



The Food and Environment
Research Agency

LAMP for GTD Detection

Jone Santin Azcona

Asuman Ergün

Kate Perkins

James Woodhall

Rami Muñoz

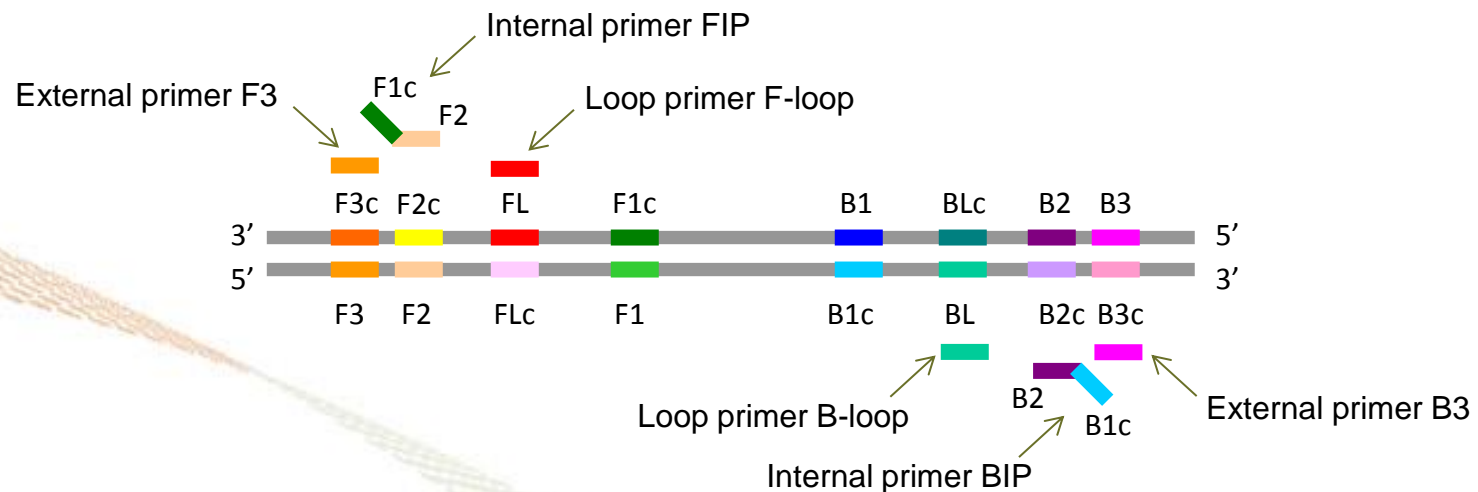
Guido Marchi

Tamara Cinelli

Laura Mugnai

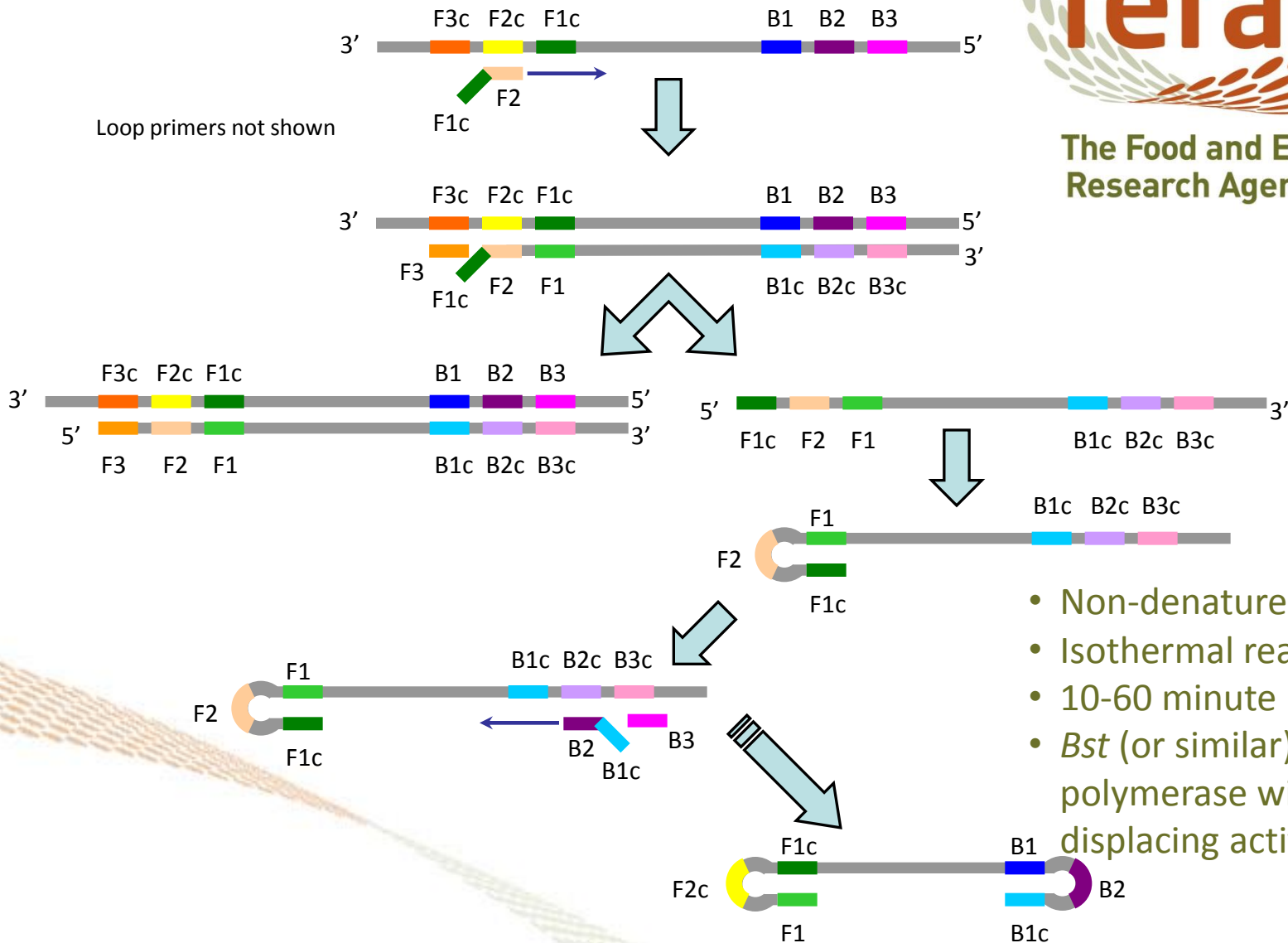
LAMP: Loop-mediated isothermal AMPlification

- Notomi et al. 2000
- 3 pairs of primers (internal, external, loop)
- *Bst* (or similar) DNA polymerase with strand-displacing activity
- Internal primers generate product containing single-stranded loops
- typical reaction conditions: 30 minutes @ 65°C





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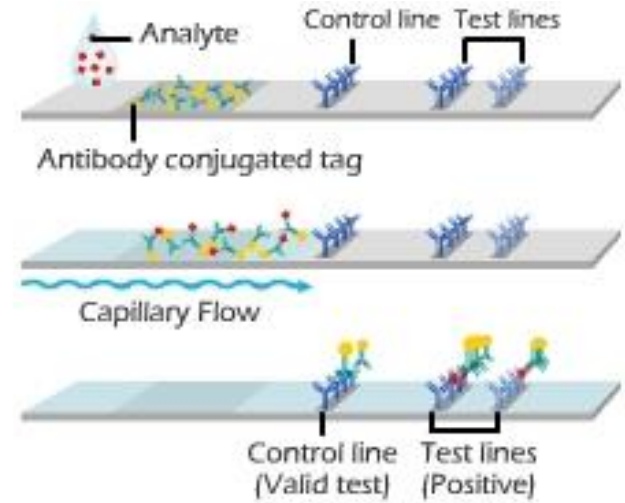
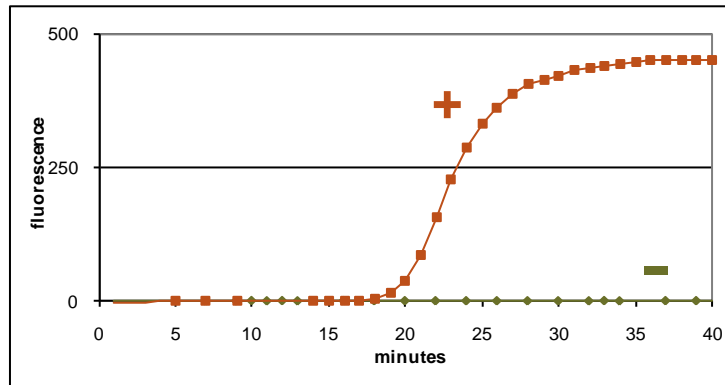


- Non-denatured target
- Isothermal reaction at 65°C
- 10-60 minute reaction time
- *Bst* (or similar) DNA polymerase with strand-displacing activity

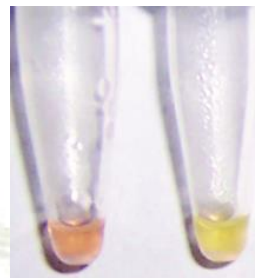
Detection of LAMP products



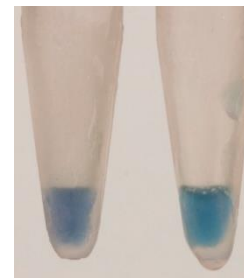
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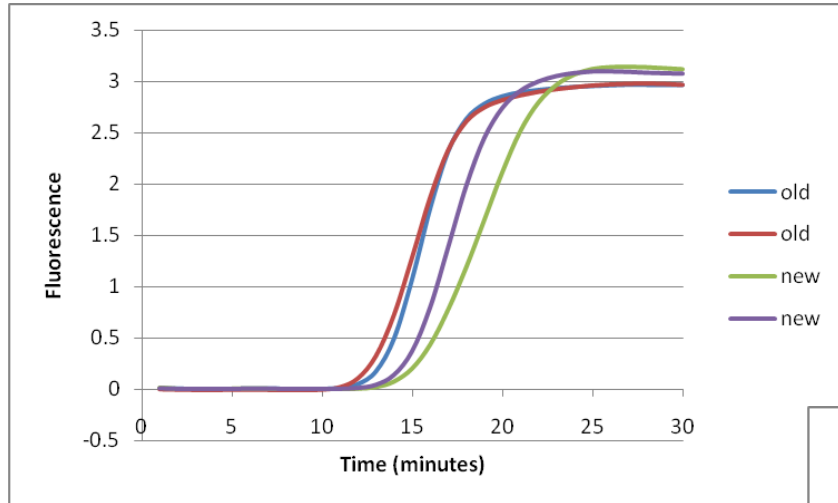
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Genie I, II & III



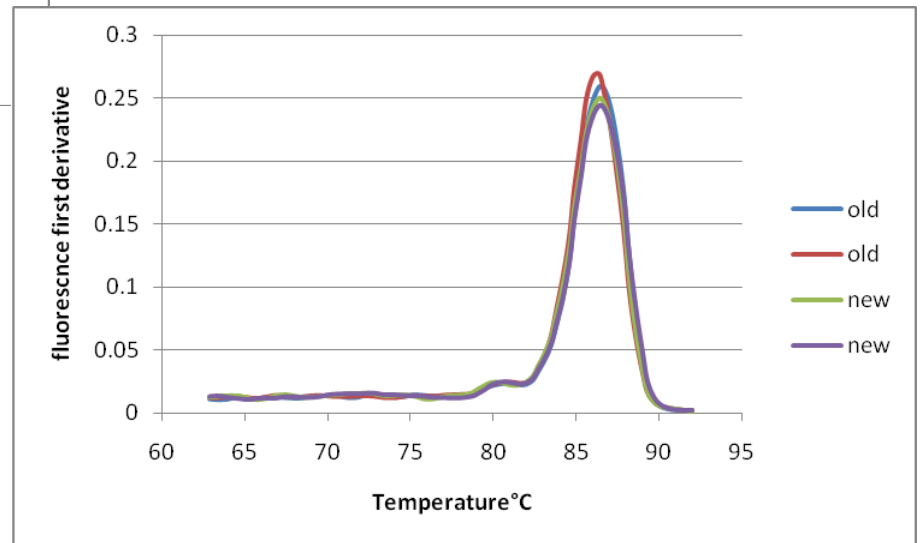
- touchscreen
- Intuitive user interface
- Can connect to computer for additional analysis, archiving of results
- Battery-powered

Genie Output



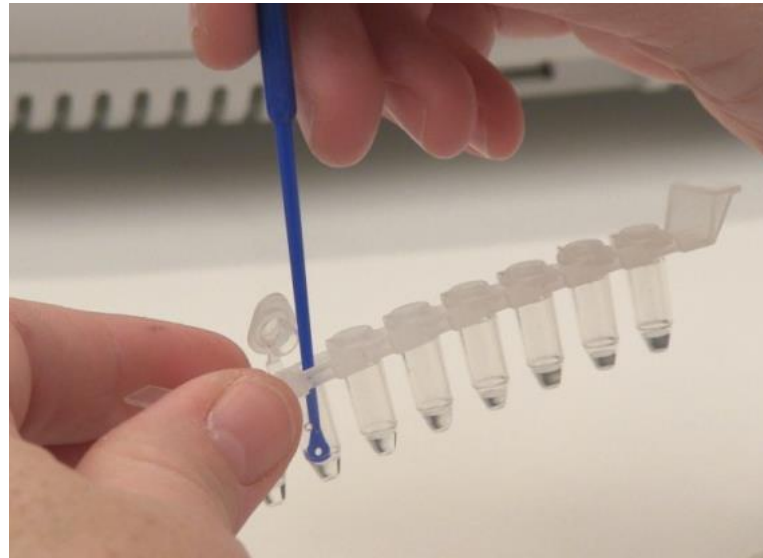
← Time to positive
(T_p)

Annealing
temperature →

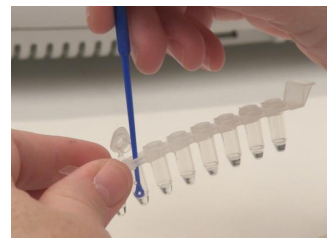
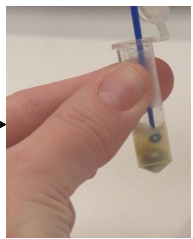
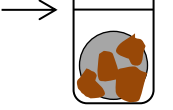
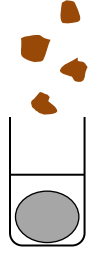
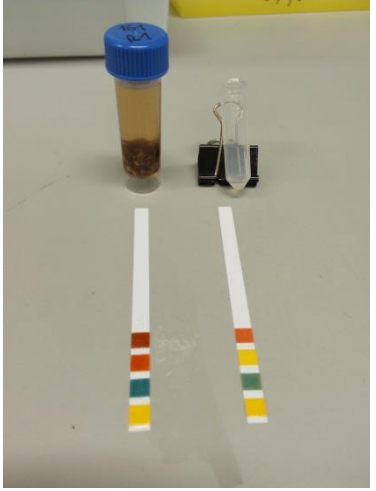


DNA extraction

- Crude extraction – preferably single step, no equipment
- LAMP reagents set up in advance
- Samples added to reactions using disposable inoculating loops (no pipettes)



DNA extraction



Dilute 1:10

LAMP

Robust

Easy to use

Rapid

Portability

Cost

Sensitivity

Specificity

Development time

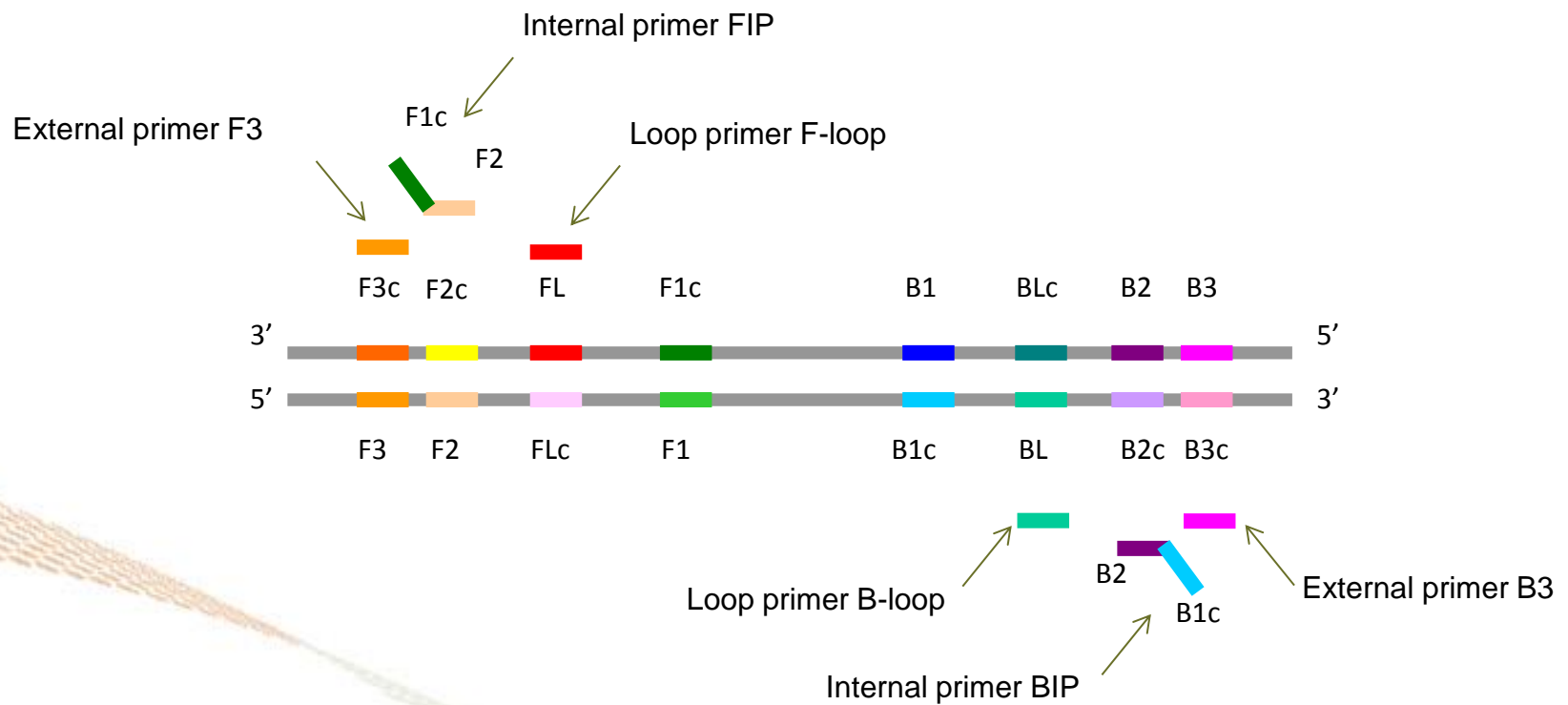
✓

✓

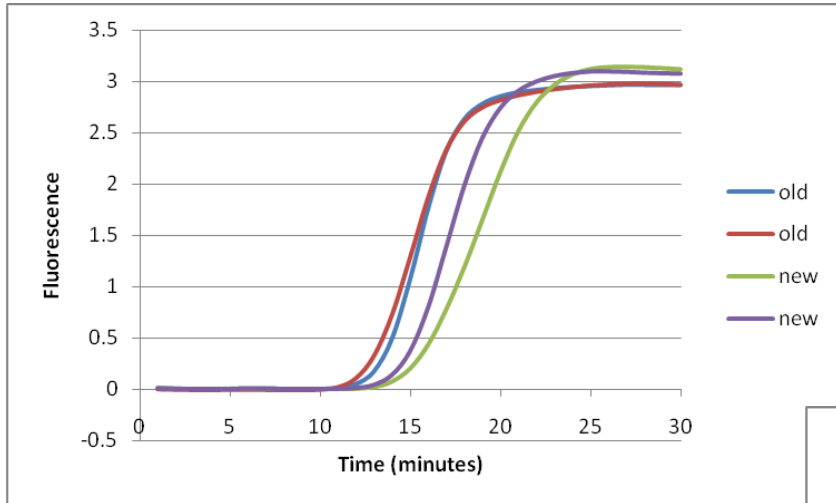
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Specificity: more primers, ability to build in more specificity

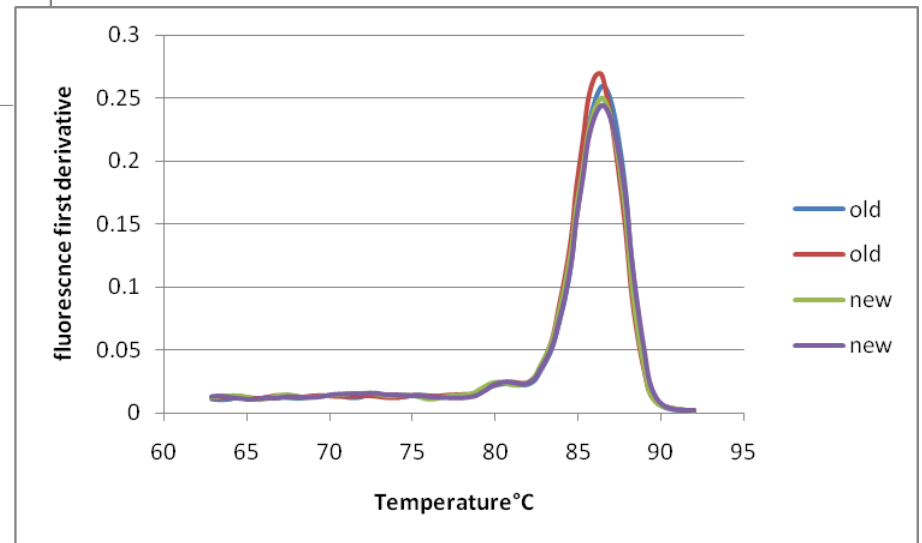


Genie Output



← Time to positive
(T_p)

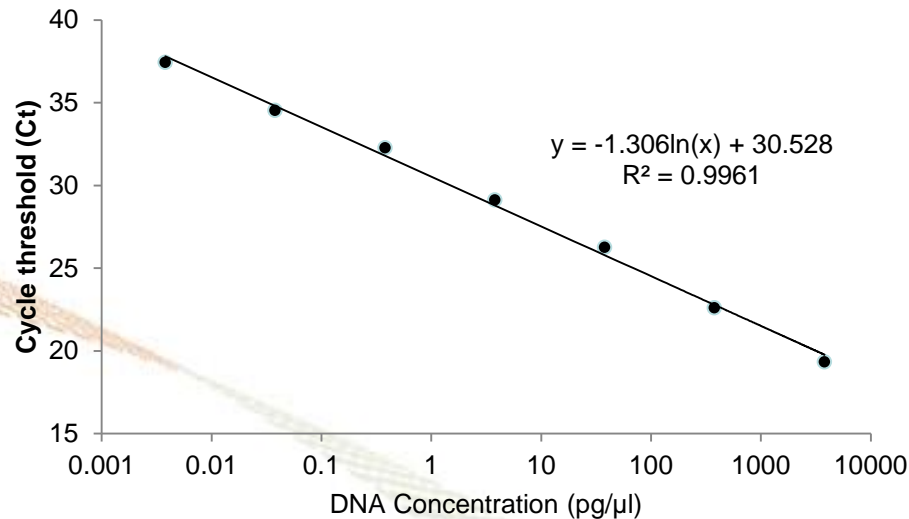
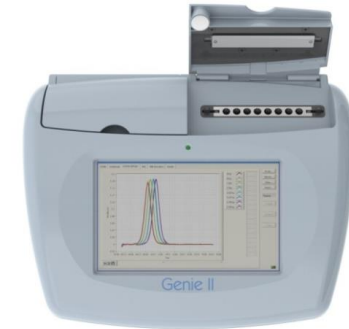
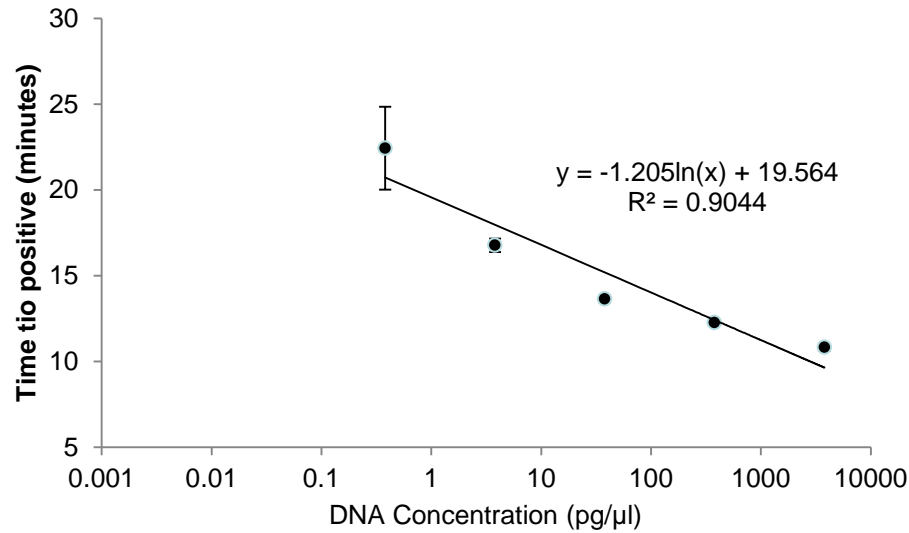
Annealing
temperature →



Sensitivity with assay to rDNA ITS



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LAMP: ticks all the boxes!

Robust

✓

Easy to use

✓

Rapid

✓

Portability

✓

Cost

✓

Sensitivity

✓

Specificity

✓

Development time

✓

