

Camelid Immunomolecules for Advanced Biosensing

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MITRE Sponsored Research

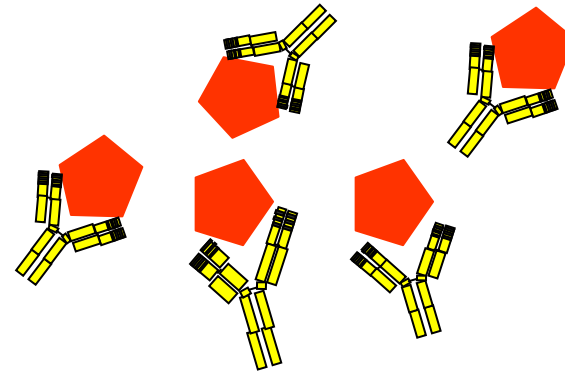
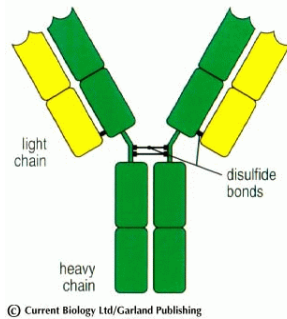


Problem

- **Detecting biological agents such as viruses, bacteria, and toxins under harsh field conditions can be very difficult.**
- **Can better field deployable diagnostic assays be created by using more environmentally stable antibodies as reagents?**

Background

Antibodies work by binding to pathogens such as viruses, bacteria and toxins in a “lock and key” manner



Camelid antibodies are smaller and more stable, so may be much better for field applications



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Objective

- **Research unique antibody molecules found in camelid species - in this case llamas**
- **Produce large libraries of target-specific llamabodies from immunized and non-immunized animals**
- **Compare the performance characteristics of llamabodies with those of the current gold standard, reagent grade antibodies**

Activities

- **Investigating camelid physiology & genetics**
 - Why do these animals produce such unique antibodies?
- **Laboratory-based molecular biology studies**
 - Isolating the genes for target-specific llamabodies
 - Cloning and expressing these genes in yeast to make synthetic llamabody proteins
- **Developing hand-held assays for field use**
 - Working with collaborators to run side-by side comparisons of DoD gold standards to our llamabodies

Highlight

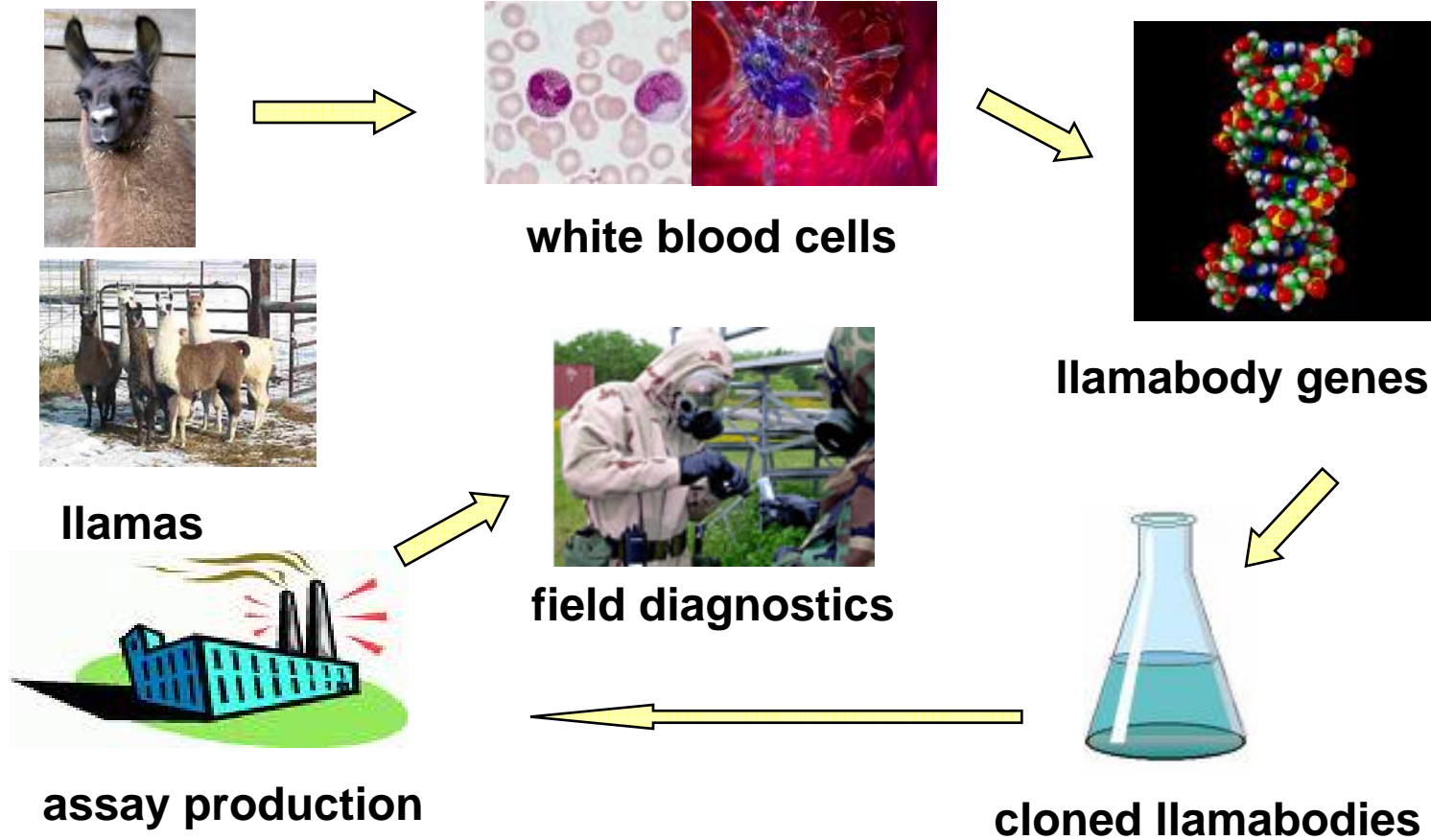


Llamas are one of the five living camelid species in the world

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Highlight



Research Overview

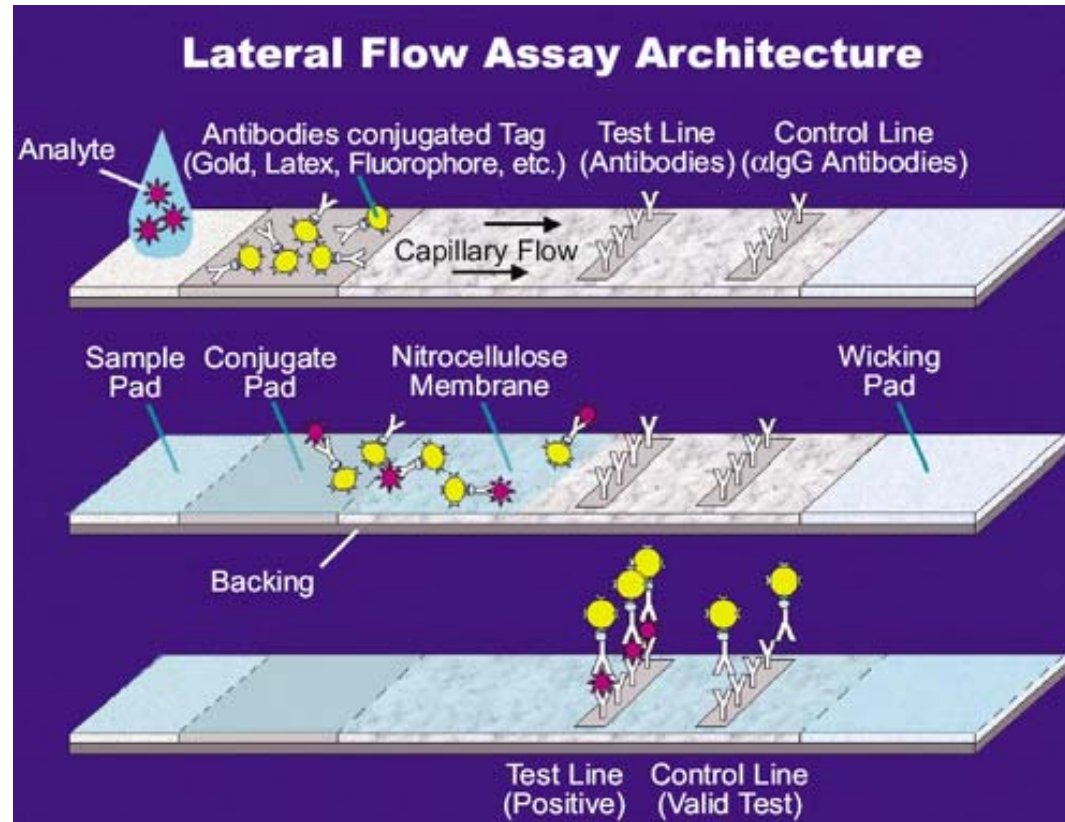
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Impacts

- **Dovetailing cutting-edge research tools with well defined sponsor needs**
- **Building strength in MITRE's Biosecurity Program**
- **Establishing active scientific collaborations and close professional relationships with world class laboratories and researchers**

Future Plans



Use llamabodies in hand held assays for biothreat agents