Te Niwha

Research Project Impact Case Study

Towards a point of care diagnostic test for gonorrhoea

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Introduction

Since the submission of our original impact case study to Te Niwha, our project has made substantial progress in advancing the foundational science required for a rapid, point-of-care (POC) diagnostic test for gonorrhoea. These developments reinforce the scientific excellence of the programme and strengthen its long-term potential to develop a diagnostic for gonorrhoea infection in Aotearoa New Zealand.

Results

A key focus during this reporting period has been the purification and characterisation of nanobody candidates that bind to conserved epitopes on the gonococcal lipid oligosaccharide (LOS). Building on previous work, we refined our screening workflow to overcome issues of weak cross-reactivity between the 2C7 peptide mimetic and native LOS. We successfully identified two new nanobodies with markedly improved cross-reactivity and binding profiles. Parallel to this, our collaboration with the University of Zurich has progressed, with the llama immunisation programme now completed and the resulting biological nanobody library received and lead hits undergoing purification. This two-stream strategy; synthetic and biological has strengthened the robustness of our discovery pipeline and increased the likelihood of identifying a high-performing diagnostic binder.

Engagement has also strengthened the translational pathway for this work. Through discussions with community organisations and sexual health clinicians, we have refined our sample-handling assumptions and established a pathway for testing nanobody compatibility with real-world swab types and transport buffers. While direct testing on patient samples requires additional ethics approval and will extend beyond this funding period, we are well positioned to progress into clinical validation work when appropriate.

Impact

In terms of impact, this project continues to lay the scientific foundations for a future diagnostic tool that could substantially improve STI testing access and timeliness, particularly for Māori, Pacific Peoples, and rural communities who face disproportionate barriers to care. Our early results demonstrate that nanobody-based detection of conserved LOS epitopes is a viable diagnostic strategy and has the potential to support better antibiotic stewardship, rapid clinical decision-making, and reduced transmission within the community.

Conclusion

Overall, the project has delivered strong scientific progress, expanded collaborative networks, and reinforced the feasibility of a POC diagnostic platform for gonorrhoea. The achievements to date position us for the next phase of development, in which assay integration, clinical sample testing, and stakeholder co-design will be central to maximising impact.