Traceability, Transparency and Trust
TRUST & TRANSPARENCY
Consumers associate the following environmental issues with global manufacturers:

- Water Waste
- Greenhouse Gas Pollution
- Land Use
- Soil Loss
- Waste Toxicity.
Consumer’s are aware of the damaging environmental impact of plastic use.

Most brand strategies continue to place the responsibility onto the consumer – to recycle.
THIS IS PUTTING PRESSURE ON CORPORATE TRANSPARENCY
Entering a new era of sustainability and it’s touching every corner of the world.

Driven in part by **consumers, governments, corporations** and the growing visible effects of pollution, sustainability initiatives are becoming more aggressive and more expected.

**Consumers** are searching for options that are healthier for them, their families, their homes and their environment.

**Retailers** are demanding more data transparency from supply chains to support their own sustainability goals.

**Brands** need to know the entire supply chain’s ethics – to speak honestly to their consumer.

Sustainability: meeting our needs today without compromising the ability of future generations to meet their own needs.
This consumer is projected to spend $150bn on sustainable goods by 2021

61% concerned about sustainability.

85% of millennials felt strongly that companies should help to improve the environment.

40% said they will take a stand against companies who do not treat their employees fairly or employ sustainable practices during the manufacturing process.

2/3 indicate they research to find environmentally-friendly products.

A smarter consumer

How do we win them over?
TRANSPARENCY & TRUST
CONSUMERS DO TRUST IN COTTON

Consumers associate 100% cotton with sustainability more than other fabrics such as wool, silk, polyester, rayon or spandex.

83% of consumers believe cotton is safe for the environment.

69% believe that US cotton is viewed as more sustainable, responsibly produced and higher quality than cotton grown in other parts of the world.
People Buy...
From People They Trust

Consumer trust today is necessary. Traceability throughout our supply chain allows us to demonstrate our trust value.
Forensic traceability and tracking reduces risk
Applied DNA Sciences

• Corporate HQ in Stony Brook, NY; LineaRx subsidiary

• 50+ staff in US, UK, India; Distributors in US, EMEA
  • Central Testing Laboratory in Ahmedabad, India

• 61 issued patents and 50 pending patent applications

• Regulatory and Accreditations
  • ISO 9001:2015 Certified/Registered (ANAB) – quality management
  • ISO/IEC 17025:2005 Accredited (A2LA) – testing and calibration

• Core competency in very large scale PCR-based mass production of DNA
  • DNA taggant to manage large commercial ecosystems
  • Larger engineered amplicons and genes as biotherapeutics (LineaRx subsidiary)
Weak Links in the Supply Chain

- Easy to Substitute Fiber(s) - More than one origin
- Poor Quality Controls - Reliance on Paper Trail
- Weak Brand Protection - Diversion & Fakes - Risk for Mislabeling

Is it Real? Is it Safe? Is it what it says its is?

Countries of origin

Countries of distribution

Raw material extraction (for example cotton)
- Cultivation
- Ginning

Spinning

Weaving / Knitting

Processing
- Bleaching
- Dyeing
- Printing
- Smoothing / softening

Cut, make, trim

Shipping / Export

Distribution

Retailer

Consumption

Disposal / Recycling
We close the loop for our Partners

DNA Labeling and Testing supports label claim from Fiber to Finished Goods

Tight Controls
Physical Testing linked to QMS/ SAP

Brand Protection
Zero Risk for Mislabeling

Is it Real Egyptian?

Countries of origin

Himatsingka

Distribution

Retailer

Consumption

Disposal / Recycling

Zonal material extraction (for example cotton)

Spinning

Weaving / Knitting

Processing

Cut, make, trim

Shipping / Export

Retailer

Raw material extraction

Cultivation

Ginning
Can you prove it?
Certainty is Only a Molecule away
How CertainT Compares...

CertainT for Cotton Provenance

- Over 10 years in Cotton, with over 7,000 tests to verify fiber, yarn and finished goods in global supply chain
- Over 5 years from fiber-to-finished goods traceability
- Offers patented processes and science which has been used as evidence in court
- Custom built product and process profile based on fiber used in your supply chain
- Isotopes with Genotyping for Pima Cotton

Competitor System

❌ Entered market in 2016-2017, relatively new to cotton, focus on food
❌ Uses non-proprietary technology – third-parties can implement at will
❌ Limited to isotopes proving origin
❌ No genetic confirmation proving fiber content
Quality Management System = People + Process + Technology

- SigNature T
- Natural fingerprinting and fiberTyping
- Patented product and process
- Digital tracking from source to shelf

Isotopic and Trace Element analysis
Not commercial, Potential False +/-

Mass Balance (BCI)
No physical traceability; Paper trail

Barcodes/ RFID – can be copied

<table>
<thead>
<tr>
<th>Positioning/Value</th>
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<tbody>
<tr>
<td>Quality</td>
<td>Physical Testing</td>
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<tr>
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<td>Cotton Species</td>
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<tr>
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<td>Grown in</td>
</tr>
<tr>
<td></td>
<td>Genotyping</td>
</tr>
<tr>
<td></td>
<td>What and Where</td>
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<td></td>
<td>Genotyping + Isotopes</td>
</tr>
<tr>
<td></td>
<td>SigNature Tag in fibers + Genotyping + Isotopes</td>
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<td></td>
<td>Textile Traceability Transparency Trust</td>
</tr>
</tbody>
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How it Works
SigNature T Tagging
After harvesting, Egyptian cotton is misted with SigNature T DNA. This unique molecular tag guarantees the purity of our Egyptian cotton at every stage of its journey.

FROM OUR FARMS

GIN The raw Egyptian cotton fibers are spun into yarn, then tested for purity to ensure that our pure Egyptian cotton hasn’t been blended with lower-quality cotton fibers.

SPINNING

BALE The pure Egyptian cotton thread is woven into fabric, then tested again to ensure the fabric contains nothing but pure Egyptian cotton.

WEAVING

STORE The Egyptian cotton fabric is cut and sewn into the final product, then tested for purity one last time.

CUT & SEWN

TO YOUR HOME Sheets your family will enjoy pure Egyptian cotton quality and softness for years to come.
Real Time Information and Intelligence

TAG

Application-specific

TEST

In-Lab or In-Field

TRACK

Browser-based desktop or mobile
"The Best Cotton in the World Deserves the Best Systems"

- 100% Egyptian Cotton
- Tag: What, when, who, how, where, why
- Test: In continuous production; large volume of samples tested
- Track: From source to shelf with seamless IT system.

For your unique claim... a unique tag is created... Tag + Test + Track

Molecular Barcode

Traceability: Bulletproof system that provides forward and backward traceability.

Transparency: enhanced visibility, oversight and “peace of mind” in having seamless end-to-end system.

Trust: Mitigate Supply Chain Risk; High Quality Standards for all Egyptian Cotton products.
Traceability Begins with the SigNature T Bales
97,920 data points per day per gin

System Status

- Gin location
- Presence of cotton (flowing/not flowing)
- Amount of SigNature T being sprayed
- Date/time

Status of gin connections

Amount of SigNature T concentrate remaining

Bale production rate

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What is my Cotton DNA?

**INTRINSIC DNA in Cotton**

- **100% Pima Claim:**
  DNA test for Pima DNA (Gossypium barbadense) vs Upland (Gossypium hirsutum) DNA.

- Organic GMO or Non-GMO? DNA test for seeds, fiber and greige yarn.
Where does my cotton come from?

Stable Isotopes = Nature’s Fingerprint™

Patented Product + Process Fingerprint System
Identify a Unique “Fingerprint” in Cotton Fiber
Verified in Yarn + Fabric + Finished Goods

Your Supply Chain
Bale ID tagged (from gin system)
Bales “Conform/Not Conform”

Visibility
Transparency
Accountability
Measure and Manage

Bale ID Authentication
Yarn, Fabric, Finished Fabric Authentication

Bales Tagged v. Contract Tagged
Bales Request to Ship v. Bale Quality Conforms
Bales Request to Ship v. Lab Quality Conforms

Himatsingka
applied dna sciences
Forensic Authentication in India and the US
Cotton Provenance with Brand Assurance
Full End-to-End Traceability

<table>
<thead>
<tr>
<th>Traceability Solutions</th>
<th>Fiber at Farm</th>
<th>Baled Cotton at Gin</th>
<th>Yarn at Spinner</th>
<th>Fabric at Weaver</th>
<th>Finished Goods</th>
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Build Consumer Trust with CertainT
Making Better Lives Possible

Thank You