MatMaCorp

MatMaCorp

NEBRASKA INNOVATION CAMPUS

MatMaCorp

- Started in 2014 – DED prototyping grant (2015), followed by investment from Invest NE in 2016.
- Today, 24 FTEs - 9 Engineers (3 MS, 2 Ph.D.), 13 in the Life Science group (1 MS, 5 Ph.D. of which one is DVM/Ph.D)
- Goal - provide elegant, affordable, easy to use devices and systems for agriculture, science and medicine.
- Make science and technology accessible to everyone, everywhere!
- Simple solutions for complex problems - product development philosophy.
- Initial effort – Portable Nucleic Acid Analysis System – addresses a need in the market.

Nucleic Acid Analysis

- 1. DNA/RNA Isolation
- 2. Targeted DNA/RNA amplification
- 3. Detecting Variations (SNPs) within the target or detecting the target itself
- 4. Presenting the Variation/Target in a useful format
- MatMaCorp has touched all of these and effectively changed it

The Problem

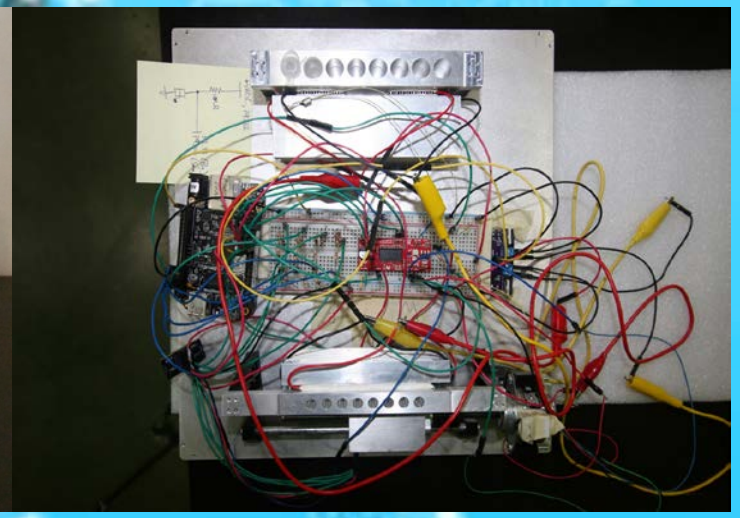
- **Molecular techniques -** require specialized skills and equipment
- **Lab Skills –** using micro pipettes - specialized reagents and kits for isolating DNA and setting up reactions like PCR (Polymerase Chain Reaction)
- **Equipment –** micro-centrifuges, micropipettes, PCR or other isothermal amplification devices
- **Reagents and Kits** have to be shipped and stored frozen - therefore field use is limited
- **Overall –** expensive and inefficient

Points to Ponder

- How do you isolate DNA/RNA without lab tools like centrifuges and pipettes?
- Can we develop a molecular method that allows anyone to detect DNA/RNA from any sample and also detect genetic variations (mutations) at the same time?
- Can all the reagents be delivered without freezing or refrigeration?
- Can we develop dried reagents for everything and how do we deliver it to the field?
- Can we develop a device that can detect nucleic acids using established 4 wave-length fluorescence technology?
- How do we do all this with the myriad of patents that protect everything you can think of?

From 2014 to 2015

Prototyping Grant from DED



Nucleic Acid Analysis

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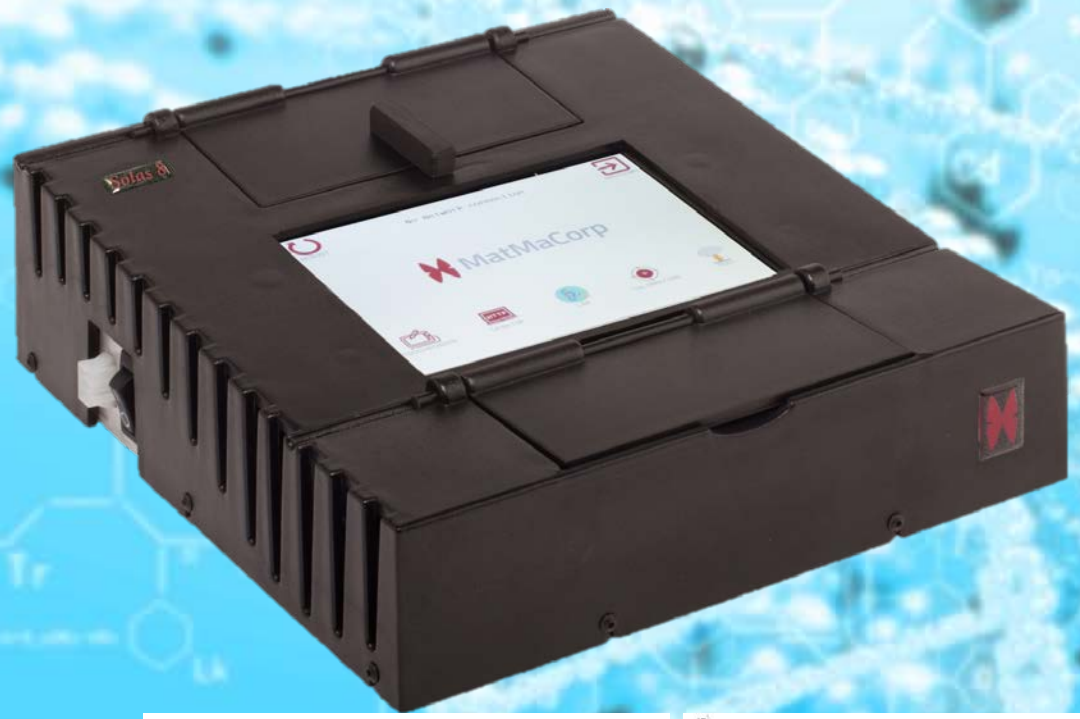
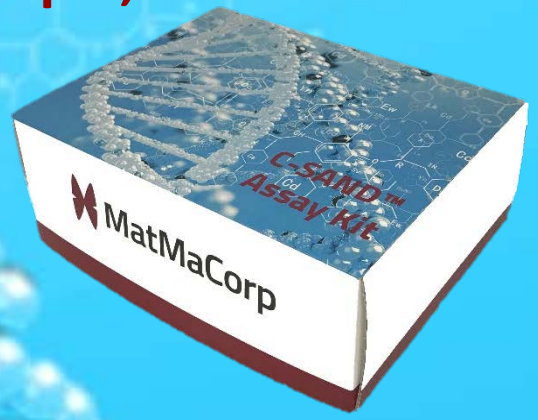
A Complete Solution

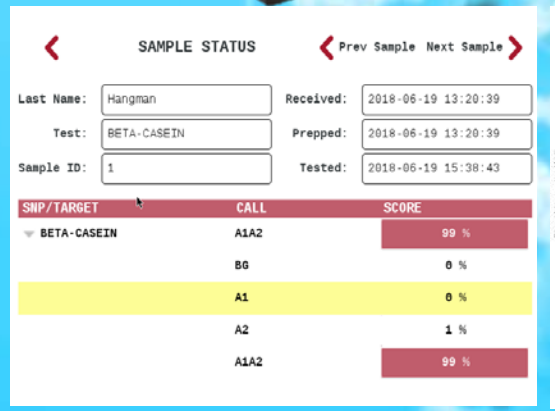
Solas 8

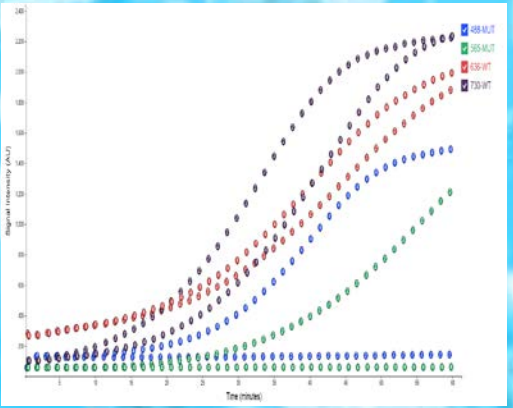


MagicTip
Step 1

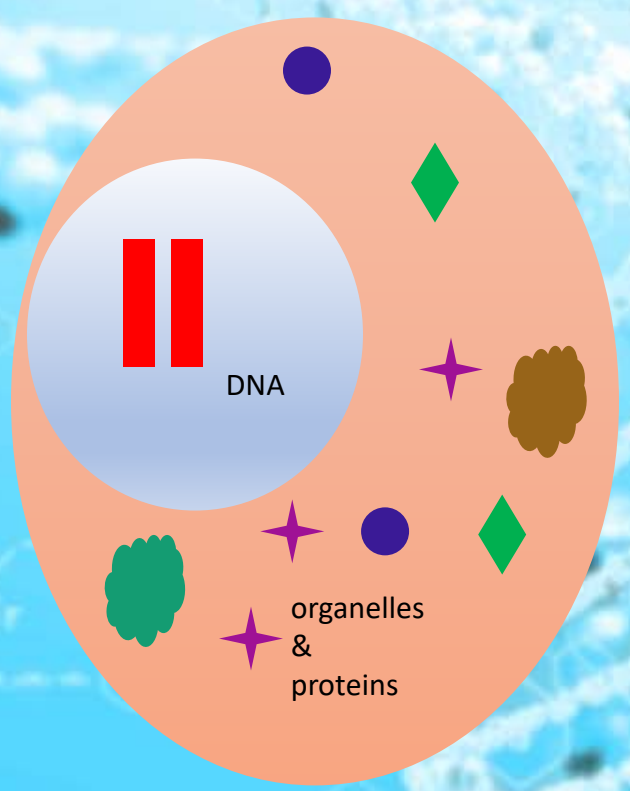
C-SAND Assays
Step 2, 3



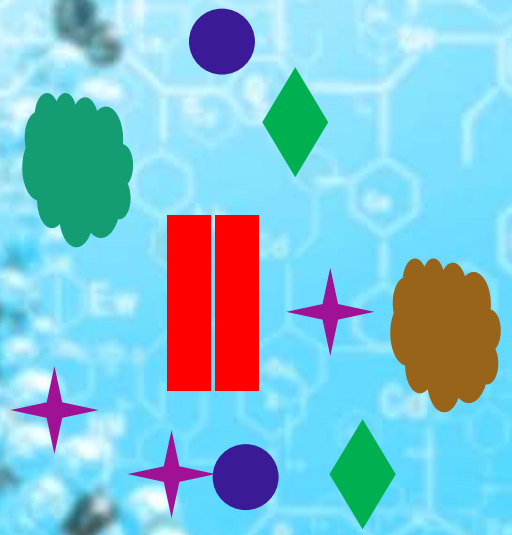




DNA Isolation



cell lysis



isolation

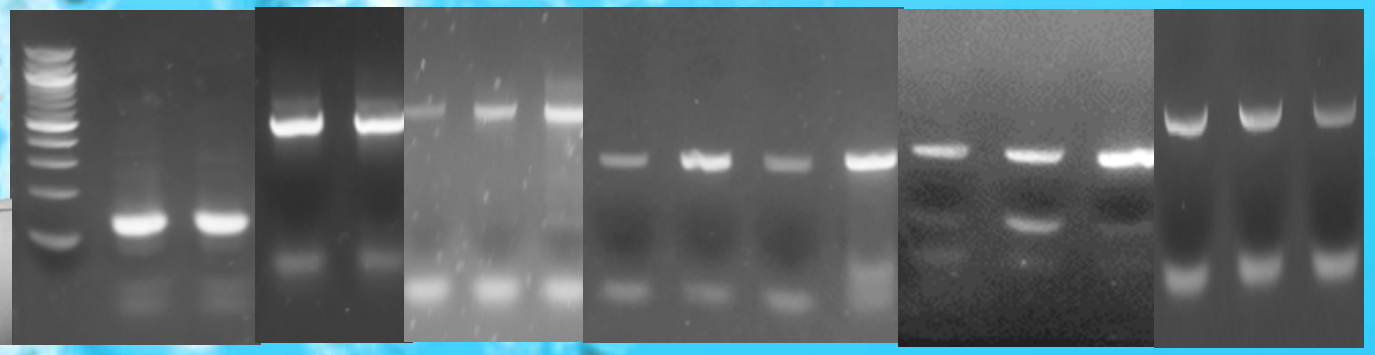
DNA

MagicTip™

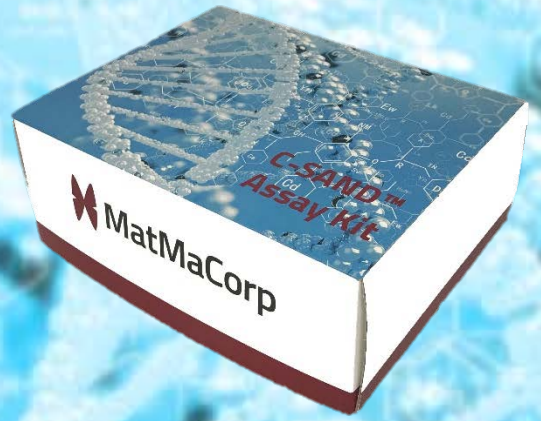
- **Blood**
  - Cow
  - Chicken
  - Horse
- **Milk**
- **Plants**
- **Hair**
  - Pig
  - Bovine
- **Semen**
  - Pig
  - Cow
- **Insects**
  - Fruit Fly
  - Lice

- **Tissue**
  - Beef
  - Chicken
  - Pork
  - Turkey
  - Zebrafish
  - Rabbit
- **Cells (buccal)**
  - Dog
  - Human
- **Virus and Bacteria**

PCR Products from MagicTip DNA



C-SAND Assay™



- Combined Sequence Amplification and Nucleotide Detection
- Small block – 8 wells, used for DNA amplification and detection
- These kits can be completely customized – business model
- The reagents are dried

Field Use Kits

C-SAND Assay Kits

Solas 8

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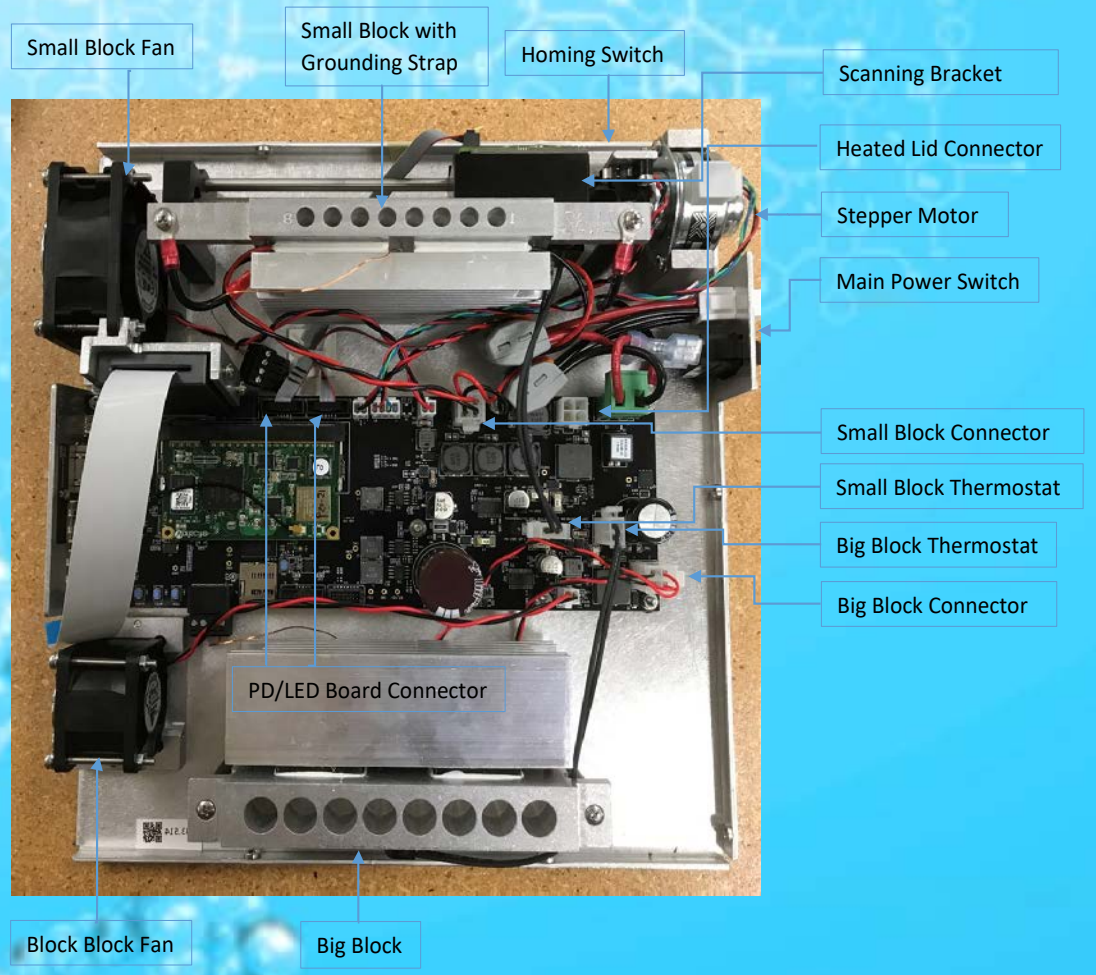
MatMaCorp


Small Block Fan
Small Block with Grounding Strap
Homing Switch
Scanning Bracket
Heated Lid Connector
Stepper Motor
Main Power Switch
Small Block Connector
Small Block Thermostat
Big Block Thermostat
Big Block Connector
PD/LED Board Connector
Block Block Fan
Big Block

Competitive Advantages

- Portable, affordable and easy to use system
- Wide field of use – food safety, agriculture, medicine and research markets
- Four wavelength detection – allows SNPs (mutations) and targets to be detected simultaneously
- Can analyze 8 samples while isolating DNA from another 8
- Company owns DNA isolation, DNA amplification and detection technology – freedom to operate in a competitive market place
- Multiple patents including one from Germany!

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