KAIROS: Setting a new standard of care in bacterial infection management

"Antibiotic resistance is one of the top 10 global health threats facing humanity today"[1], WHO

Room for improvement in the current standard of care in bacterial infection management

Patient with symptoms → Doctor gives a first line antibiotic and requests AST → Lab AST results available >2 days → Doctor changes antibiotic treatment

- **>28%** Prescribed antibiotics are unnecessary[2]
- **20%** Fluoroquinolone prescriptions are not the recommended first-line treatment[3]
- **$2.8bn** Hospitalization costs due to outpatient UTIs alone[4]

Dr. Sophia E. Shanko
CEO

"With KAIROS all healthcare professionals can reliably **diagnose** (Dx) a bacterial infection and enable **correct, first antibiotic** treatment (AST) at the point of care."

Current AST takes time, requires a lab and a trained technician

Patient sample to lab	Sample prepared for testing	Sample ready for AST testing	Sample ready for reporting
1 to 5 days	12-18 hours	12-18 hours	1-2 hours
Sample transfer	Identification	AST	Report

>2 to 7 days

Our KAIROS platform

[1] World Health Organization, Antimicrobial Resistance
[2] Center for Disease Control and Prevention, Antibiotic Prescribing and Use
[3] Kabbani S. et al Clinical Infectious Diseases, 2018
[4] Simmering JE et al., Open Forum Infect Dis., 2017

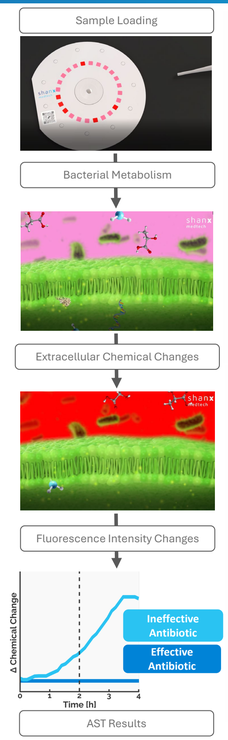
FLORA™: Real-Time Bacterial Metabolism Monitoring Technology

All living bacteria constantly interact and communicate with their environment through the exchange of molecules between the bacterial cell and their surroundings. This ongoing molecular exchange alters the chemical composition of the extracellular environment over time.

FLORA™ is a proprietary chemical composition featuring two distinct component groups: our innovative Enriched Nutrient Formulation, which activates specific metabolic pathways to accelerate pathogen metabolism and our novel fluorescent chemical sensors, which track extracellular chemical changes resulting from these metabolic activities.

With FLORA™, we can monitor over twenty environmental parameters both in the absence and presence of a wide range of antimicrobial agents, addressing two critical questions:

1. Are there metabolizing pathogens present? And
2. What is their antimicrobial resistance and susceptibility?



KAIROS: Direct-from-sample Dx/AST in as fast as 1 hour and at the point of care

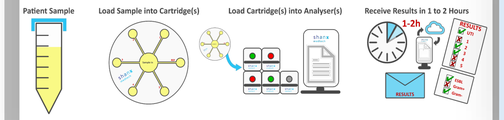
KAIROS is a three-part system based on the proprietary FLORA™ technology: (1) a one-time-use cartridge and (2) a photonic analyzer with an advanced algorithm and (3) the controlling unit.

1	2	3
Weight: 10 g (0.02 lb)	Weight: <2 kg (4.4 lb)	Weight: <700 g (<1.5 lb)
Dimensions: Ø9 cm (3.4 in)	Dimensions: 15 x 15 x 15 cm (5.9 x 5.9 x 5.9 in)	Dimensions: 25 x 19 x 0.75 cm (9.4 x 7.5 x 0.29 in)

An easy-to-use system

Seconds in hands-on-time and directly on patient sample.

No sample preparation, pre-incubation or other instrumentation (incl. a lab and expertise) are required to perform the test.



KAIROS special features

- Time-to-result in as fast as 1 hour
- Directly from sample
- Test applicable to a broad spectrum of pathogens
- Minimizing hands-on time to seconds
- Small size to fit everywhere
- Digitally enabled to support surveillance of AMR

A platform technology applicable for…

PIPELINE

Urinary Tract Infections	Advanced clinical
Wound infections	Early clinical
Positive blood cultures	Pre-clinical
Pathogen Identification	Proof of concept

KAIROS is a platform device that can provide reliable diagnosis and antibiotic susceptibility testing in as fast as 1 hour and directly from sample. No sample preparation, pre-incubation or other instrumentation (incl. a lab and expertise) are required to perform the test making it excellent for the point of care but also limited resource laboratories.

Clinical study results for Dx/AST of Urinary Tract Infections from hospital patient urine samples

Hospital Urine Samples = 144

UTI Positive = 105

UTI Negative= 39

Urine: No pre-culture or sample preparation, no patient data provided or collected.

METC: MEC-2023-0379

Bacterial Species Tested

- *E. coli*
- *K. pneumonia*
- *P. mirabilis*
- *E. faecalis*
- *Strep. agalactiae*
- *S. aureus*
- *K. oxytoca*
- *K. aerogenes*
- *C. koseri*
- *E. faecium*
- *S. marcescens*

Diagnosis (Dx) >99%

Antibiotic Susceptibility (AST) 88.8%

AST (n=17) Polymicrobial samples 91.0%

AST COMPARISON TO VITEK2 (bioMérieux)

Results from comparative analysis of KAIROS against Gold-Standard culture and AST method (VITEK2).

All KAIROS tests were conducted directly on patient urine samples, with no prior culture or incubation.

Data indicates number of instances wherein KAIROS AST results matched with Gold-Standard Diagnostic Result for *E. coli* and *K. pneumoniae* infections.

Species (n)	*E. coli* (63)		*K. pneumoniae* (21)		Sub-total		Total
VITEK®2 Result:	S	R	S	R	S	R	
amoxicillin	26/30 86.7 %	33/33 100 %	0/0	21/21 100 %	26/30 86.7 %	54/54 100 %	80/84 95.2 %
cotrimoxazole	19/22 86.4 %	14/14 100 %	3/3 100 %	2/2 100 %	22/25 88.0 %	16/16 100 %	38/41 92.7 %
ciprofloxacin	27/39 69.2 %	19/20 95.0 %	6/10 60.0 %	11/11 100 %	33/49 67.3 %	30/31 96.8 %	63/80 78.8 %
Amoxicillin/ clavulanic acid	32/39 82.1 %	23/24 95.8 %	9/13 69.2 %	8/8 100 %	41/52 78.8 %	31/32 96.9 %	72/84 85.7 %
fosfomycin	61/63 96.8 %	0/0	7/11 63.6 %	8/10 80.0 %	68/74 91.9 %	8/10 80.0 %	76/84 90.5 %
nitrofurantoin	60/61 98.4 %	2/2 100 %	0/0	0/0	60/61 98.4 %	2/2 100 %	62/63 98.4 %
trimethoprim	34/39 87.2 %	24/24 100 %	7/7 100 %	13/14 92.9 %	41/46 89.1 %	37/38 97.4 %	78/84 92.9 %
Sub-total	259/293 88.4 %	115/117 98.3 %	32/44 72.7 %	63/66 95.5 %	291/337 86.4 %	178/183 97.3 %	
Total	374/410 91.2 %		95/110 86.4 %			Overall:	469/520 90.2 %