

Vuka! Let's unite towards a TB-free world!

9th SA
TB
Conference
8 - 11 June 2026



LC-MS Metabolomics of Cerebrospinal Fluid in Pediatric Tuberculous meningitis

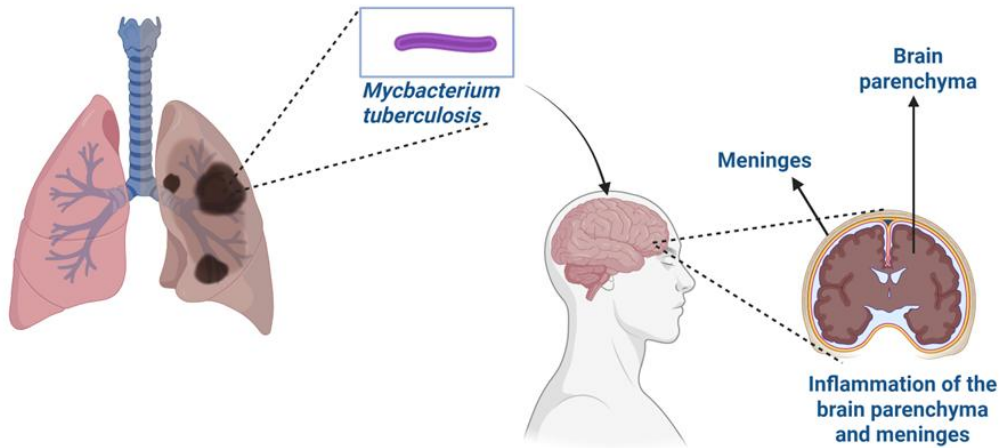
Presentation by Ms Ontefetse Neo Plaatjie

Supervisors:

- Prof Shayne Mason
- Prof A Marceline Tutu van Furth
- Dr Martijn van Kuip

Tuberculous meningitis (TBM)

- Severe form of extrapulmonary tuberculosis
- Pathogenesis of tuberculous meningitis:



- Diagnosis challenge – non specific symptoms (low-grade fever, headache, neck stiffness).

WHO recommended diagnostic tests for TBM



GeneXpert MTB/RIF

- Rapid
- Reduced sensitivity



Mycobacterial culture

- High sensitivity
- Slow (2 – 6 weeks)

Diagnostic biomarkers required - Metabolomics

Aim



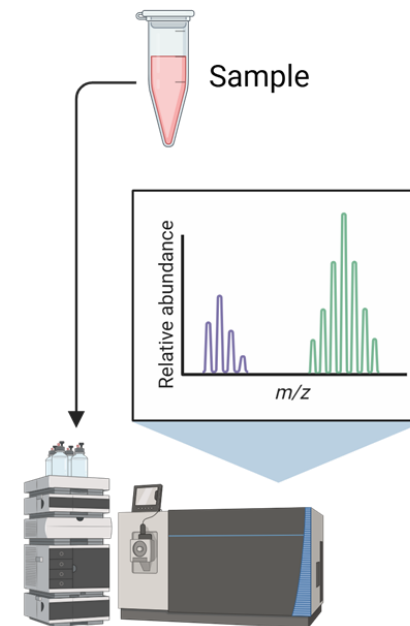
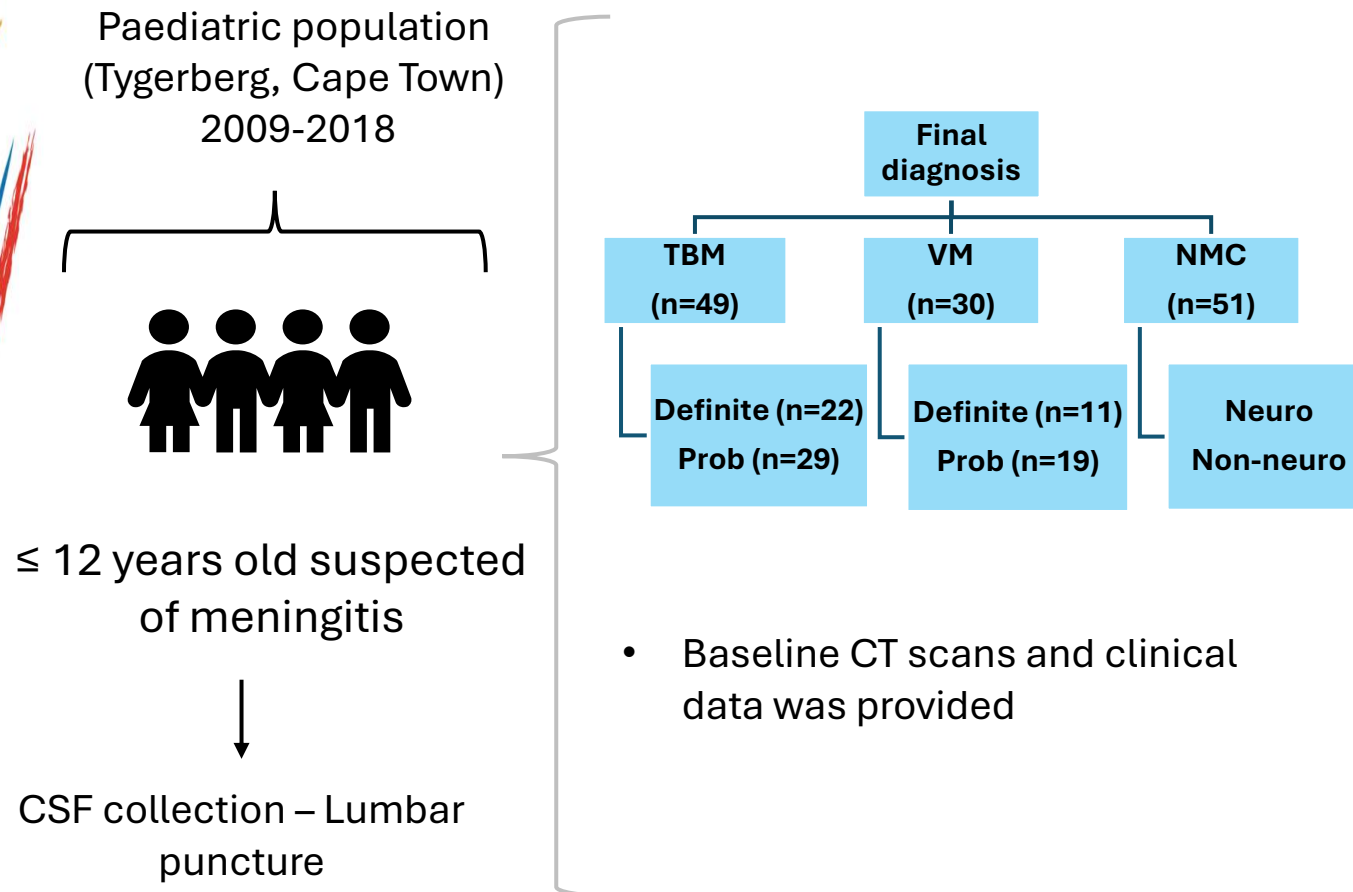
To characterise metabolic alterations associated with TBM
using LC-MS/MS-based CSF metabolomics in order to
identify potential diagnostic biomarkers with a specific
focus to acylcarnitine and tryptophan metabolism.

Methodology

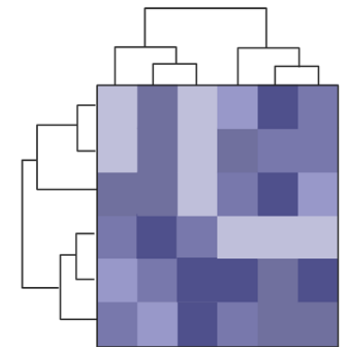
Sample collection

② LC-MS/MS

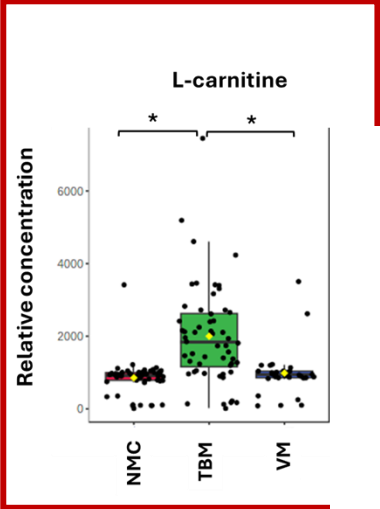
③ Data analysis



Acylcarnitines, tryptophan
metabolism & amino
acids data analysis using
the masshunter qual and
quant software and
metaboanalyst



Results - Acylcarnitine



Acetylcarnitine
*
Propionylcarnitine
*
scientific reports

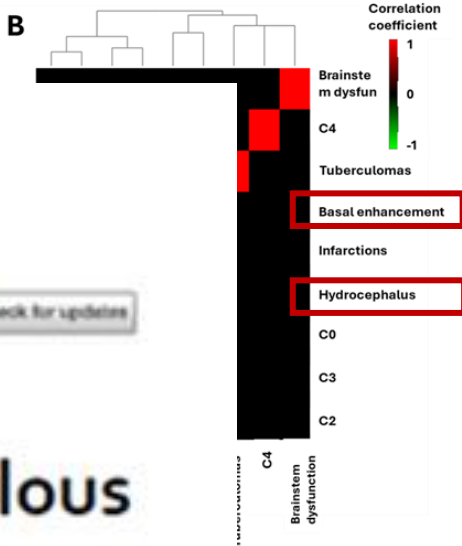
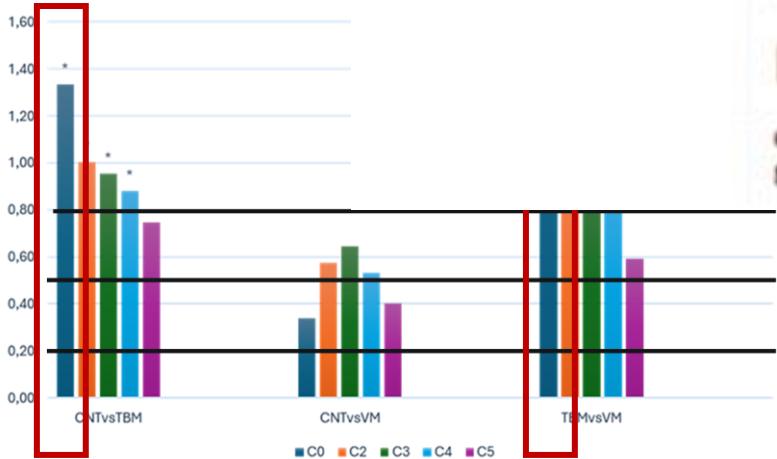
OPEN CSF carnitine is a potential biomarker in paediatric tuberculous meningitis

Ontefetse Neo Plaatjie¹, A. Marceline Tutu van Furth^{1,2}, Regan Solomons³,
Martijn van der Kuip^{2,4} & Shayne Mason^{1,4}

$d = 0.8$ - Large effect

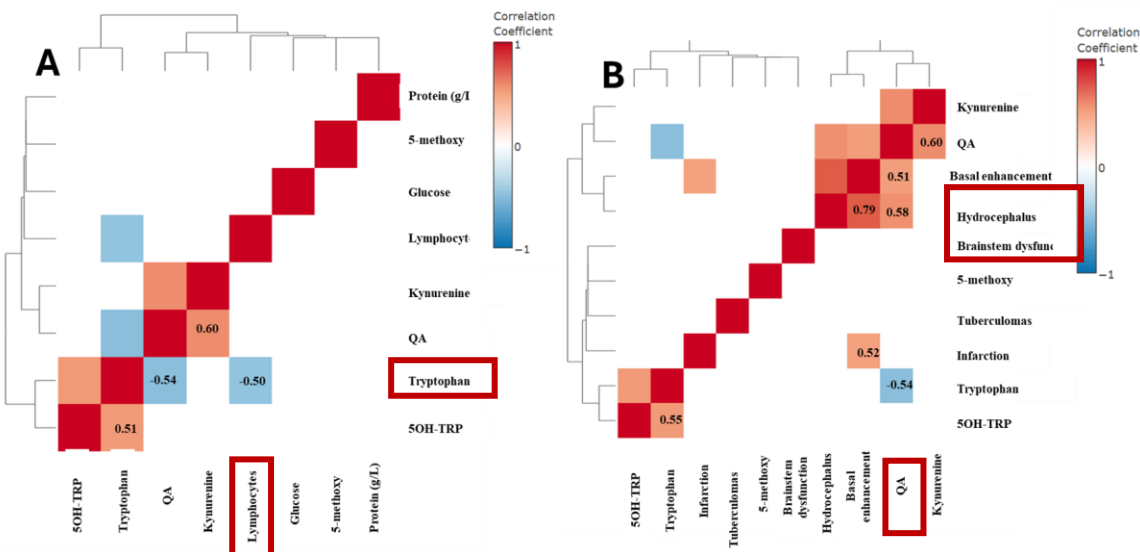
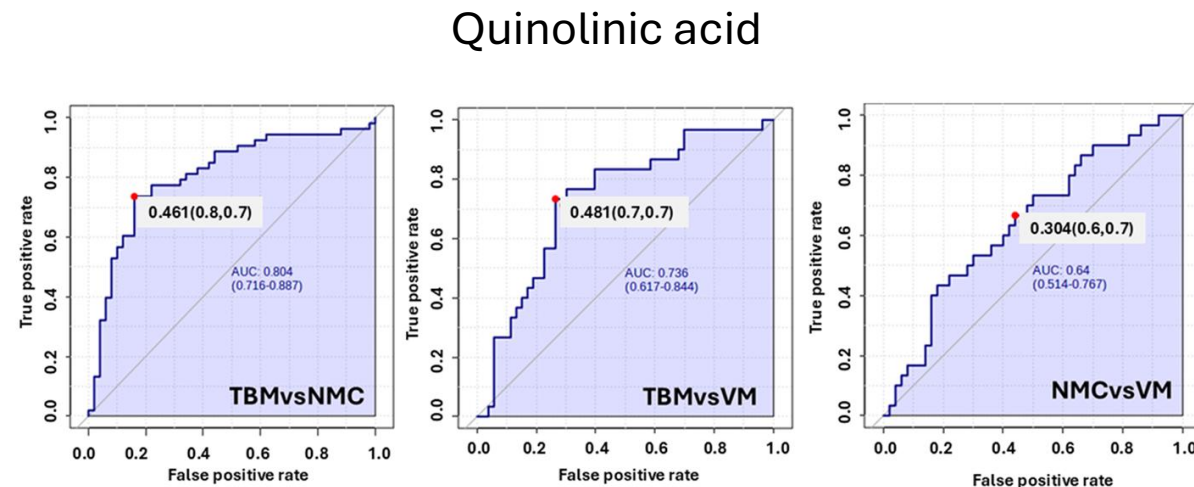
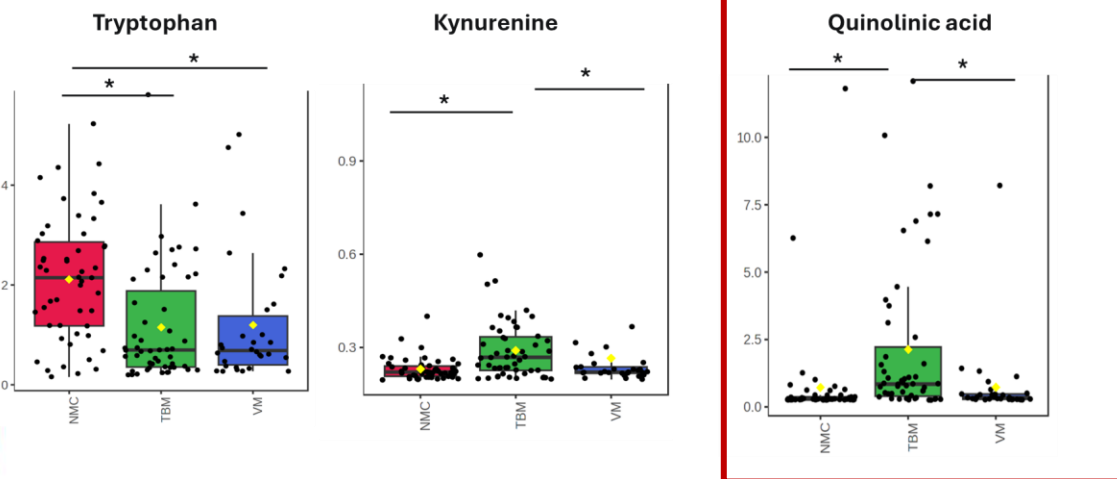
$d = 0.5$ - Medium effect

$d = 0.2$ - Small effect



				y (%)	Specificity (%)
Carnitine	NMC vs. TBM	0.93	90	100	
	TBM vs. VM	0.86	80	90	
	NMC vs. VM	0.59	50	70	

Results – Tryptophan pathway



International Journal of Infectious
Diseases

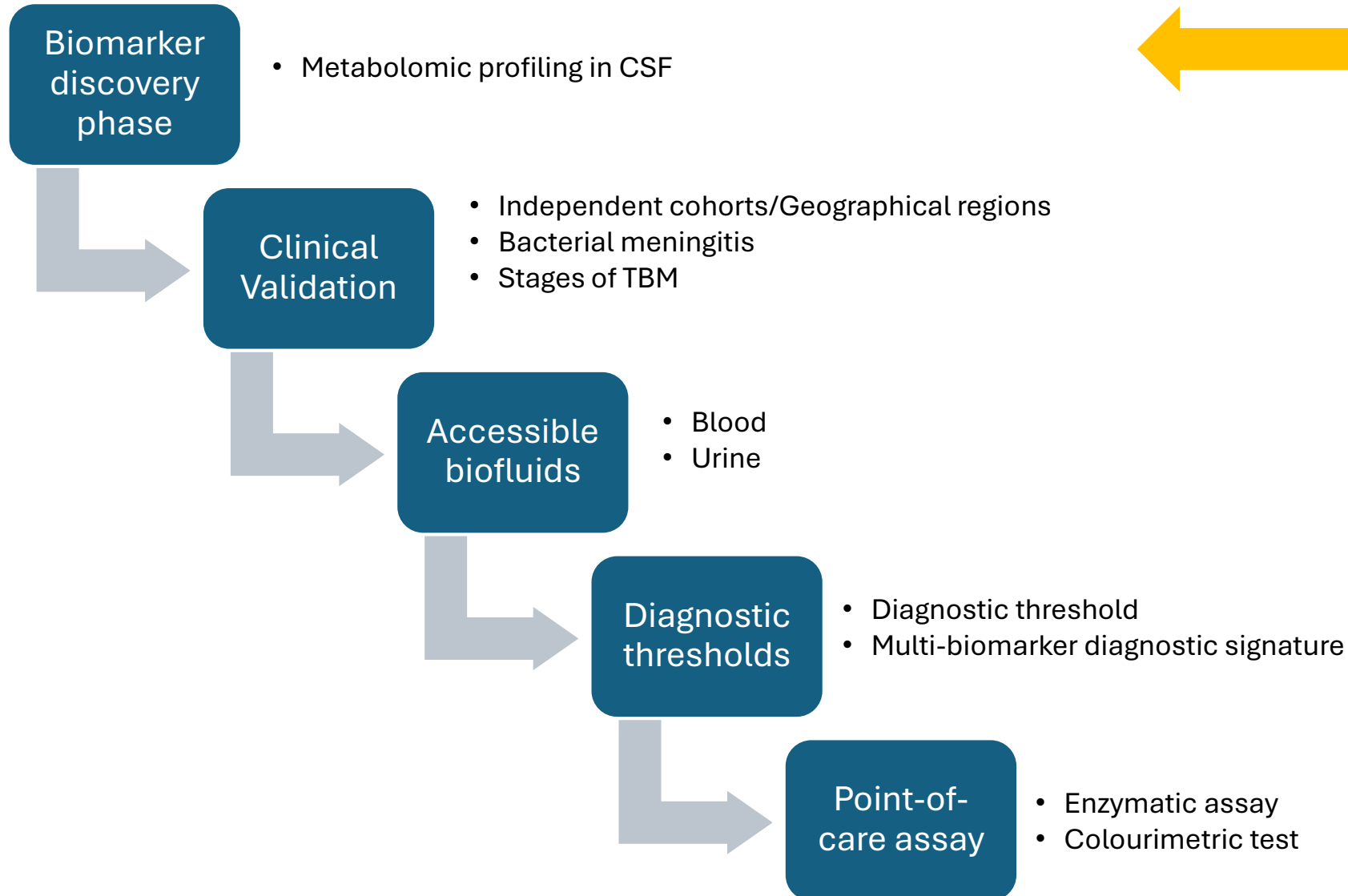
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Characterization of CSF tryptophan metabolites in South African children with tuberculous meningitis

Ontefetse Neo Plaatjie ¹, A. Marceline Tutu van Furth ^{1,2}, Regan Solomons ³,
Martijn van der Kuip ^{2, #}, Shayne Mason ^{1, #}

Conclusion & Translational Implications



Acknowledgements



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- Prof Shayne Mason
- Prof. A Marceline Tutu van Furth
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