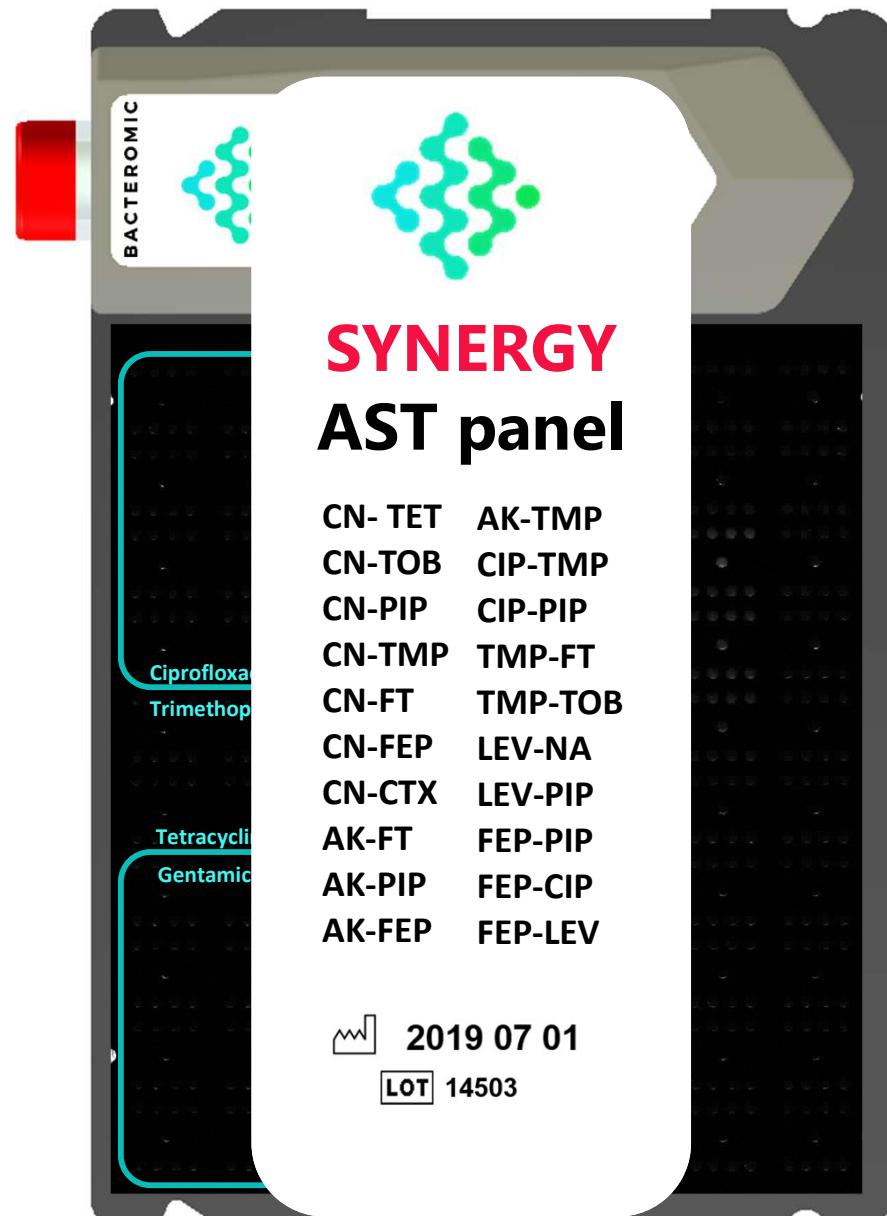


TMP-FT No Effect



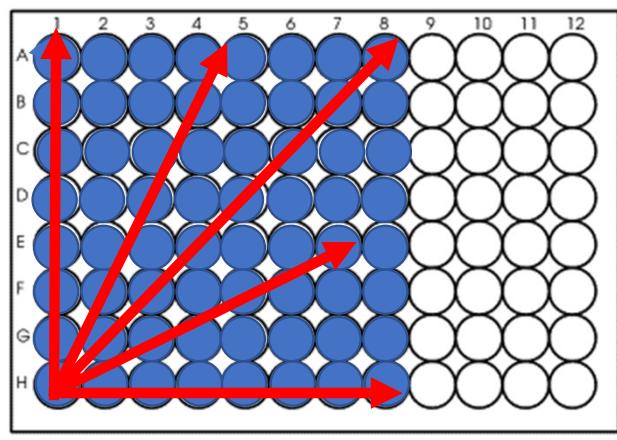
TET-CN Synergy FIC=0,4

CAZ-PIP Synergy FIC=0,4



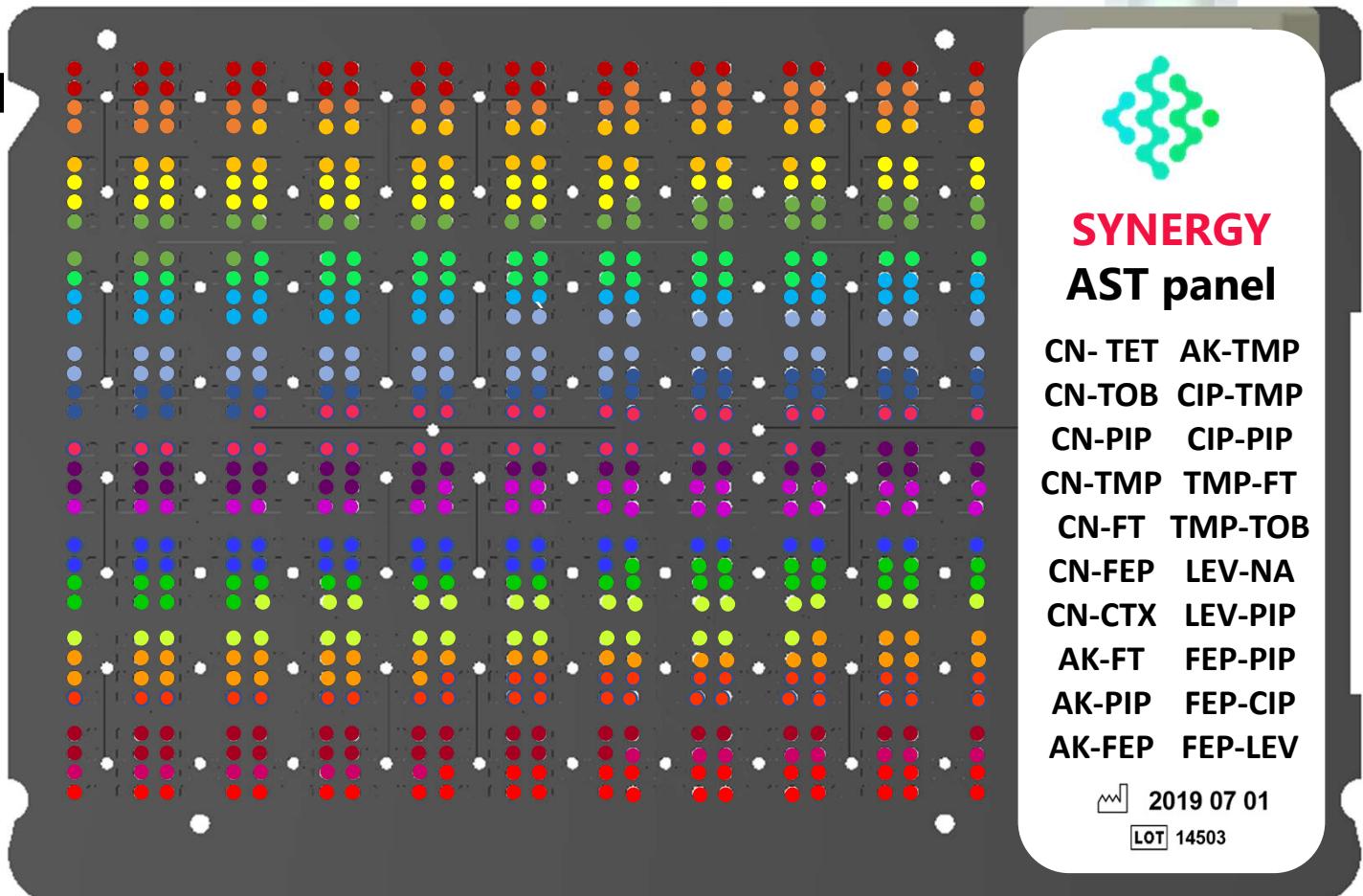
Smart synergy panel – 20 antibiotic pairs on single test

Ray analysis implemented



Panel summary:

- 12 antibiotics
- 20 pairs
- 44 wells per antibiotic pair (27 with antibiotic pairs; 17 with single antibiotic AST)





UNIVERSAL AST panel

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

39 antibiotics evaluated on reference

E.coli ATCC 25922 and/or *S.gureus* ATCC 29213

| Antibiotic | QC agreement | Antibiotic | QC agreement |
|-----------------------------|--------------|--------------------------------|--------------|
| 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% | Norfloxacin | 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 - calavulanic acid | 100% |
| Ceftazidime | 100% | Tobramycin | 100% |
| Ceftriaxone | 100% | Trimethoprim | 100% |
| Cefuroxime | 100% | TrimethoprIm-sulfamethoxazole | 100% |
| Ciprofloxacin | 95% | Vancomycin | 100% |
| Clarithromycin | 100% | | |

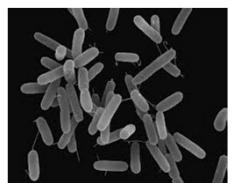
Prevalidation studies



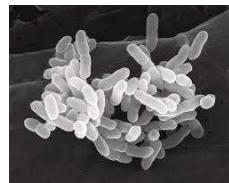
Klebsiella pneumoniae



Escherichia coli



Pseudomonas aeruginosa



Proteus mirabilis



Acinetobacter baumannii

| Antibiotic | Abreviation | EA% |
|-------------------------------|-------------|------|
| Ampicillin | AMP | 100% |
| Aztreonam | ATM | 90% |
| Cefepime | FEP | 100% |
| Cefoxitin | FOX | 91% |
| Cefuroxime | CXM | 98% |
| Cephalothin | CF | 98% |
| Ciprofloxacin | CIP | 100% |
| Gentamicin | CN | 99% |
| Levofloxacin | LEV | 95% |
| Nitrofurantoin | FT | 98% |
| Norfloxacin | NOR | 97% |
| Piperacillin | PIP | 95% |
| Piperacillin-tazobactam | TZP | 90% |
| Trimethoprim | TMP | 100% |
| Trimethoprim-sulfamethoxazole | SXT | 98% |



Team



Advisory Board



Sarai Kemp
Business Advisor



Vincent Linder, PhD
Design Development Advisor



David Wareham, PhD MD
Medical Advisor



Agnieszka Sulikowska, PhD MD
Medical Advisor

Bacteromic is accelerated by



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CE IVD 2021

Semifinalist

AACC

**Disruptive
Technology Award**

**Fastest access to
actionable information
for targeted antibiotic therapies**

- ▶ all antibiotics quantitatively
- ▶ first to test combinations

Minimum entry barrier

- ▶ same price
- ▶ same workflow
- ▶ analyzer rented for „1 dollar“