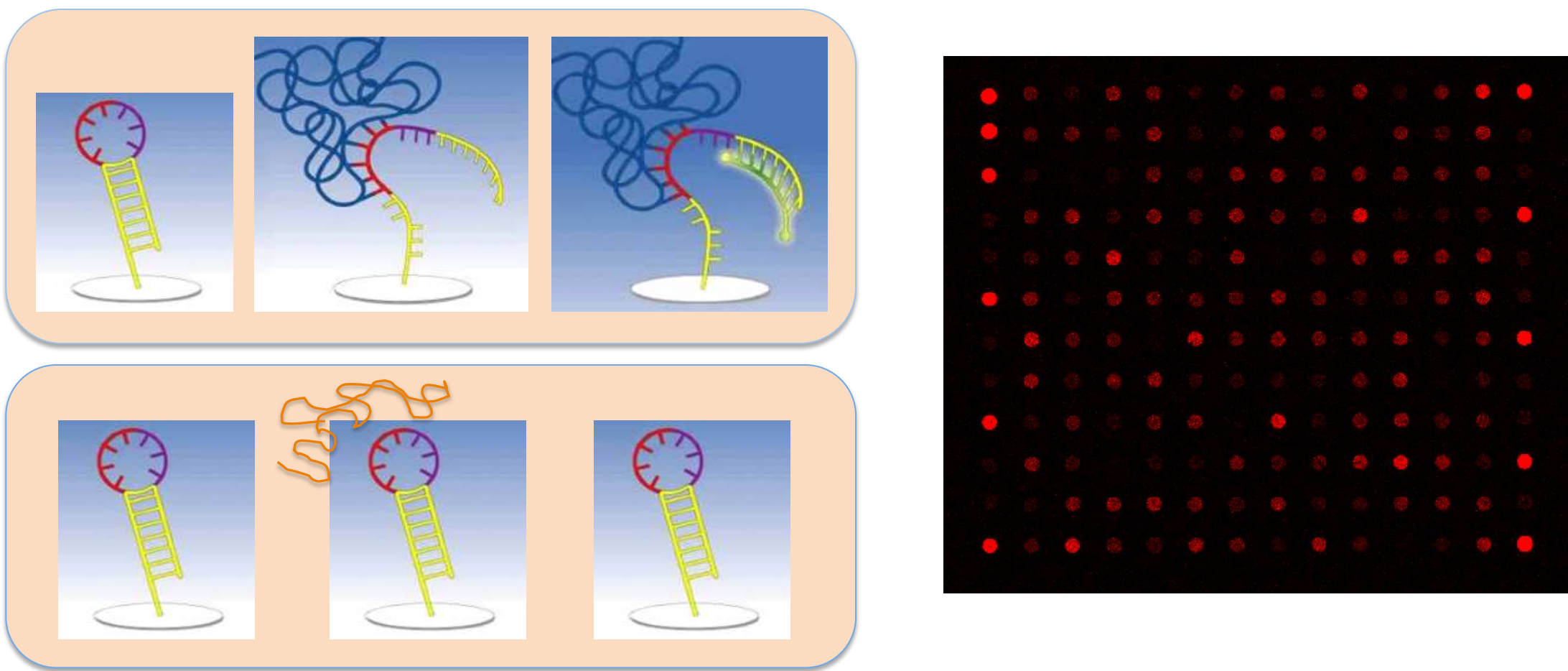


Preliminary Validation of CAPTURE with UTI Samples

Elizabeth Gates, BSN Student & Dr. Louise O’Keefe, PhD, CRNP, College of Nursing, Paula Koelle, GeneCapture

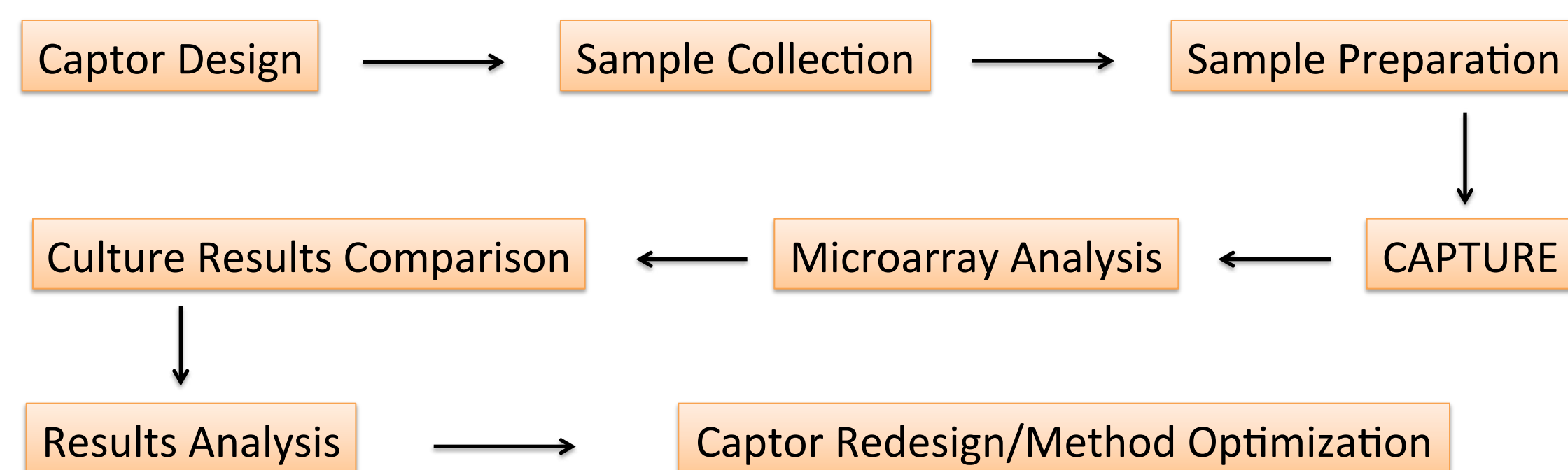
Purpose

The current method for identifying pathogens in human urine samples is a lengthy process, usually taking 2-3 days to complete. During this delay period, the patient may become sicker, the pathogens may mutate, and unnecessary or incorrect treatments and antibiotics may be administered. There is a need for a more rapid diagnostic method to provide the patient and healthcare provider an immediate diagnosis. The rapid diagnostic method being tested has been coined the CAPTURE (Confirming Active Pathogens Through Unamplified RNA Expression) method, created by GeneCapture. The CAPTURE method uses a molecular diagnostic technique to determine a genetic match for the pathogen using DNA captors that will identify the pathogen in less than one hour for minimal expense.



Pathogenic nucleic acids pass over the captors on the microarray and bind to their complement in the loop region; this binding forces the stem to open (the captors only remain open if the correct target has bound). The captors that remain open then bind to a universal detector. The microarray is washed stringently to remove any mismatched or unbound nucleotides.

Methods



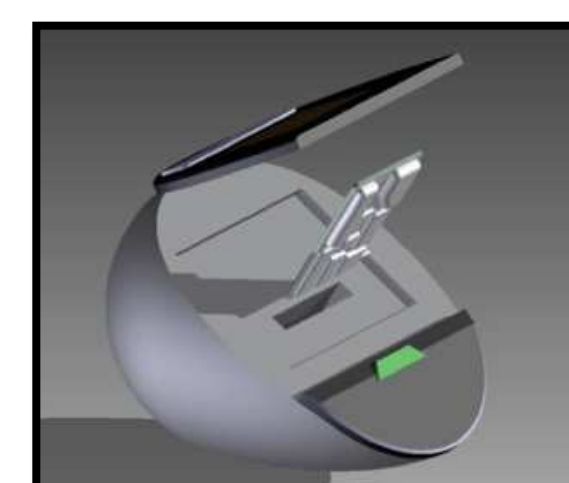
Key Findings

Sample	Culture	CapLab
UAH001	Group B Strep	(-)
UAH002	E. coli	(-)
UAH003	Mixed flora	(-)
UAH004	No Growth	(-)
UAH005	E. coli	E. coli
UAH006	No Growth	(-)
UAH007	No Growth	(-)
UAH008	No Growth	(-)
UAH009	No Growth	(-)
UAH010	Mixed flora	(-)
UAH011	Group B Strep	(-)
UAH012	Mixed flora	(-)
UAH013	E. coli	E. coli
UAH014	K. pneumoniae	K. pneumoniae
UAH015	No Growth	(-)
UAH016	Mixed flora	(-)
UAH017	No Growth	(-)
UAH018	No Growth	(-)
UAH019	E. coli	E. coli

Note: Samples were run across a panel that covered captors for many pathogens including 8 of the most common for urinary tract infections such as: *E. coli* & *Klebsiella*. Culture for UAH001 and UAH011 found *Streptococcus agalactiae*.. Further research showed that this bacteria can be a cause of UTIs, a result of a kidney stone, & very harmful during pregnancy – a captor for this bacteria will be added to the panel in the future.

Implications for Practice

- 1) Rapid diagnosis & determination of pathogen in clinic for timely & accurate treatment
- 2) Use in areas with no access to labs or other medical facilities i.e. military missions, disaster areas
- 3) Potential use for pandemic emergence & tracking
- 4) Potential uses for agriculture & identification of plant pathogens
- 5) Potential for cancer detection and treatment monitoring



Vision for final CapLab

Acknowledgements

GeneCapture: Peggy Sammon, CEO, Dr. Krishnan Chittur, CTO; UAH Faculty & Staff Clinic: Amber McPhail, MSN, CRNP; Microarrays, Inc.; HudsonAlpha Institute for Biotechnology BioTrain Internships