

Infectious Diseases Team, AgResearch – finding solutions for infectious diseases and other problems

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NZBIO conference, International Opportunities
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AGRESEARCH

- Government owned company: Crown Research Institute (CRI)
- Funded from government and industry

4 campuses, 11 farms

- Ruakura: Hamilton
- **Grasslands (including Hopkirk): Palmerston North**
- Lincoln: Christchurch
- Invermay: Dunedin



Infectious Diseases Team

Broad portfolio of projects – common theme (immunology)

Research Projects

- Bovine tuberculosis - vaccines
 - diagnostics (skin test, blood tests, WGS typing of *M. bovis*)
- Johne's disease in cattle – vaccine
- Ovine pneumonia – improved vaccine
- Understanding immunosuppression in dairy cows
- Development of immunity to disease in young animals
 - impact of nutrition
- Vaccine to reduce methane emissions in ruminants
- Facial eczema, endometritis, mastitis



Commercial Work

- TB diagnostics (culturing, Bovigam)
- Potency testing for vaccines - Yersiniavax, Campyvox
- RHD serological testing



RESOURCES

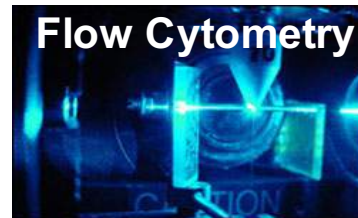
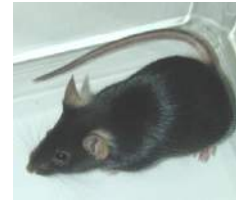
Animal facilities

- AgR Farms
 - access to Massey University & DairyNZ farms
- Large animal containment unit for tuberculosis-infected cattle
- Grasslands large animal (PC1/2)
& small animal facilities (PC2 & PC3)



Lab facilities & capabilities

- Suite of PC2 & PC3 laboratories
- Immunology,
 - FACS (9 colour)
- Molecular biology
 - DNA/RNA, protein
 - PCR, Nanostring
- Virology - cell culture, virus detection/isolation



Animal models

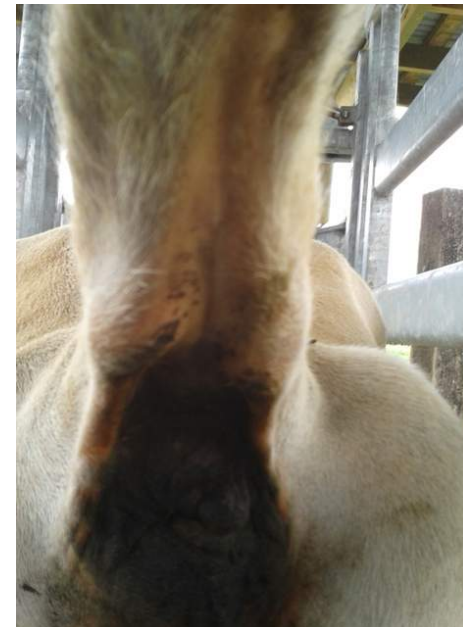
- Large animal: tuberculosis, Johne's disease (calves), pasteurellosis (lambs)
- Mouse influenza model - assess impact of probiotics on vaccine efficacy, anti-viral properties of natural products)

Improved Skin Test for diagnosis of TB

Need to differentiate TB-infected animals from:
Environmental TB
BCG vaccinated

Caudal Fold Skin Test (CFT)

- Primary screen in NZ
- Bovine PPD (tuberculin)
- 5 million cattle tested/year

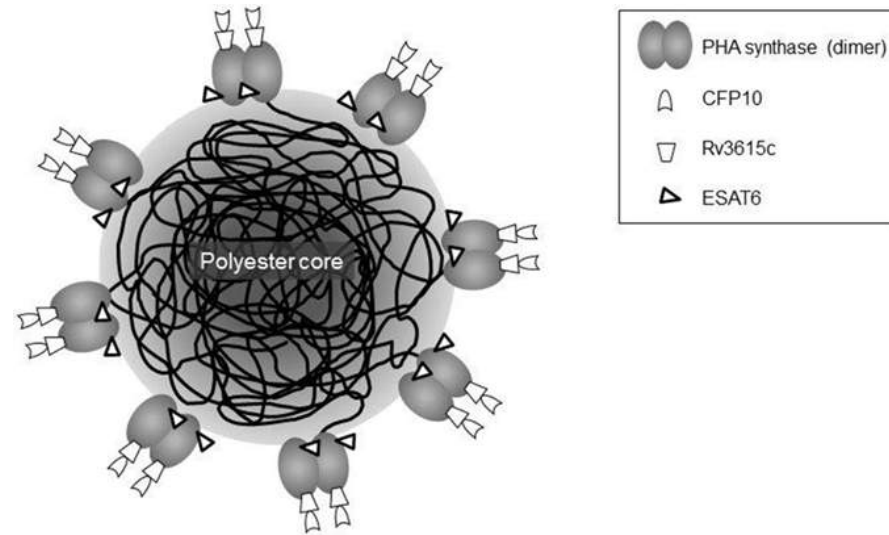


Bio-beads as skin test reagents (collaboration Massey Un/Polybatics)

- Engineer *E. coli* to produce bio-beads which display TB proteins

ESAT6
CFP10
Rv3615c } Mycobacterial antigens

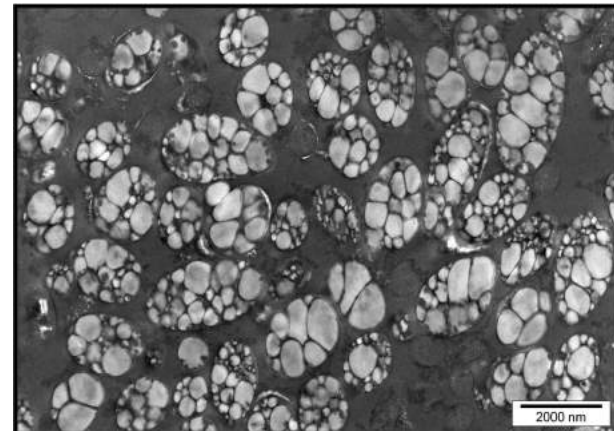
(*M. tuberculosis* complex only)



Compared to bovine PPD

- Greater specificity
- Similar sensitivity
- Similar cost

Bio-beads in *E. coli*



Acknowledgements

AgResearch research scientists

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Collaborations

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TBfree New Zealand	Paul Livingstone
Landcare	Graham Nugent, Dan Tomkins
Dairy NZ	John Roche



International

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