



Resistance to East Coast fever – An alternative to vaccination

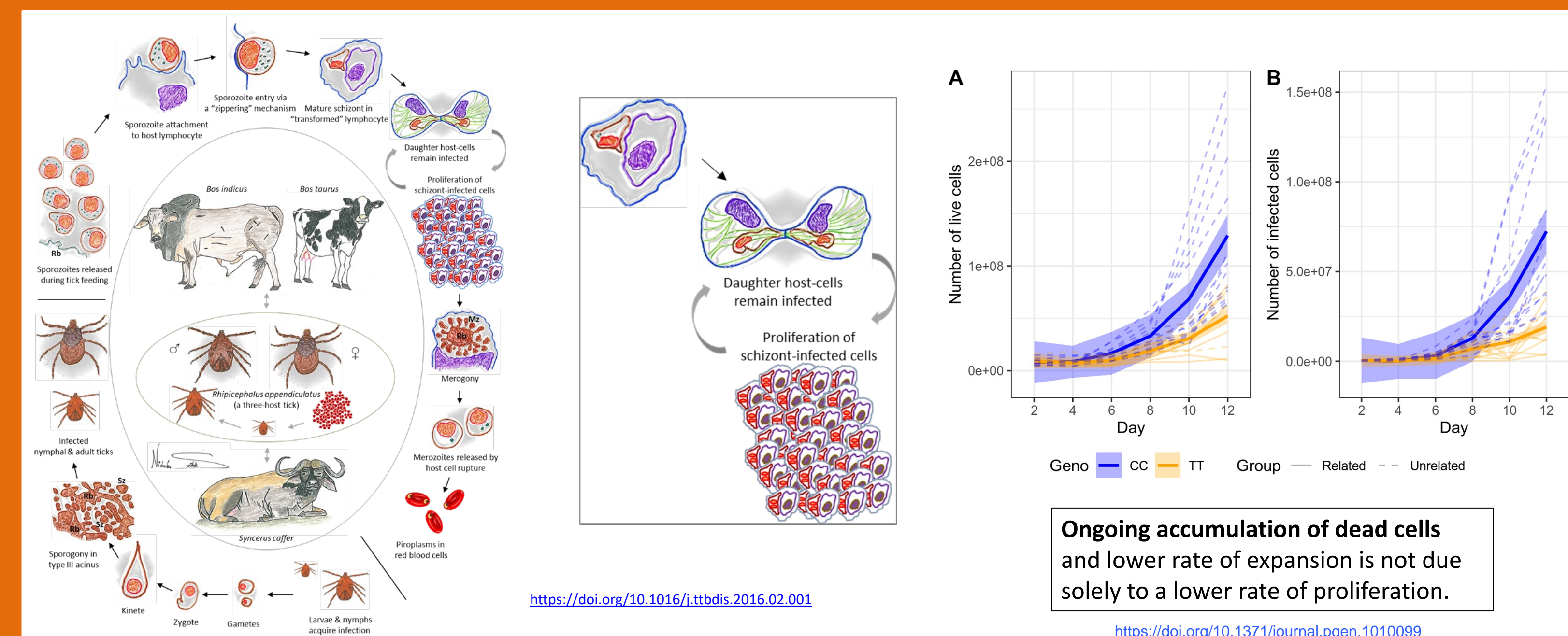
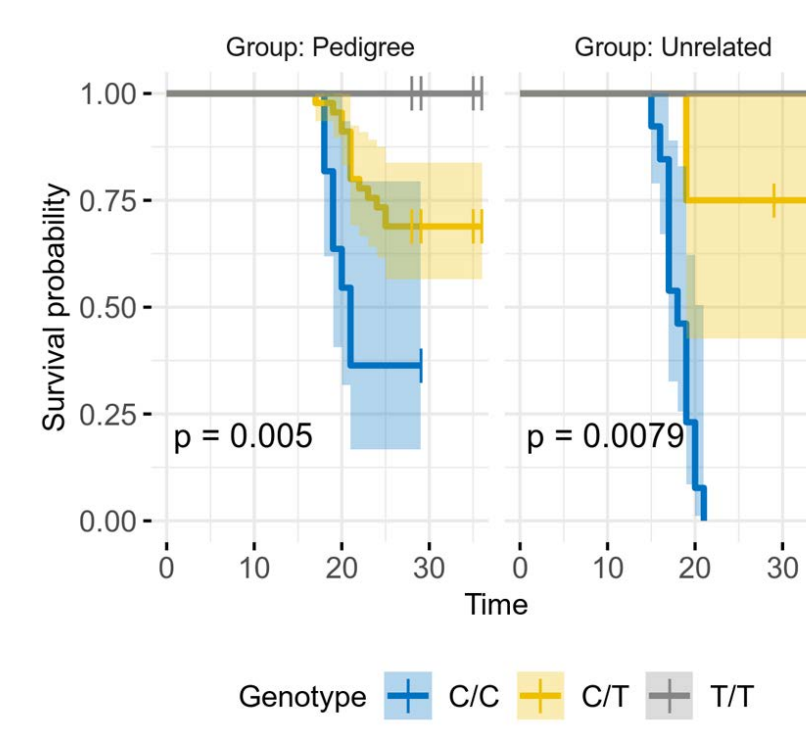
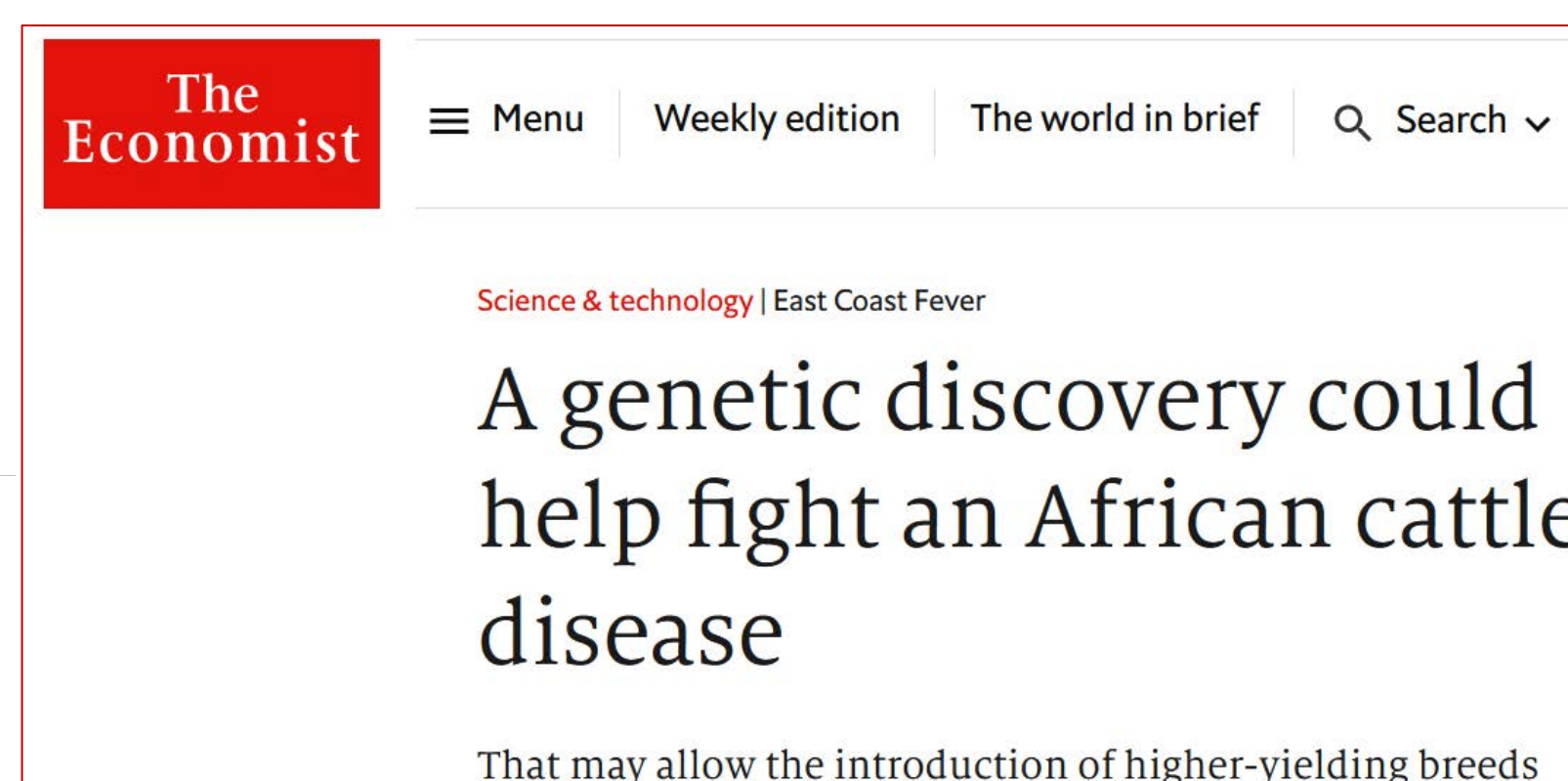
The challenge

- East Coast fever (ECF) is a tick-borne disease that kills one cow every 30 seconds and causes annual economic losses of over \$500 million.
- The current control methods to tackle ECF are through vaccination and acaricide usage.
- The only available vaccine against ECF, the Muguga Cocktail vaccine, administered by the Infection-and-Treatment Method (ITM), has significant drawbacks that limit its large-scale commercialization.
- Acaricide resistance is increasing in the tick vector.

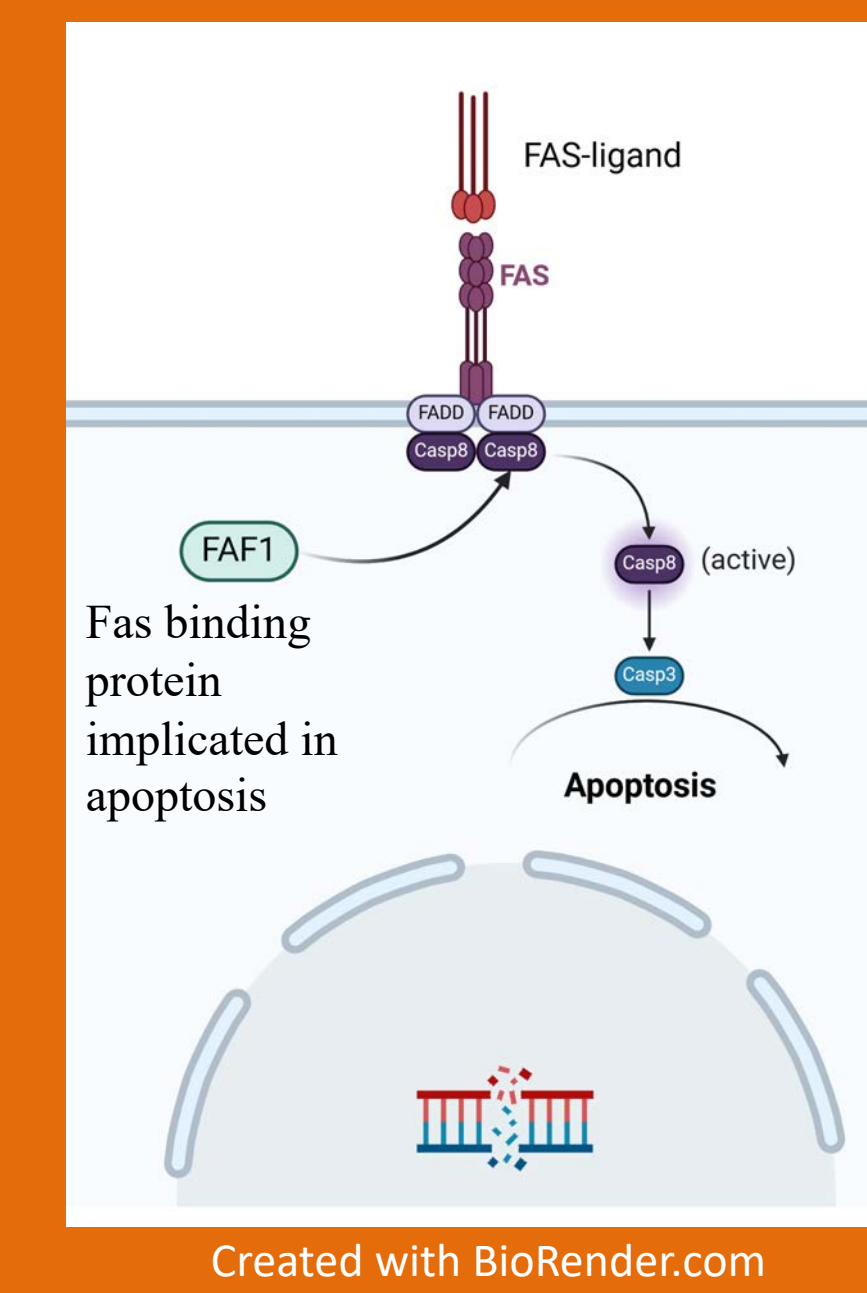
Our innovative approach

- A single nucleotide variant (SNV) in the FAF1B gene in African indigenous cattle has been associated with resistance to ECF. Using this genetic marker could help breed animals that are resistant to ECF.

Bos indicus
Bull 3167



- Theileria parva*, the causative agent of ECF, transforms bovine lymphocytes.
- This transformation is not pronounced in tolerant animals as in susceptible animals.
- FAS-associated factor 1 (FAF1), a paralog gene to FAF1B, is associated with the modulation of programmed cell death (apoptosis) and the activation of the innate immune response to pathogens.
- T. parva* is known to block FAS-induced apoptosis, which is partly responsible for the uncontrolled cell growth of infected lymphocytes.

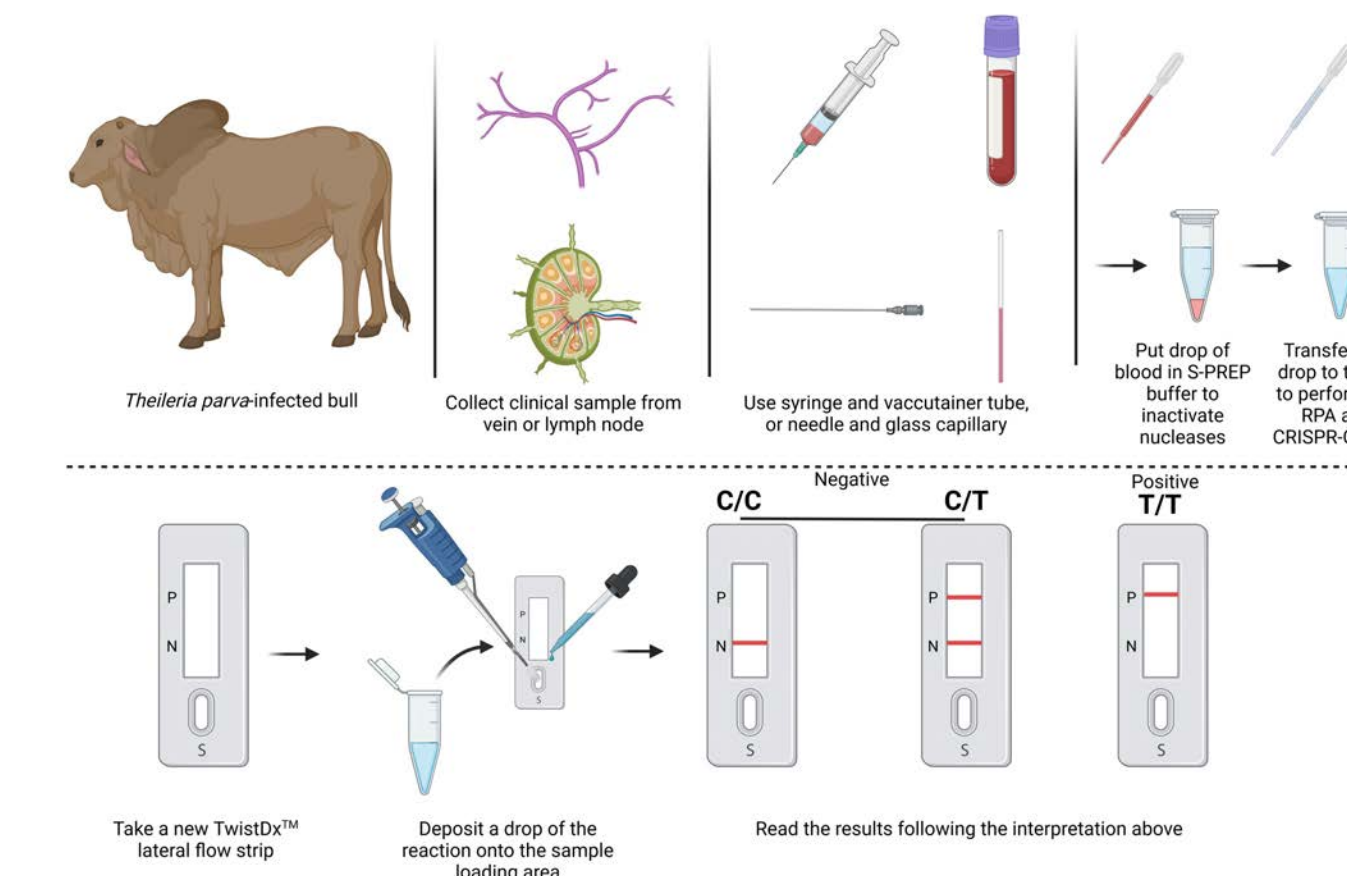


Nicholas Svitek
Senior scientist
n.svitek@cgiar.org

With James Prendergast, Musa Hassan, Tim Connelley, Annie Cook, Gertrude Wekesa.

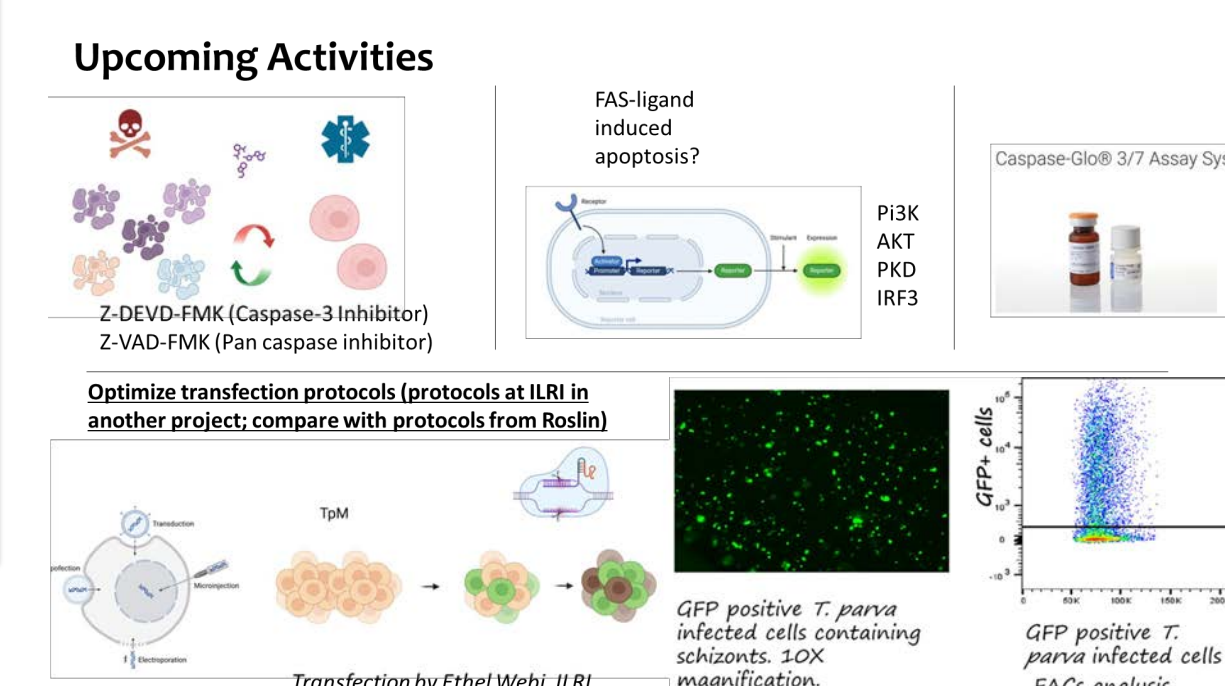
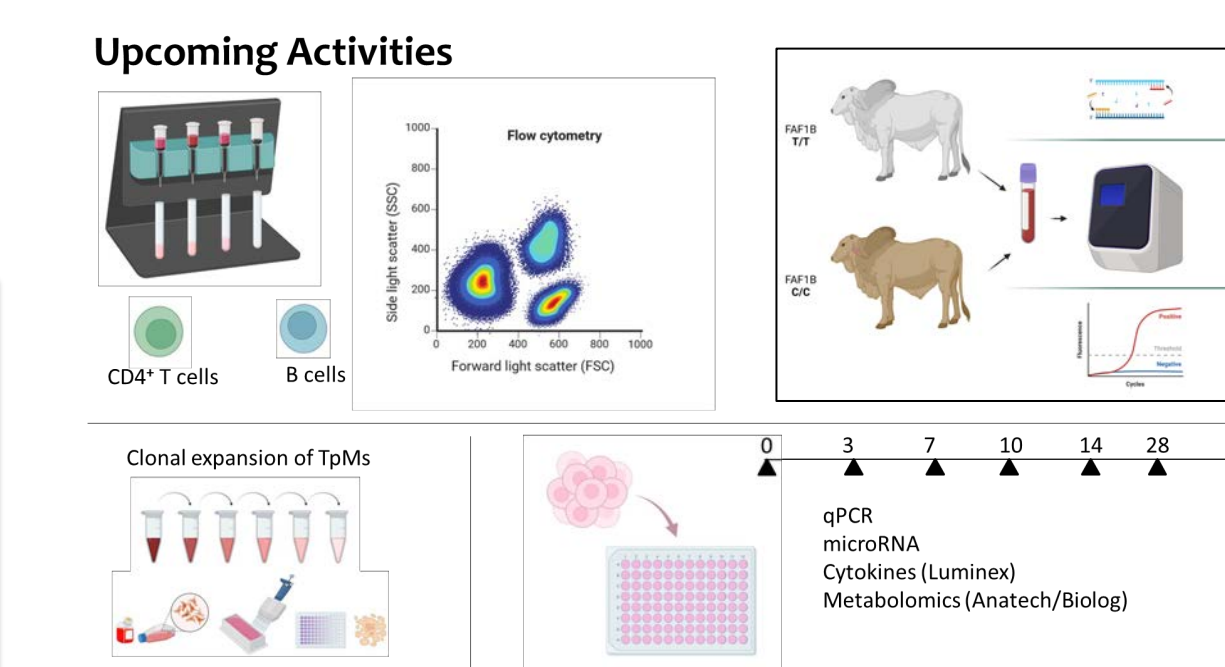
Outcomes

- ECF-resistant cattle will lead to healthier animals and could lead to more productive cattle.
- Developing a pen-side test for the detection of the SNV associated with tolerance could facilitate breeding programs and help collect more data across Sub-Saharan Africa.



Next steps

- Characterize infected cells from tolerant versus susceptible animals.
- Confirm the mechanism of resistance by different cellular and molecular assays.



Partners



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