



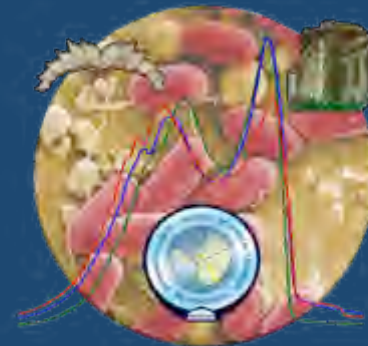
“Carol



“Ilie Murgulescu”



“Marius Nasta”



The BioCalorimetry Laboratory of the Romanian Academy's Institute of Physical Chemistry Bucharest

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Corneliu Iftene
Ioana Tofolean

Background

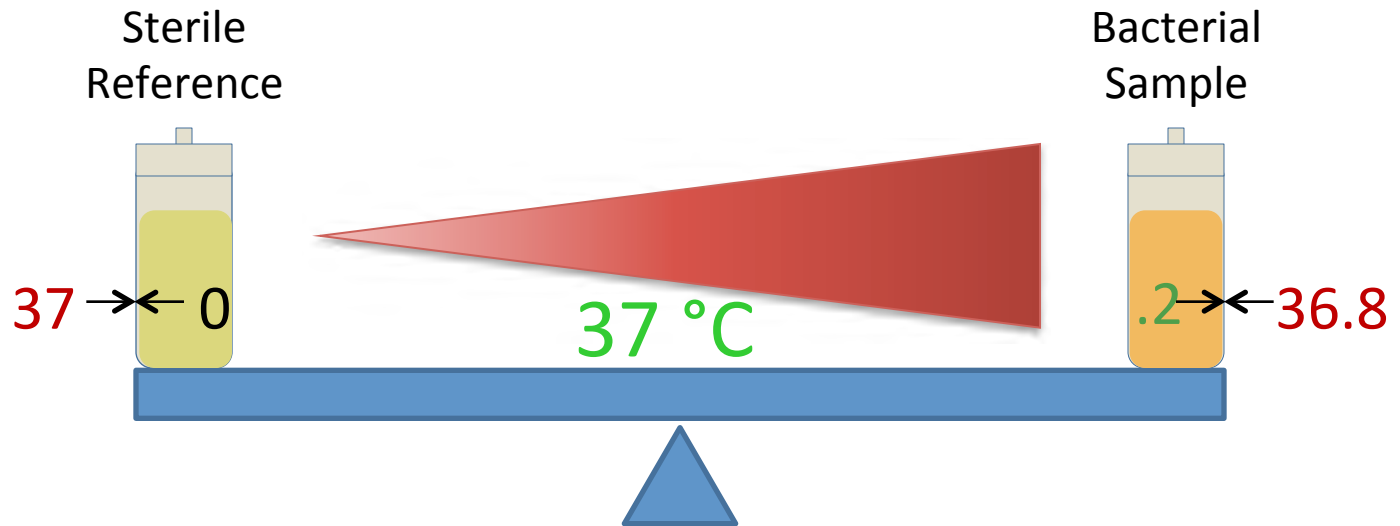
- Microcalorimetric study of bacterial growth:
 - Only live, metabolically active bacteria are proven to generate heat (as opposed to turbidity)
 - Real time analysis
 - High sensitivity and early growth detection time
 - Results are reproducible and predictable
 - There is a great need for obtaining drug-susceptibility information as quickly as possible

Materials and Methods

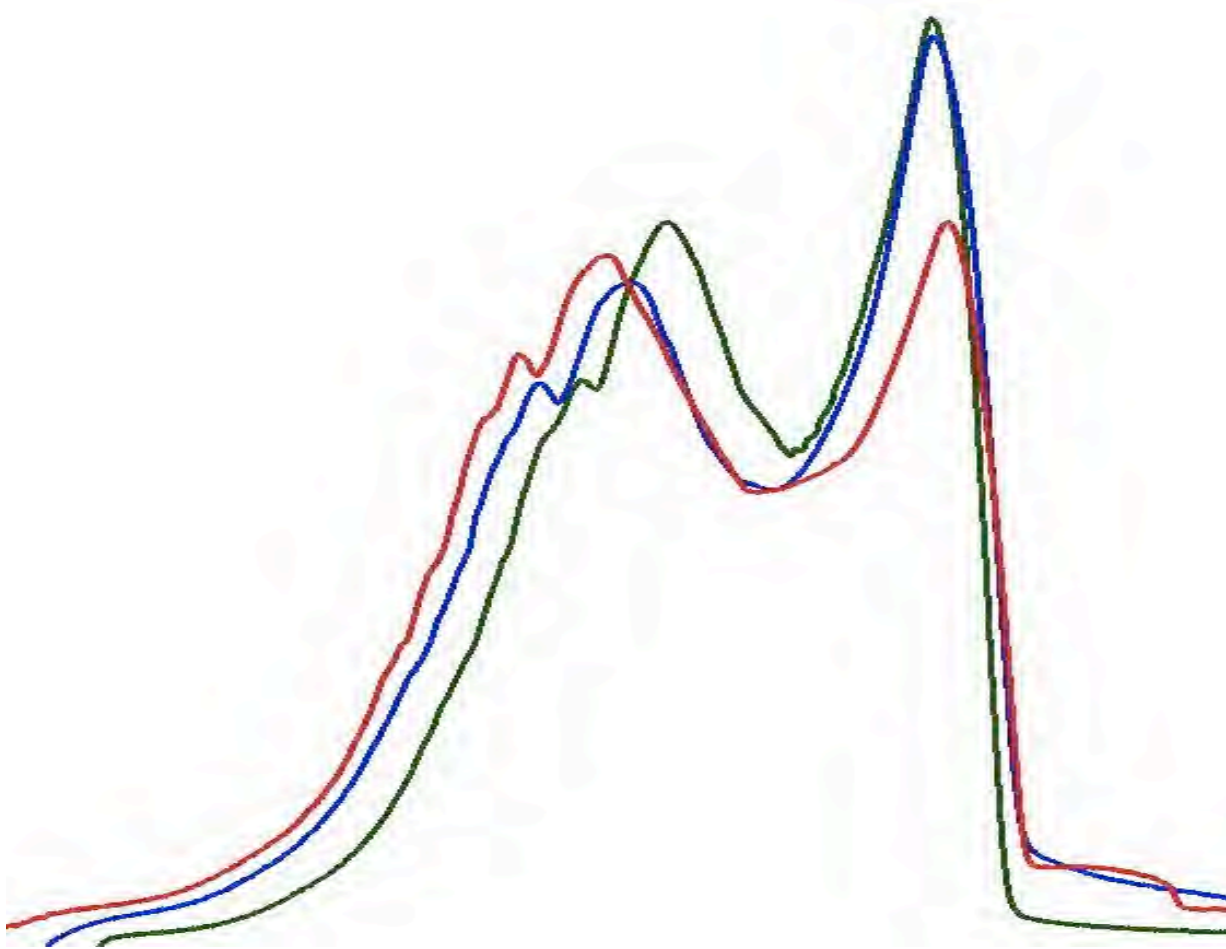
- *Staphylococcus aureus* ATCC 25923
- *Escherichia coli* ATCC 25922
- Tryptone Soy Agar/Broth (TSA, TSB)
- Setaram MicroDSC III
- Setaram MicroDSC VII Evo

Heatflow (1)

Why Heatflow ? .. and not heat ?

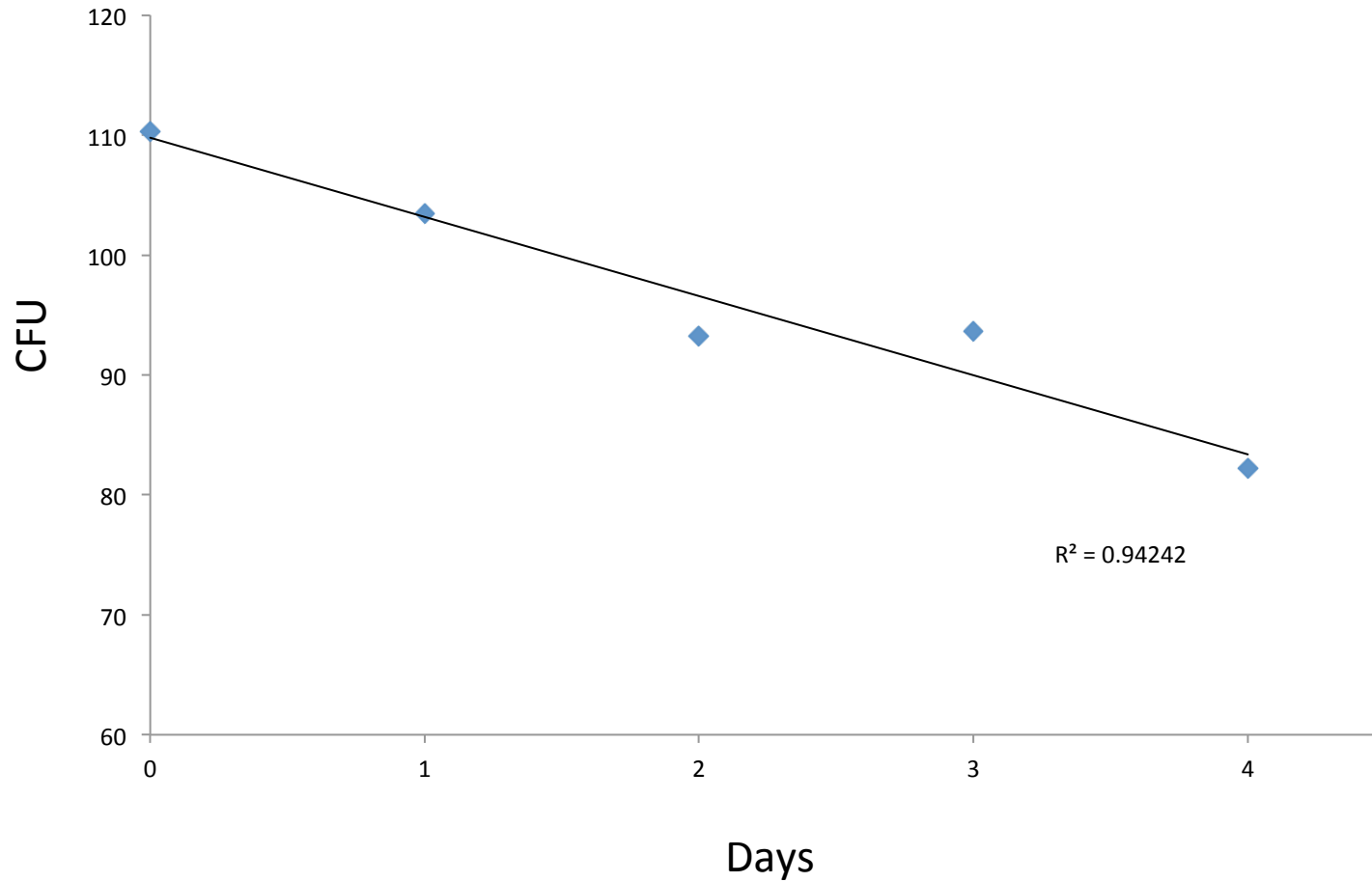


Anatomy of an E. coli growth curve

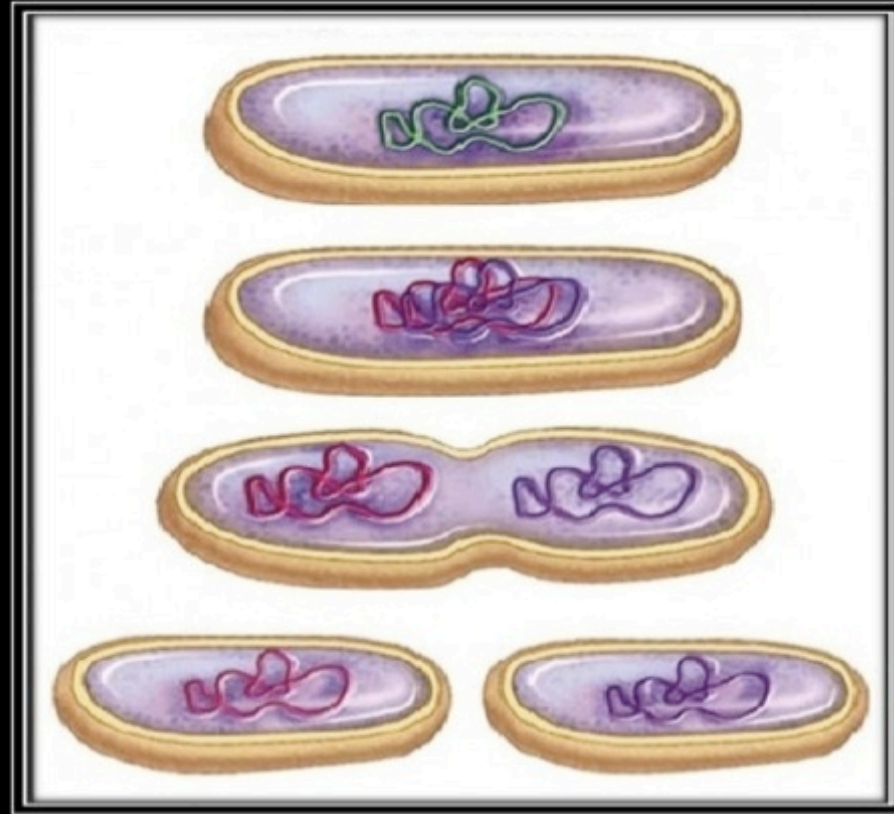


053, 055, 057 – one day apart each

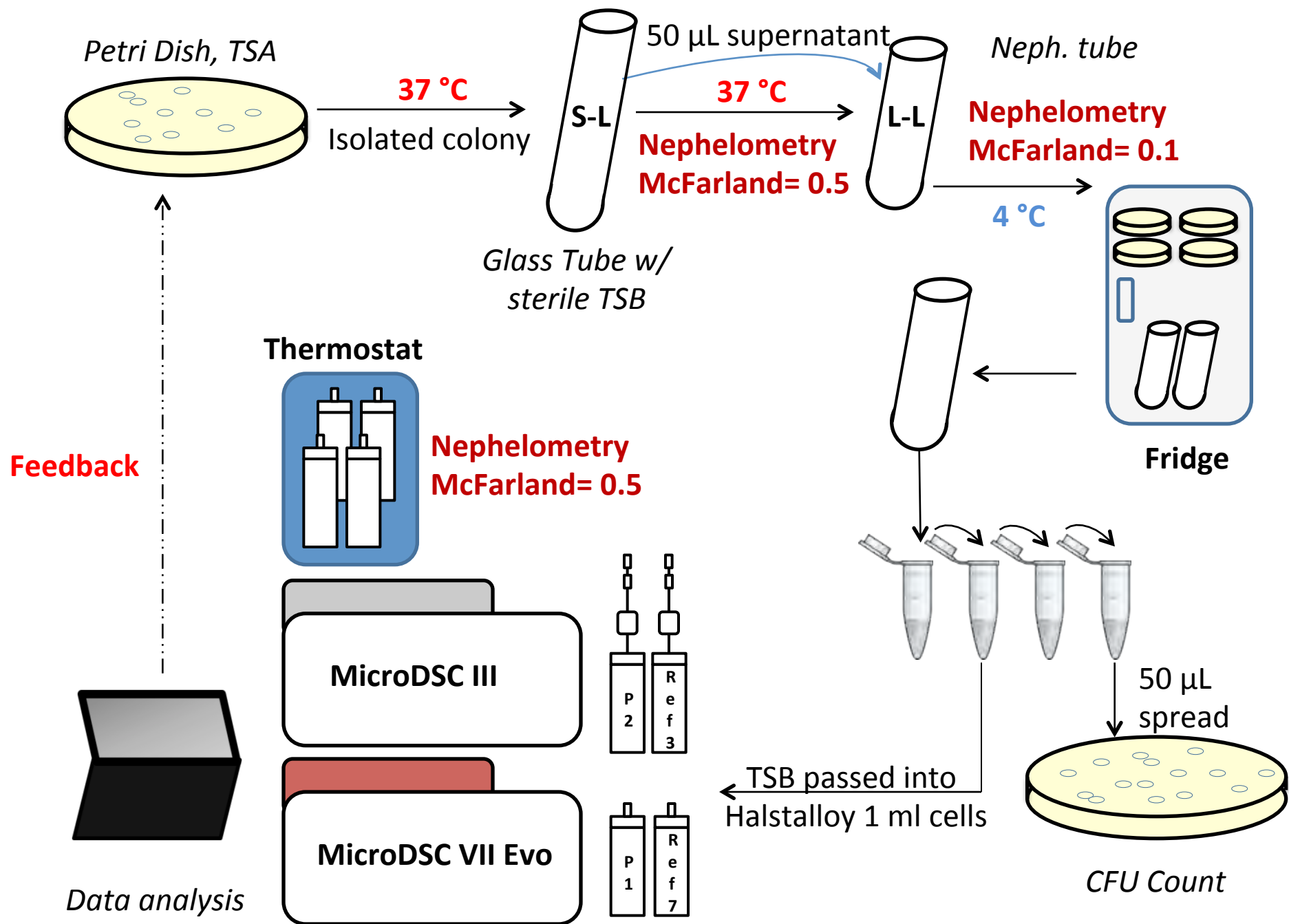
Time from t_0



Bacterial Replication STILL

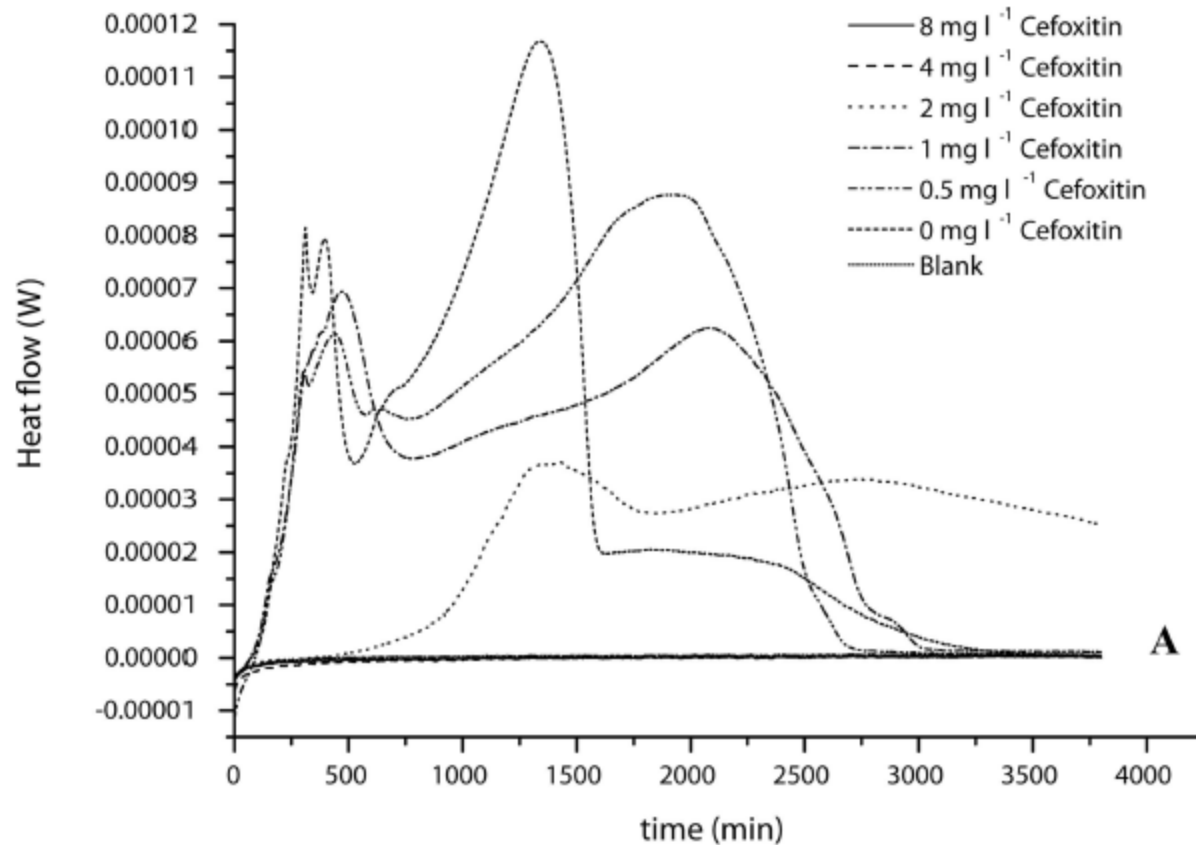


**A BETTER LOVE STORY
THAN TWILIGHT**



Antibiotics – premixing (1)

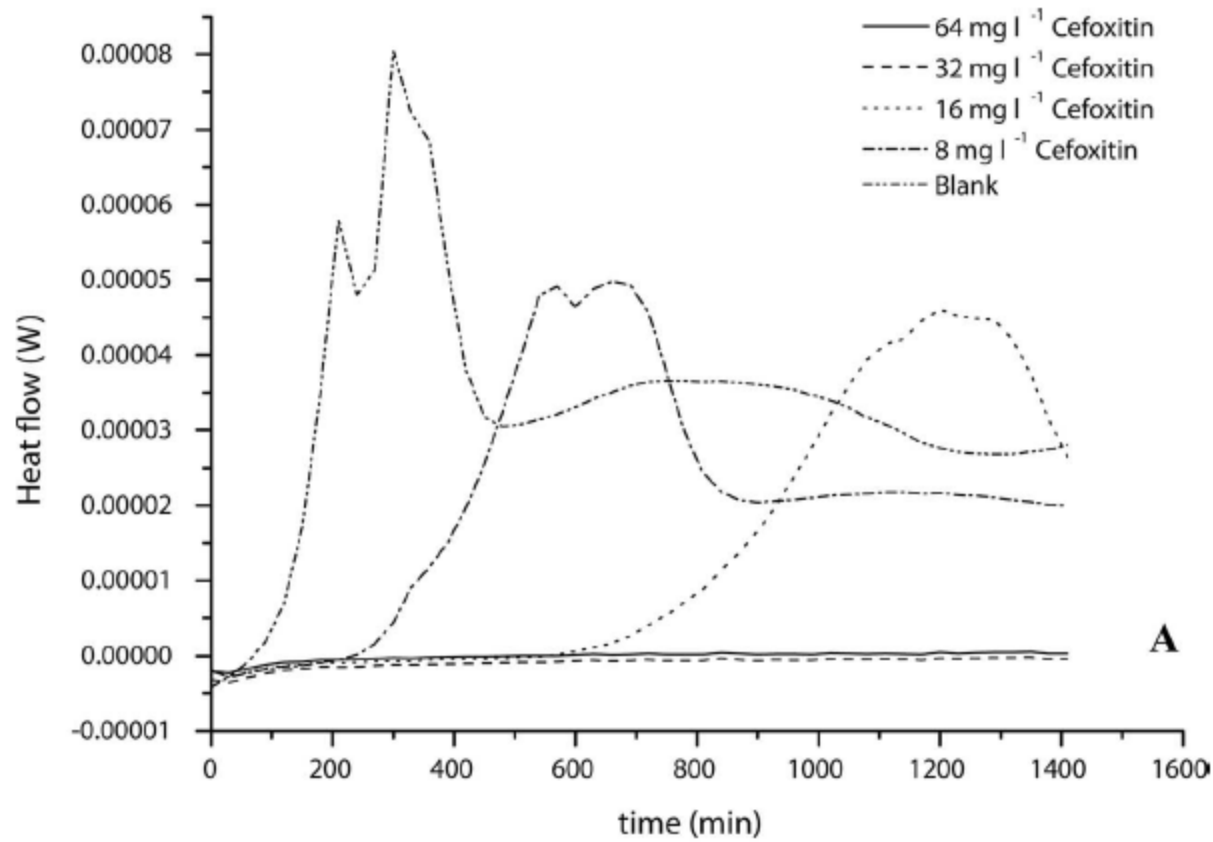
MSSA



- Ueli von Ah, Dieter Wirz, and A. U. Daniels - **Rapid Differentiation of Methicillin-Susceptible *Staphylococcus aureus* from Methicillin-Resistant *S. aureus* and MIC Determinations by Isothermal Microcalorimetry** - JOURNAL OF CLINICAL MICROBIOLOGY, 46(6), 2008

Antibiotics – premixing (2)

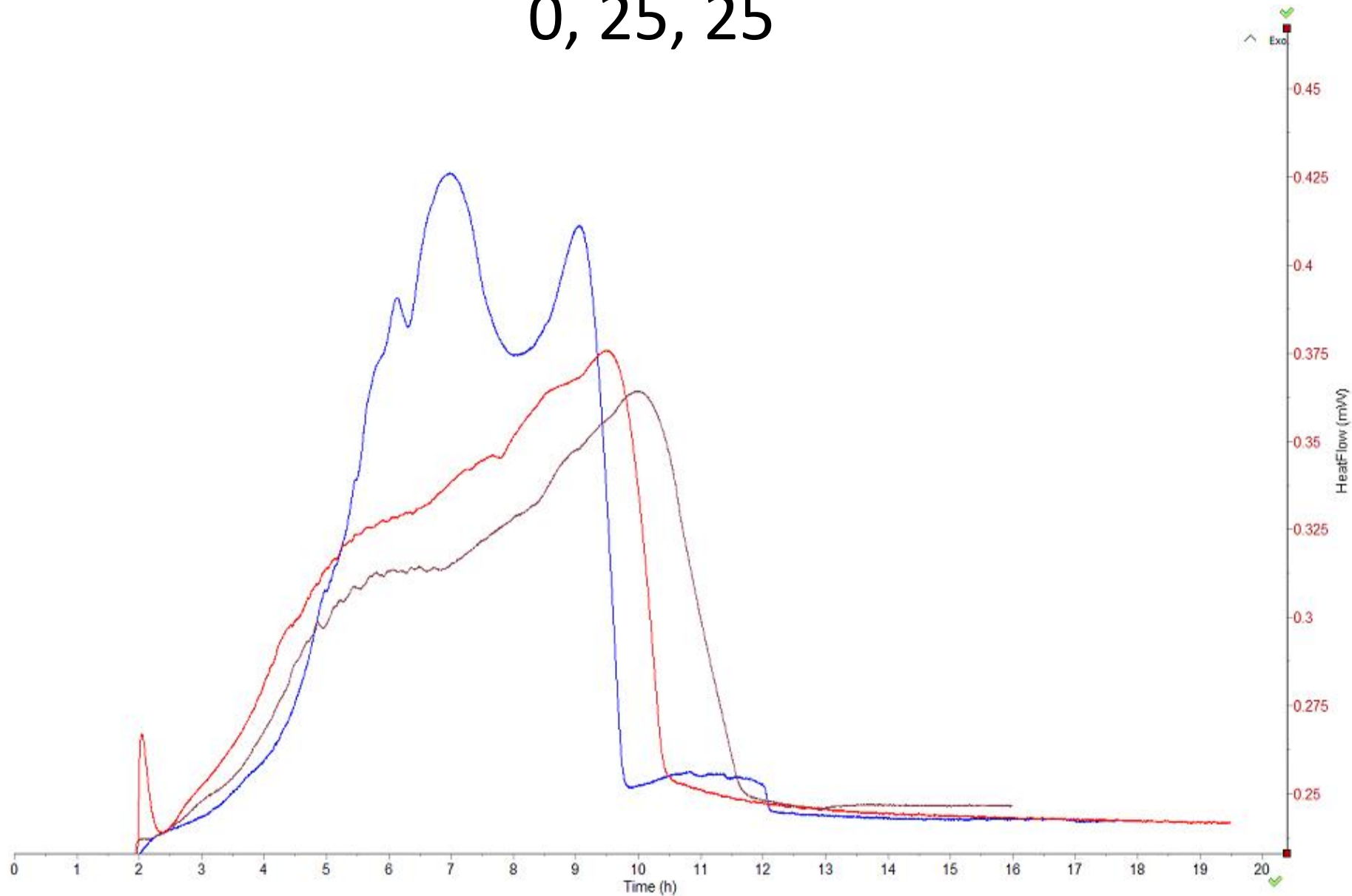
MRSA



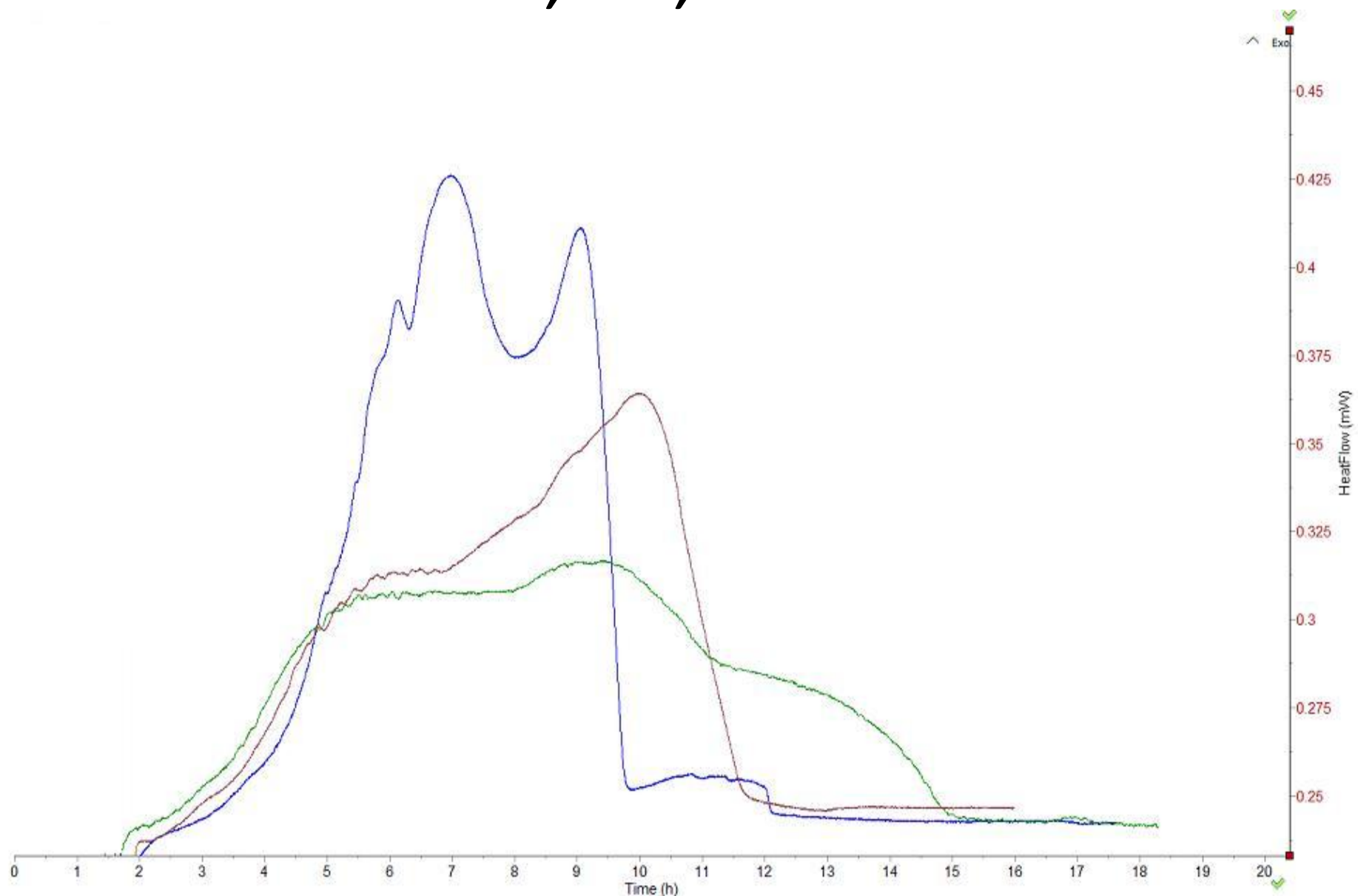
- Ueli von Ah, Dieter Wirz, and A. U. Daniels - **Rapid Differentiation of Methicillin-Susceptible *Staphylococcus aureus* from Methicillin-Resistant *S. aureus* and MIC Determinations by Isothermal Microcalorimetry** - JOURNAL OF CLINICAL MICROBIOLOGY, 46(6), 2008

Metronidazol

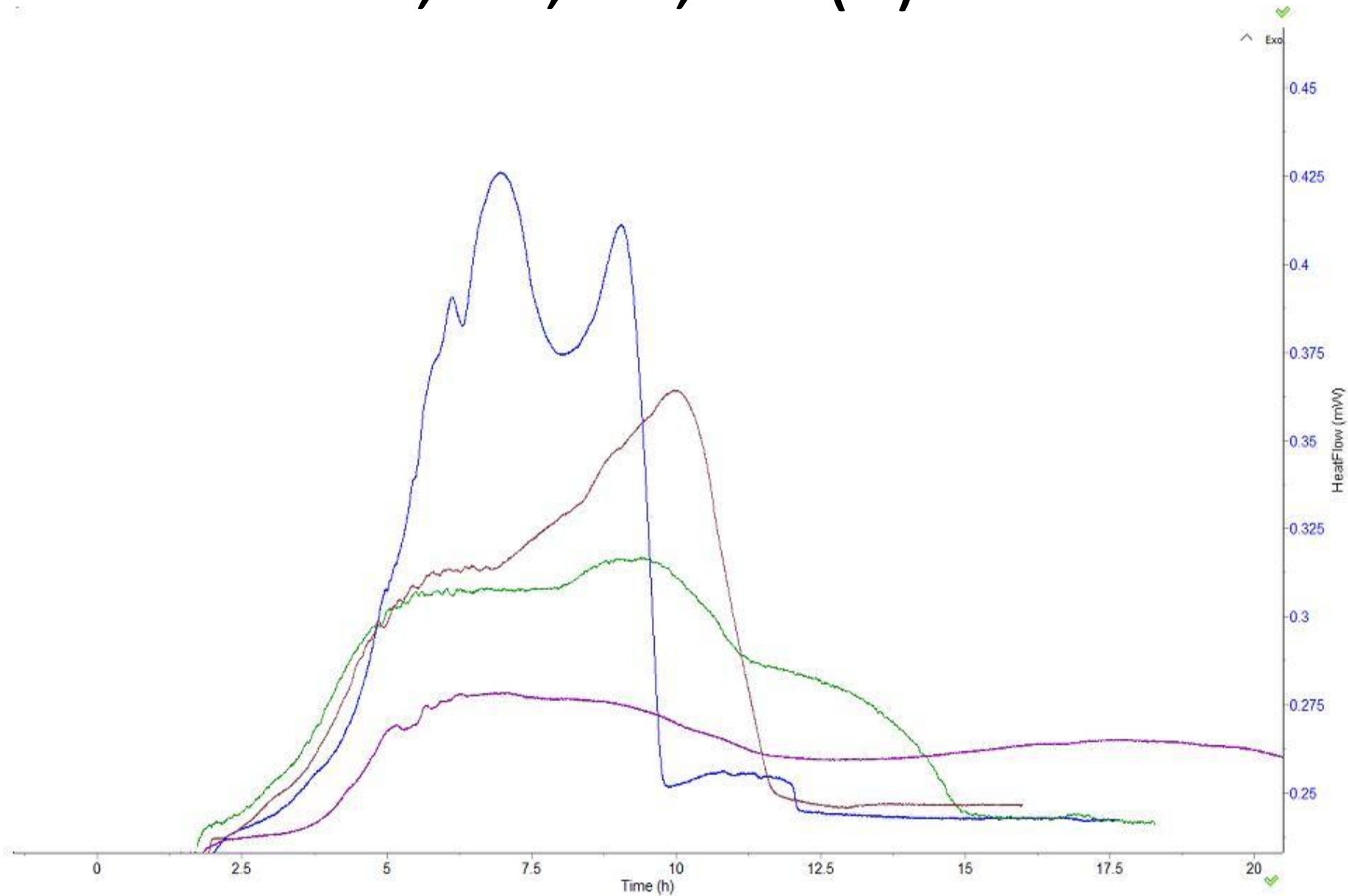
0, 25, 25



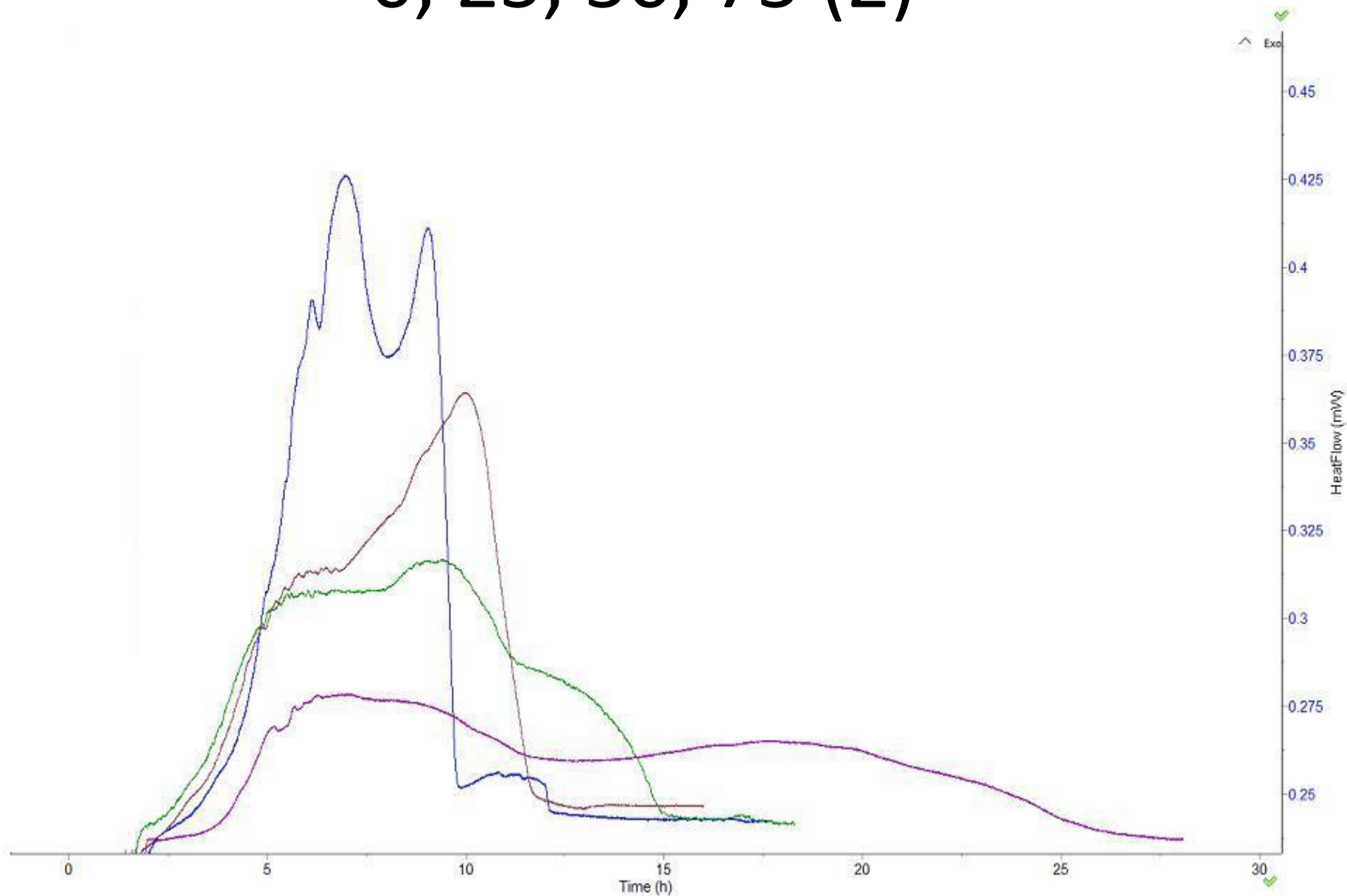
0, 25, 50



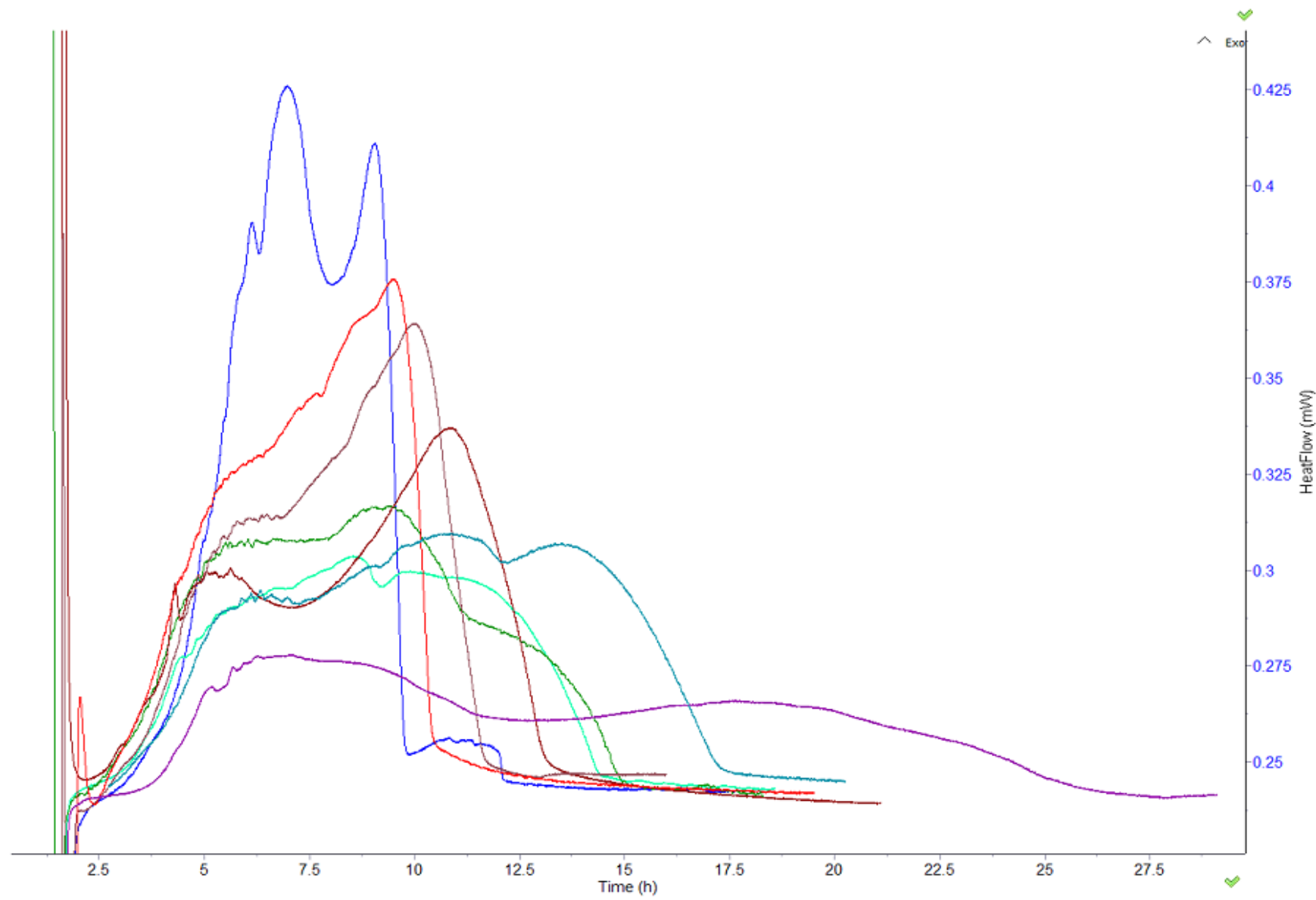
0, 25, 50, 75 (1)



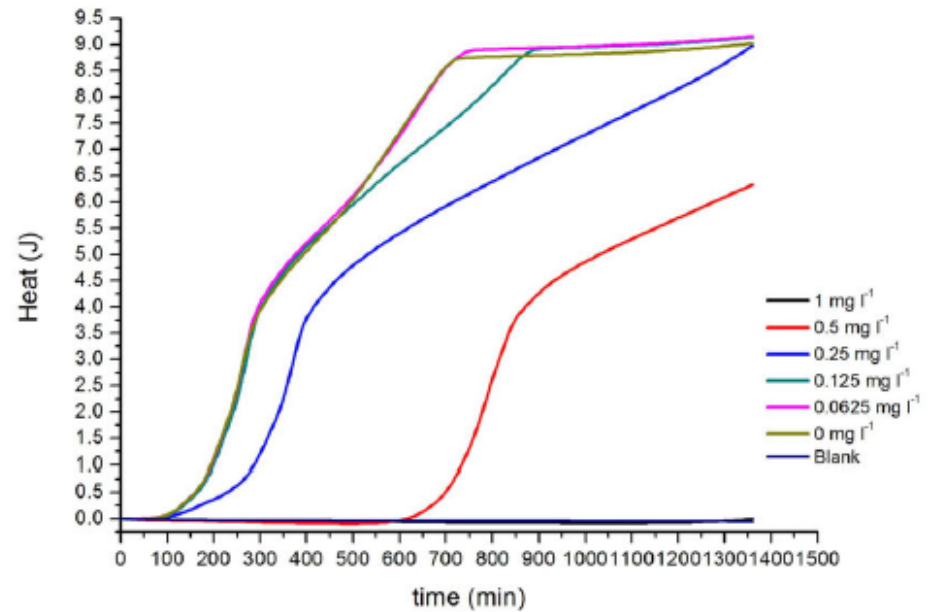
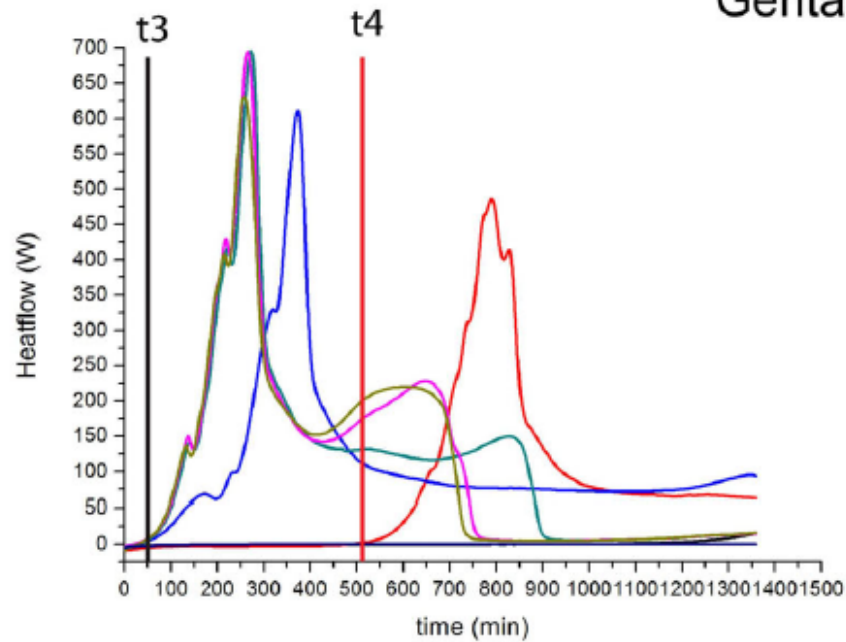
0, 25, 50, 75 (2)

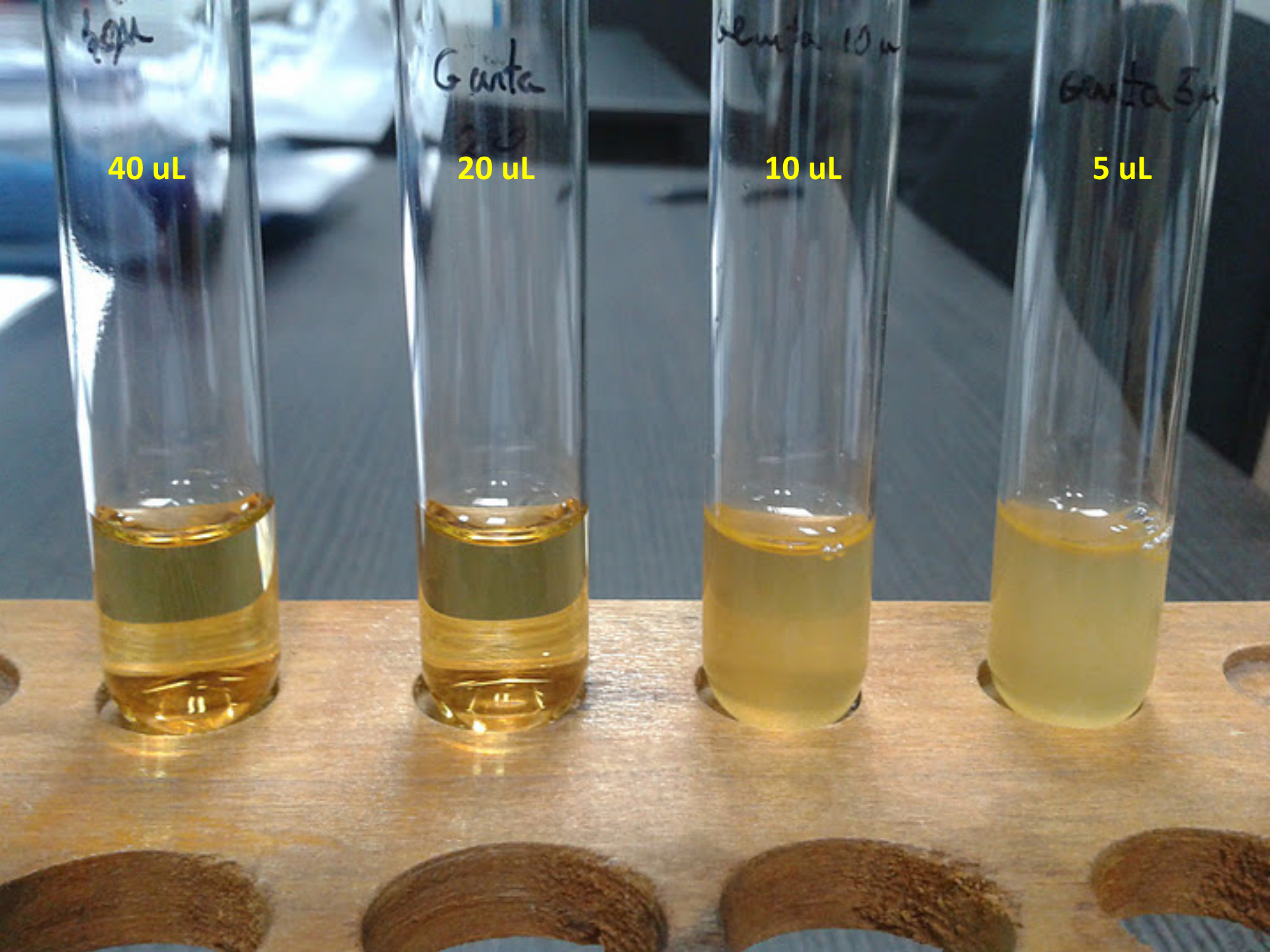


Metronidazol - all



Gentamycin





Ganta
40

40 uL

Ganta
20

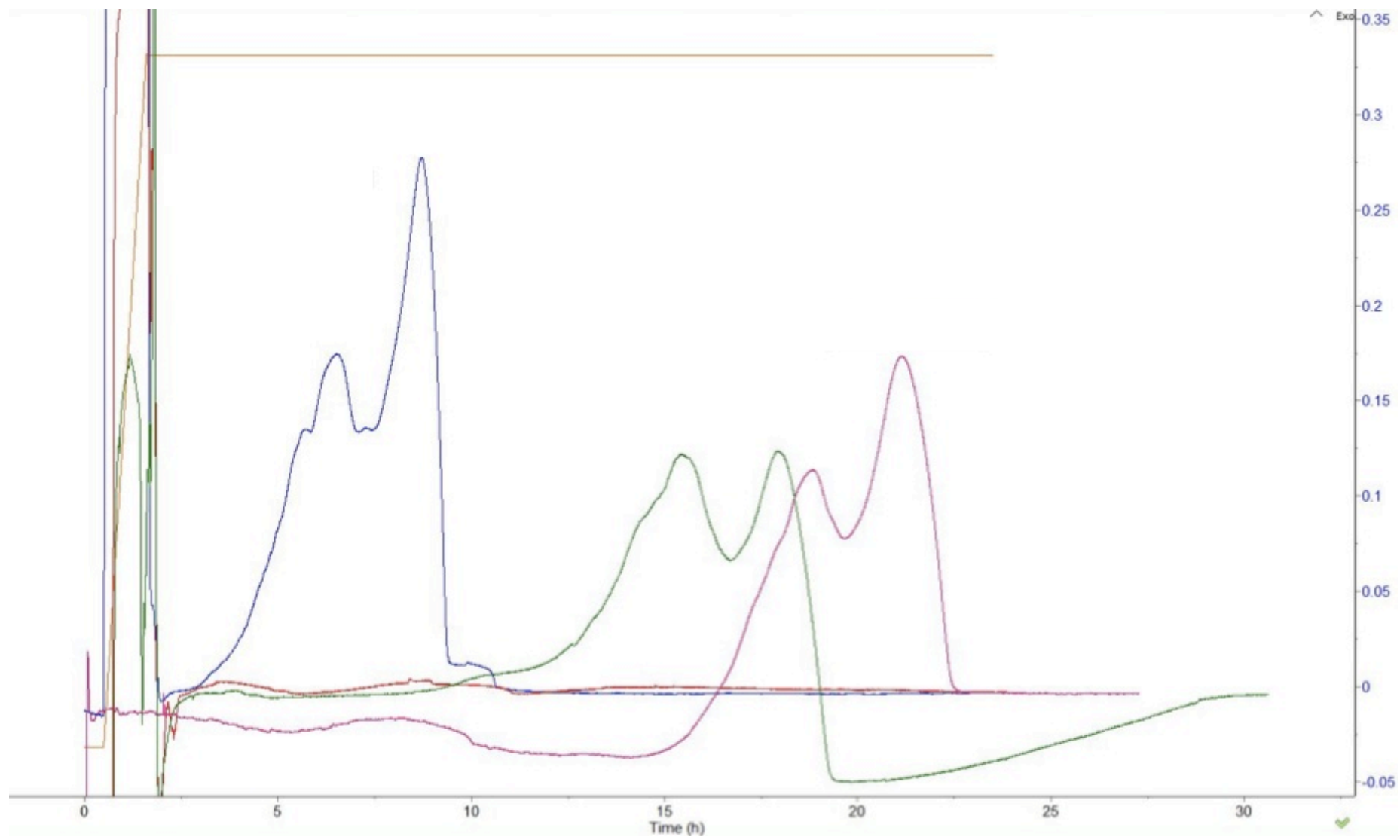
20 uL

Ganta 10 u

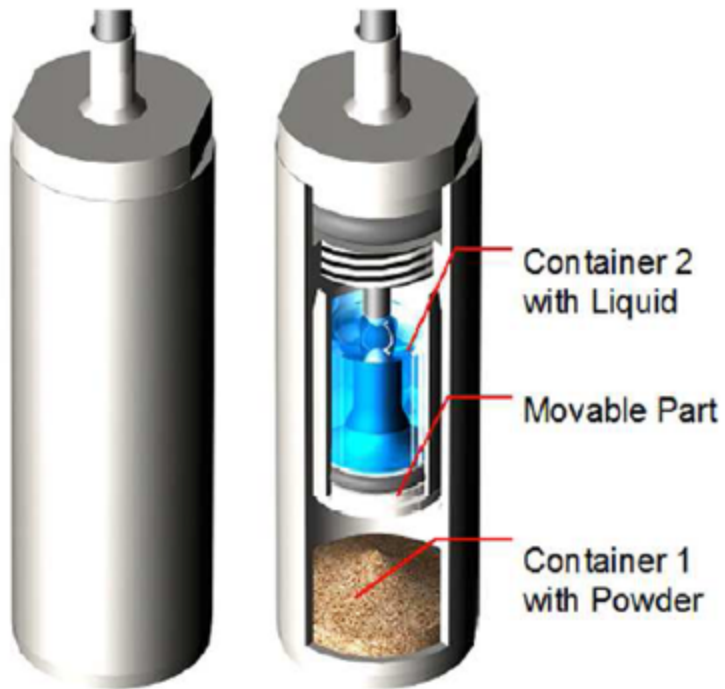
10 uL

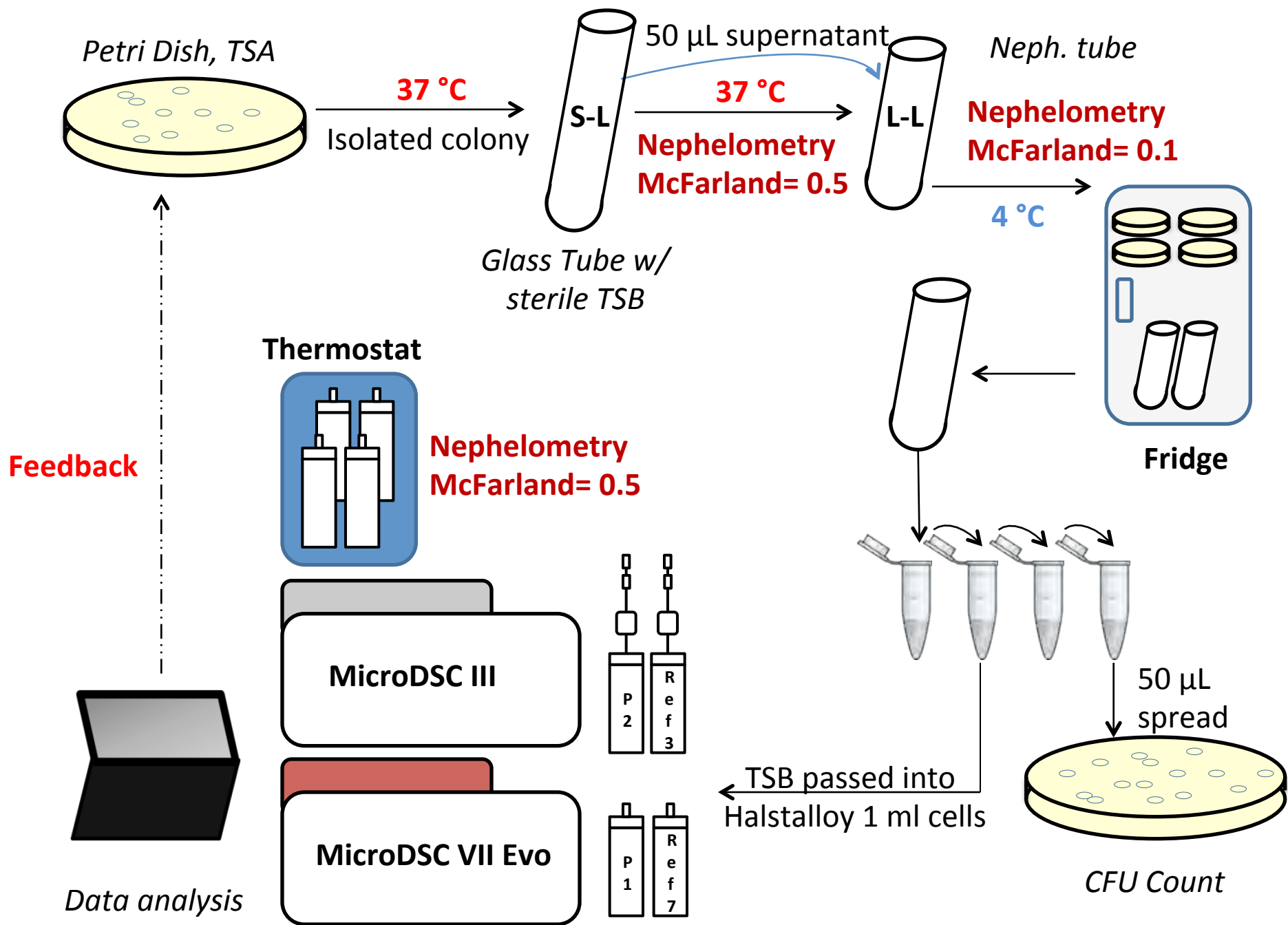
Ganta 5 u

5 uL

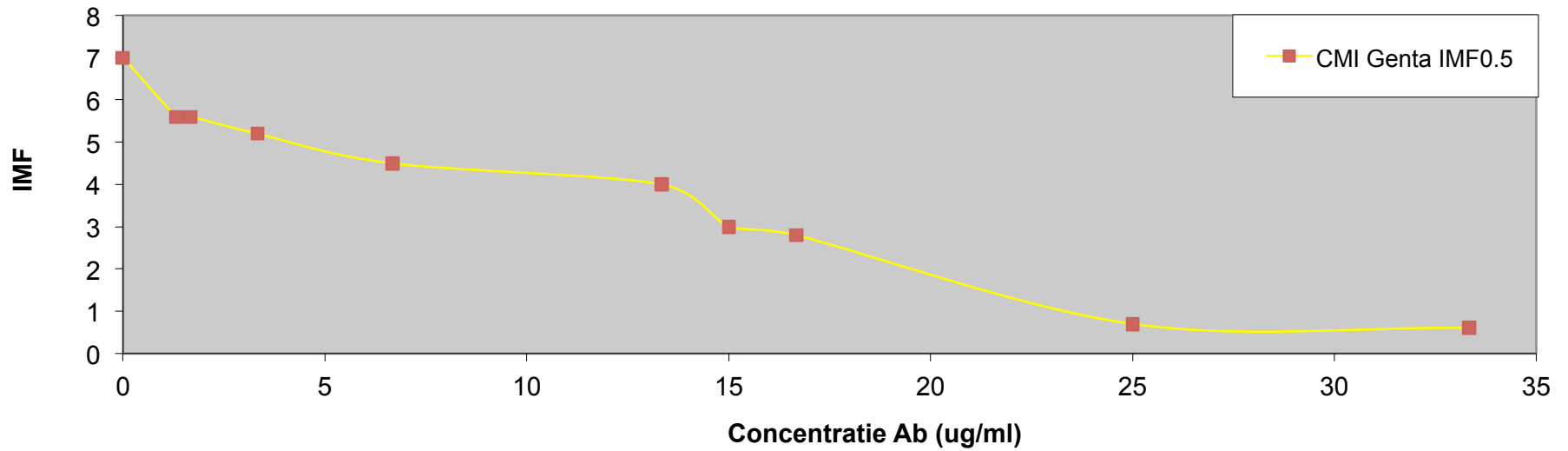


Batch Mixing Cells (BMC)

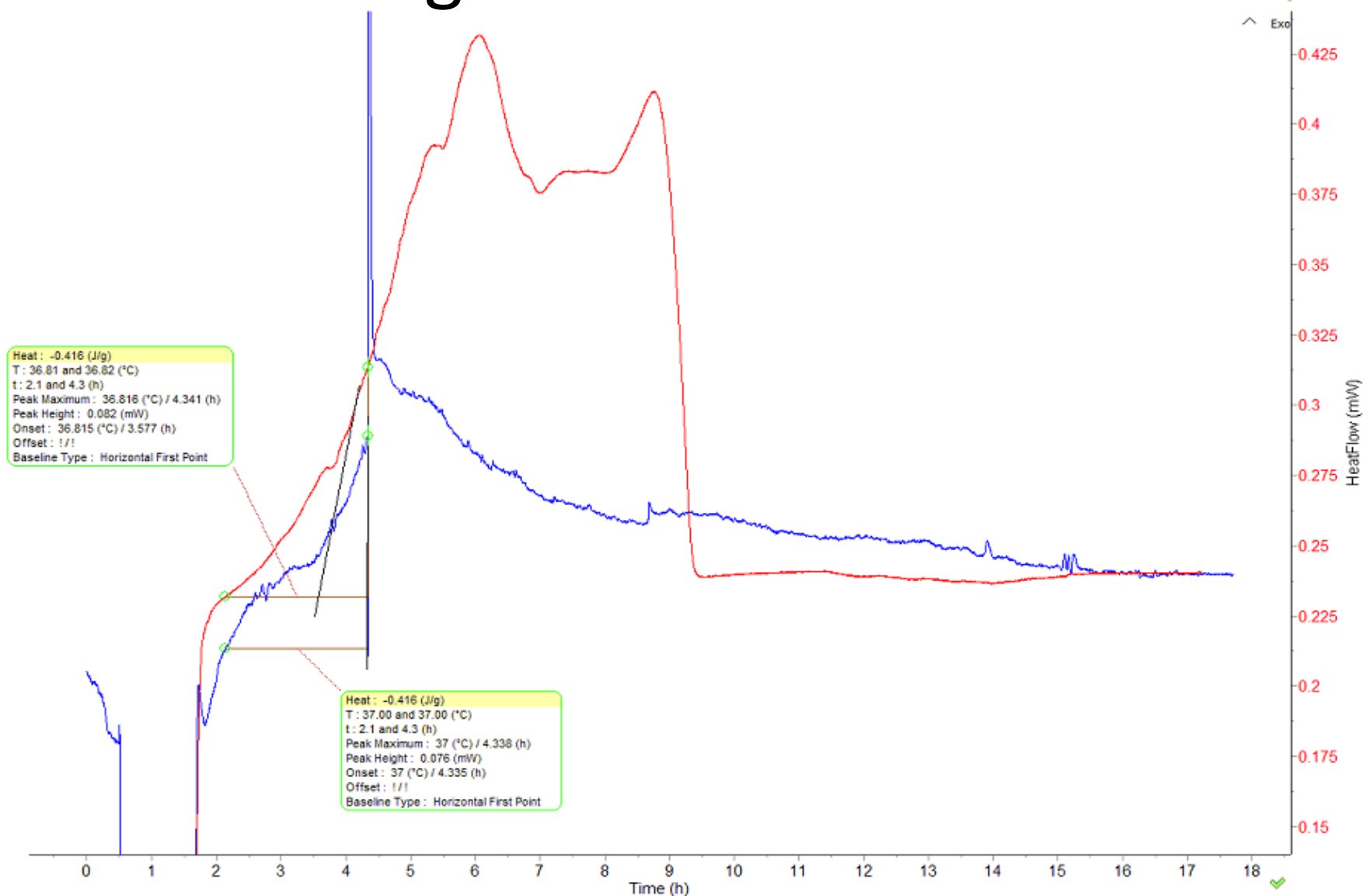


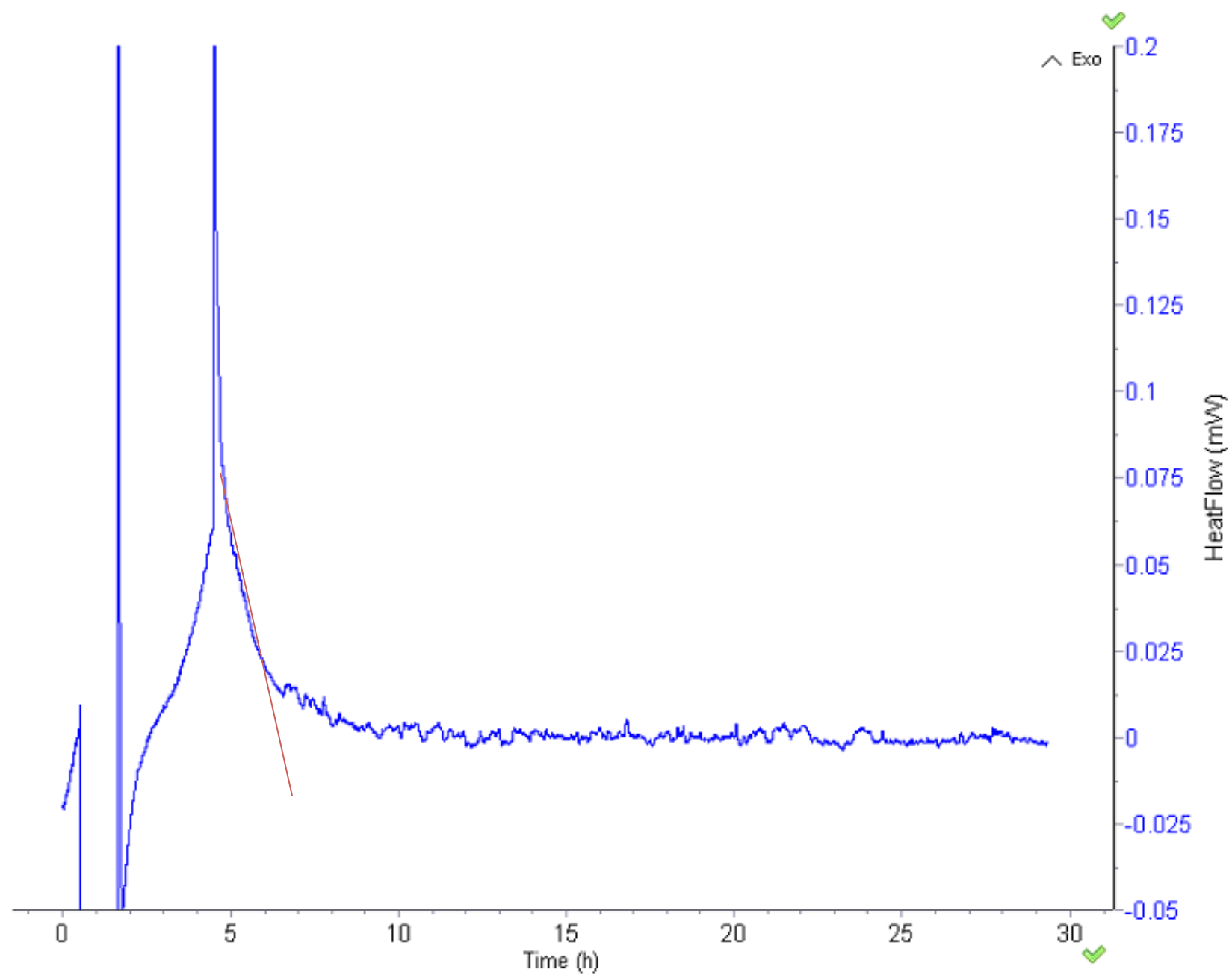


Determinare CMI



Batch Mixing – Gentamicina Ds > MIC





Advantages

- Objectify bacterial growth in the sample eliminating the need to wait 24h.
- Enrich for resistant strains
- Non-destructive – can be checked for viability.

Future Research

- Identify factors that influence bacterial growth
- Identify the calorimetric processes that make up the bacterial growth curve
- Use standard media for rapid bacterial detection
- Use of selective media for rapid bacterial identification
- **Drug-bacteria interaction**
- Evaluating bacteriostatic/bactericidal compounds
- Translational studies
- **Real-time antibiogram**

End of slide show, click to exit.

One more thing..

Grupul Studenților Mediciniști cu
Activitate Științifică

organizează

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16|17

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UMF Carol Davila

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Carol Davila, Oxford, Greifswald, Harvard

Prezentări plenare și workshop-uri
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It **GLOWS** in the **DARK**.



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