Beacon Biotechnology
Small company. Big science.

Approach to Personalized Medicine

Anywhere, Anywhen Testing™

Beacon Biotechnology LLC
12635 E. Montview Blvd.
Aurora, CO 80045

Fred Mitchell
T: 720.859.6116
F: 720.859.6123
E: fmitchell@beaconbiotechnology.com
W: www.beaconbiotechnology.com

New Concept?

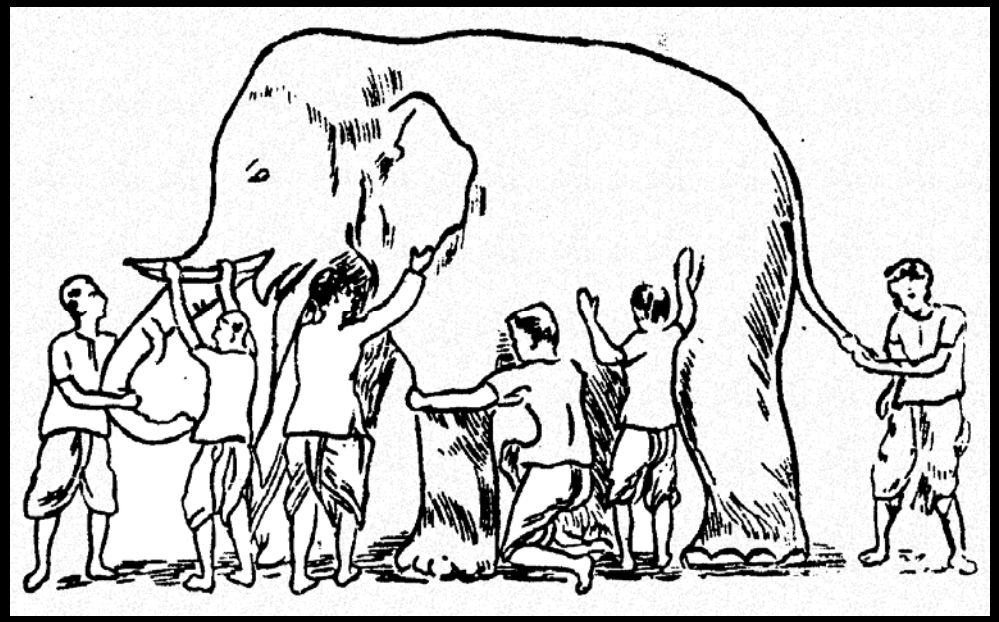
- Personalized Medicine
  - Ancient Chinese
  - Direct Observation

- Economic Incentive

Incomplete Picture

- Limitations of Technology

- Human Proteome
  - Plasma Proteins - ~ 205 approved lab tests
  - Represent about 1%



Approaches

- Proteomics
  - Phosphoproteomics
- Genomics
  - Full Sequencing
  - Genotyping
  - microRNA
- Potential Solutions for:
  - Cancer
  - Cardiovascular
  - Mental health
  - Pharma, development, therapy selection

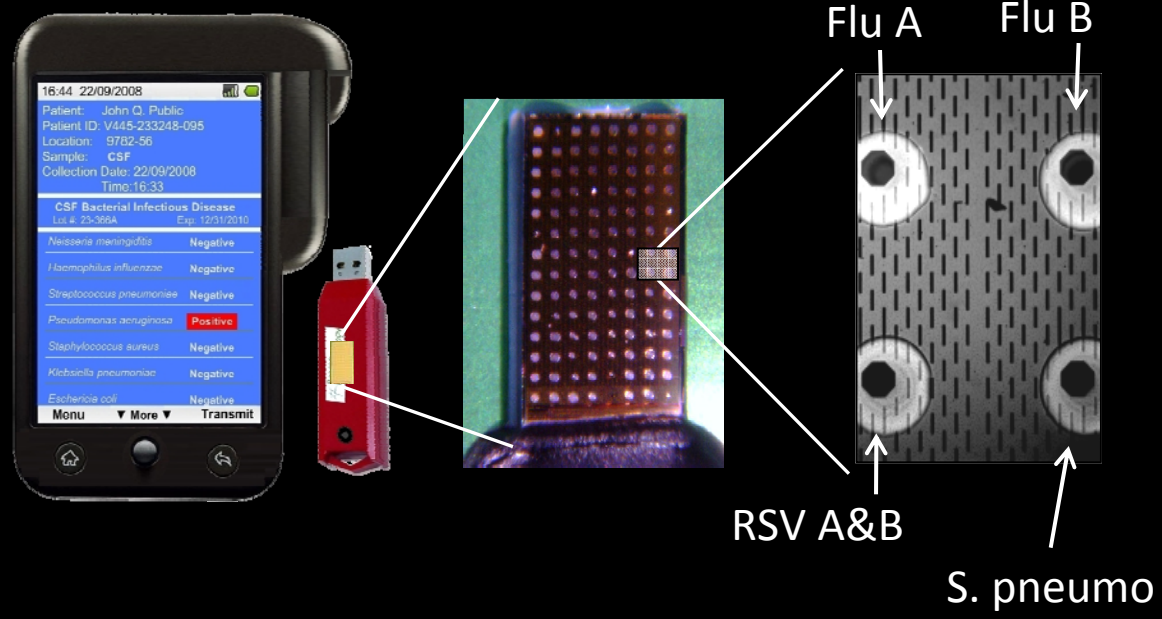
Economic Issues Drive Delivery

- Insurance (Federal & Private)
  - Medical Need, Efficacy
  - Short Window
- Self-pay
  - Boutique Medical Services
- Health System Burden
  - Ratio of physicians to patients
  - Teaching Moment

BrightSPOT Technology

BrightSPOT Detector

- 112 detectors/chip
- **40X better sensitivity**
- Antibody or nucleic acid based detection

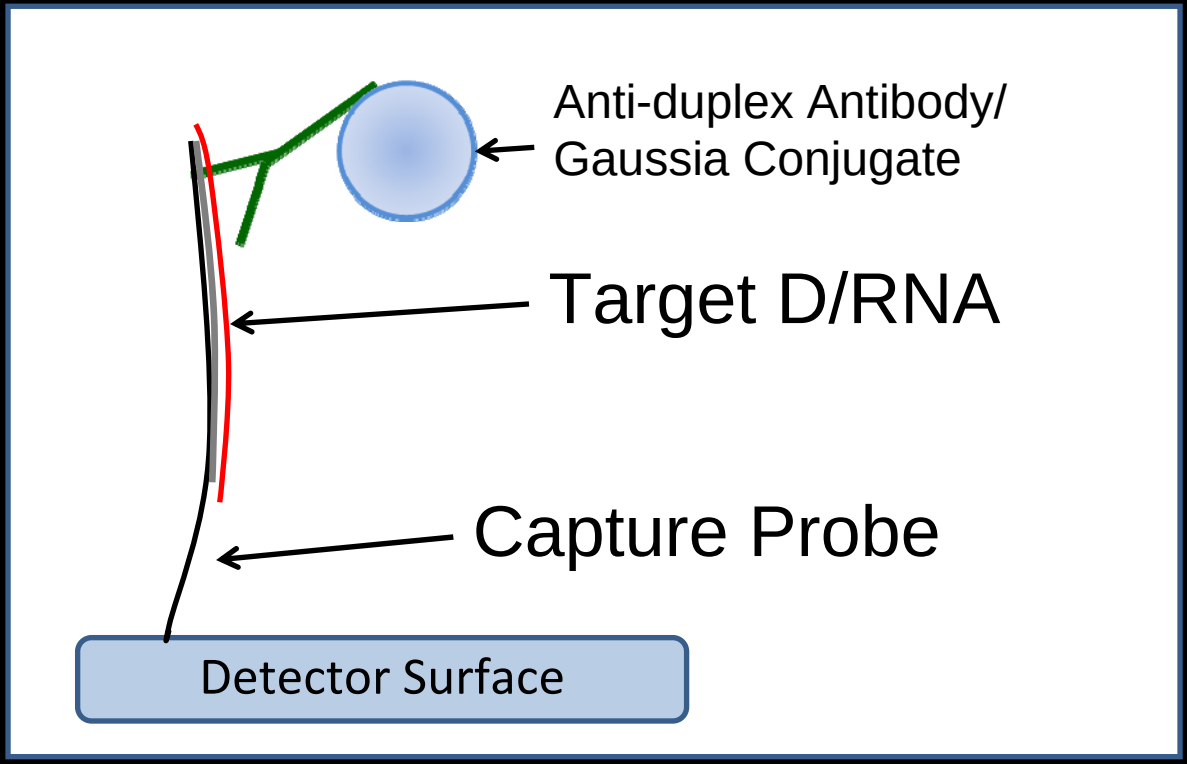


Gaussia luciferase signal

- Bioluminescent – biological light
- **1,000x brighter**

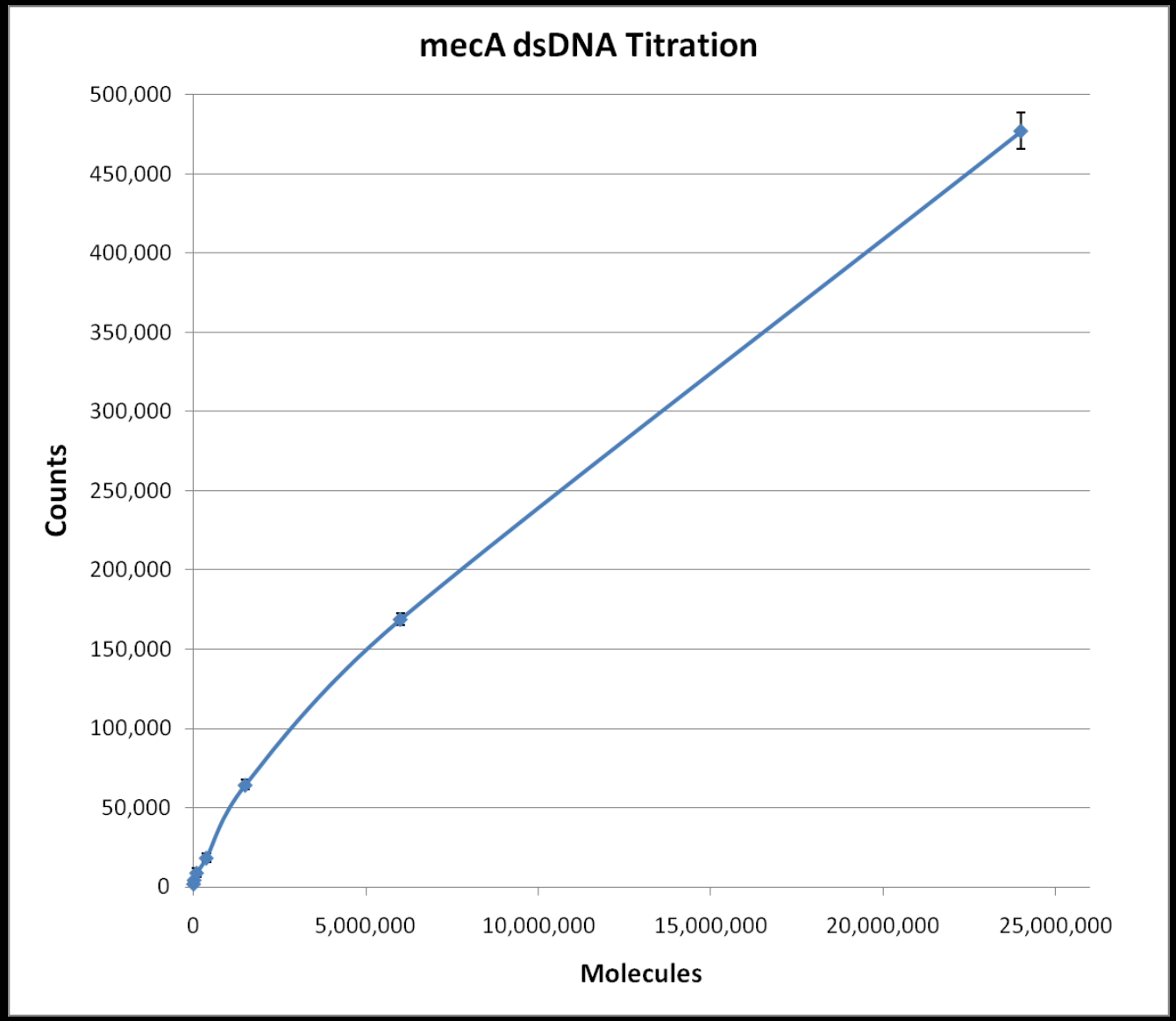
Gaussia princeps

Molecular Application



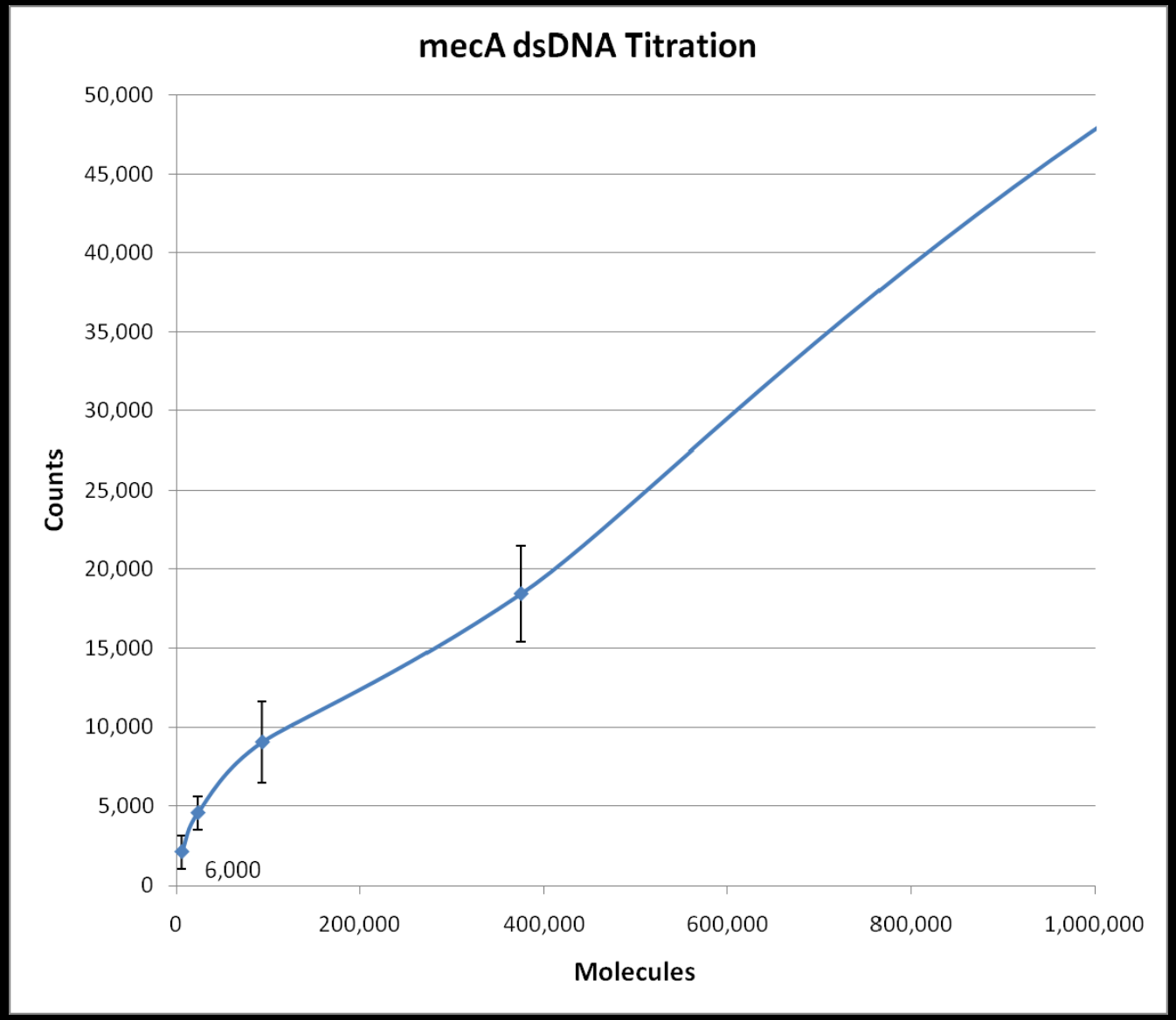
Device Sensitivity

- Pre-formed Hybrids
- 6k to 25M Molecules
- 4.5 Log



Device Sensitivity

- Pre-formed Hybrids
- 6k to 25M Molecules
- 4.5 Log

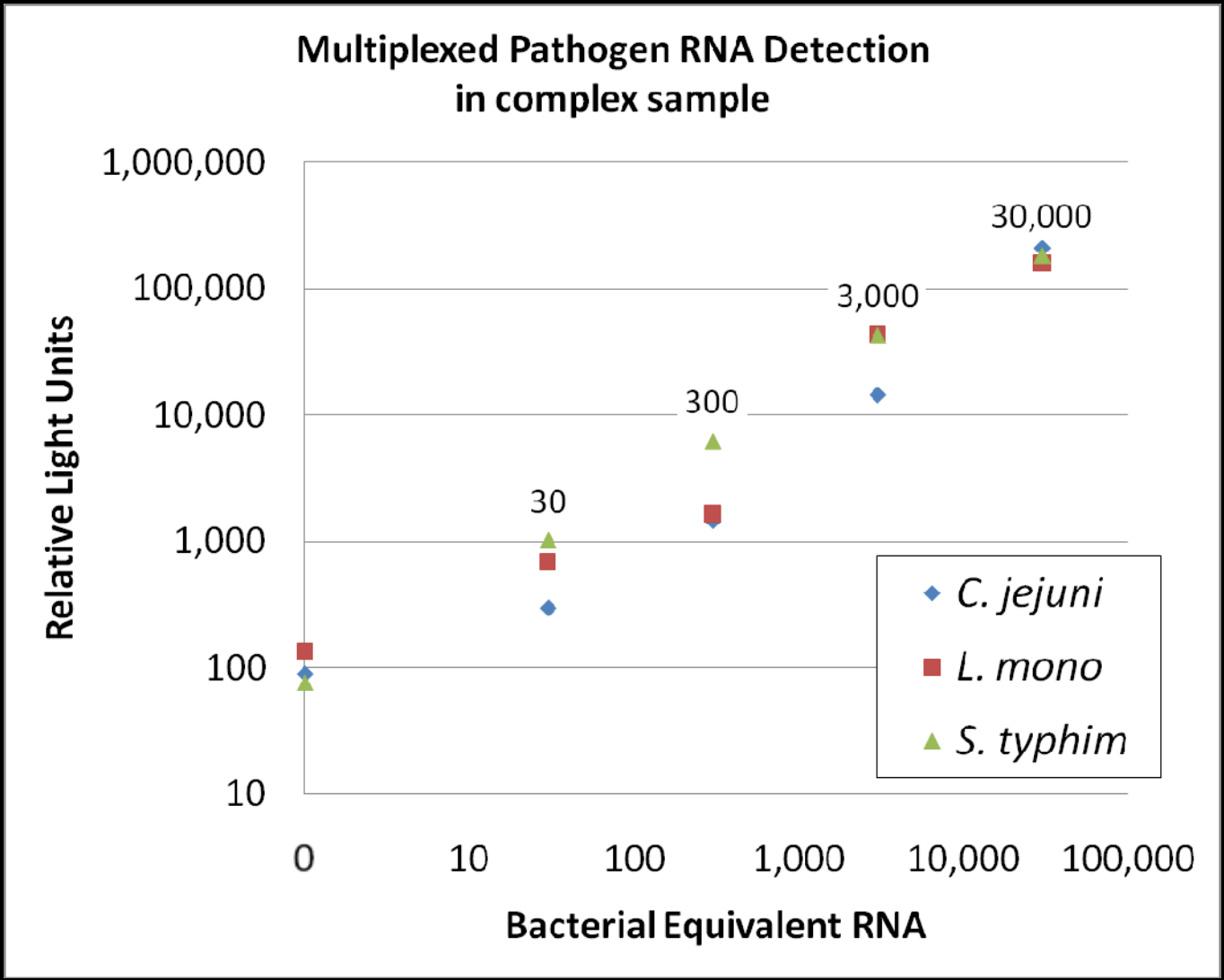


Bacterial NA Detection

- Complex Sample

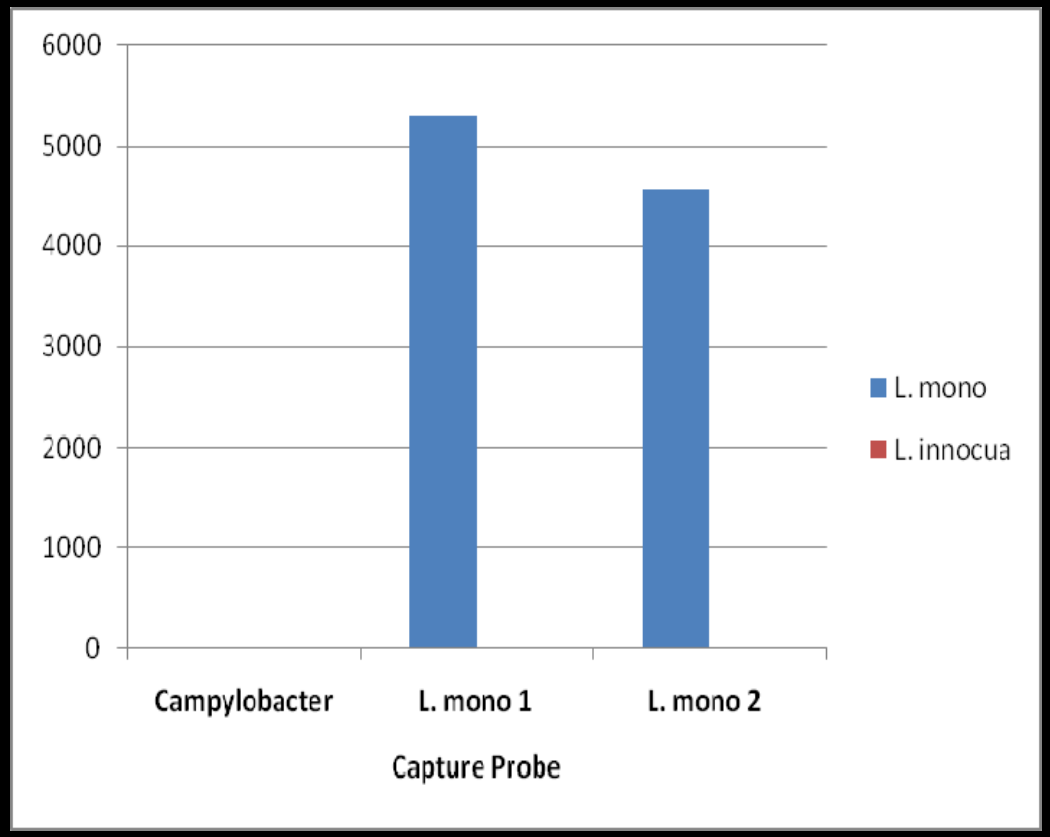
	RNA Concentration in Bacterial Equivalents				
Pathogen	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
S. typhimurium	0	30	300	3,000	30,000
L. monocytogenes	30,000	30	3,000	0	300
C. jejuni	300	30,000	30	3,000	0
C. freundii	60,000	60,000	60,000	60,000	60,000
Herring Sperm NA	10 µg/mL				

Bacterial NA Detection



Discrimination

- 25-mer capture
- 2 nt difference
- 15 nt separation



Beacon Biotechnology

Thank you…

Personalized Medicine

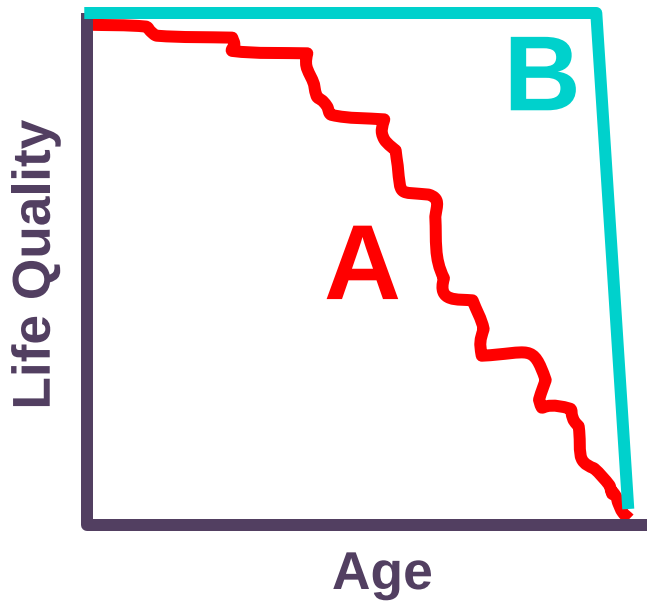
CBSA
April 28, 2011

Larry Gold
SomaLogic

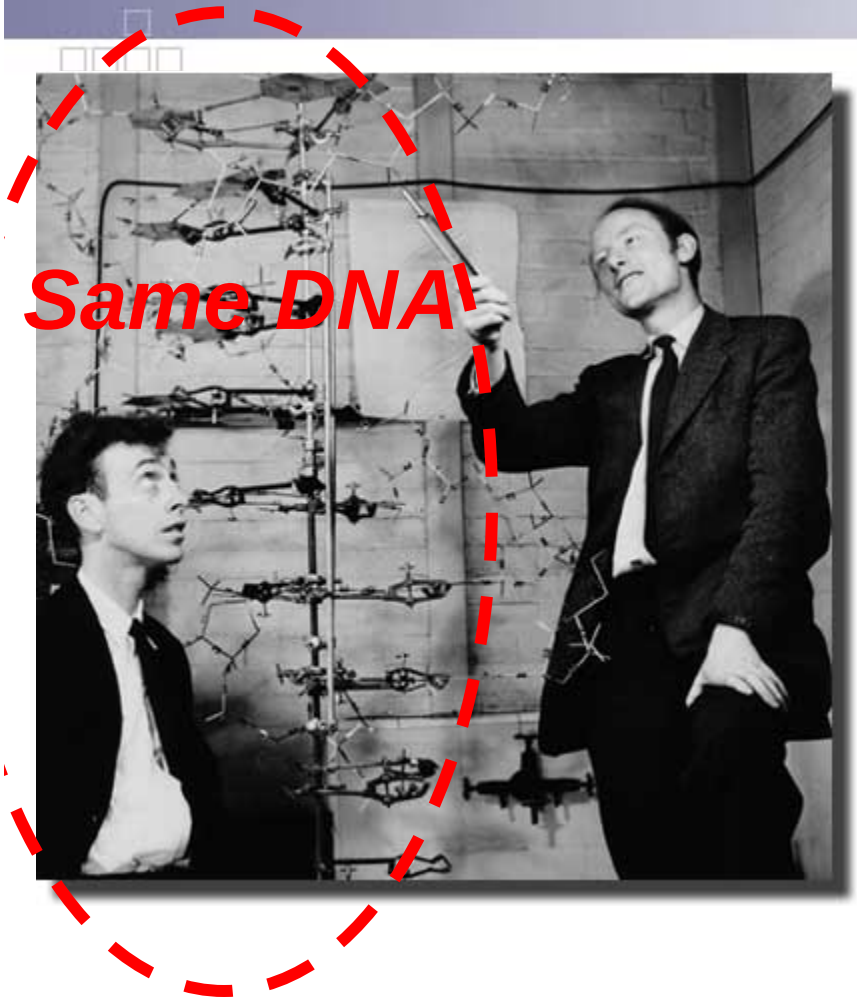
© 2000-2011 SomaLogic, Inc. All Rights Reserved.

The Twin Goals of Personalized Medicine: A Healthcare Transformation that…

Changes the approach to death from A to B and thus….*lowers healthcare costs while improving wellness*



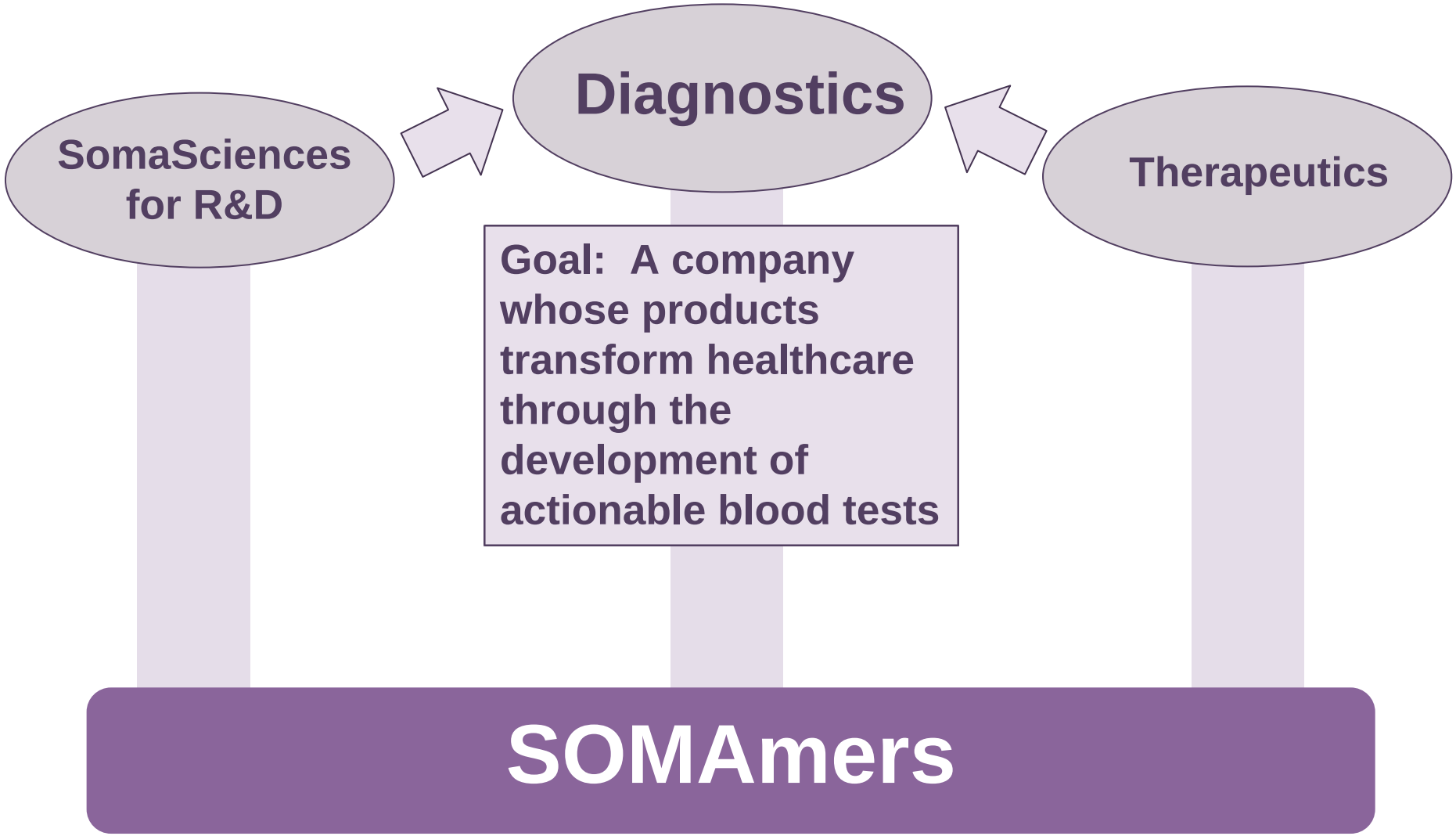
© 2000-2011 SomaLogic, Inc. All Rights Reserved.



SomaLogic Does Proteomics and NOT Genomics – "Actionable Diagnostics" Is about Extant Disease

© 2000-2011 SomaLogic, Inc. All Rights Reserved.

How Things Hang Together at SomaLogic



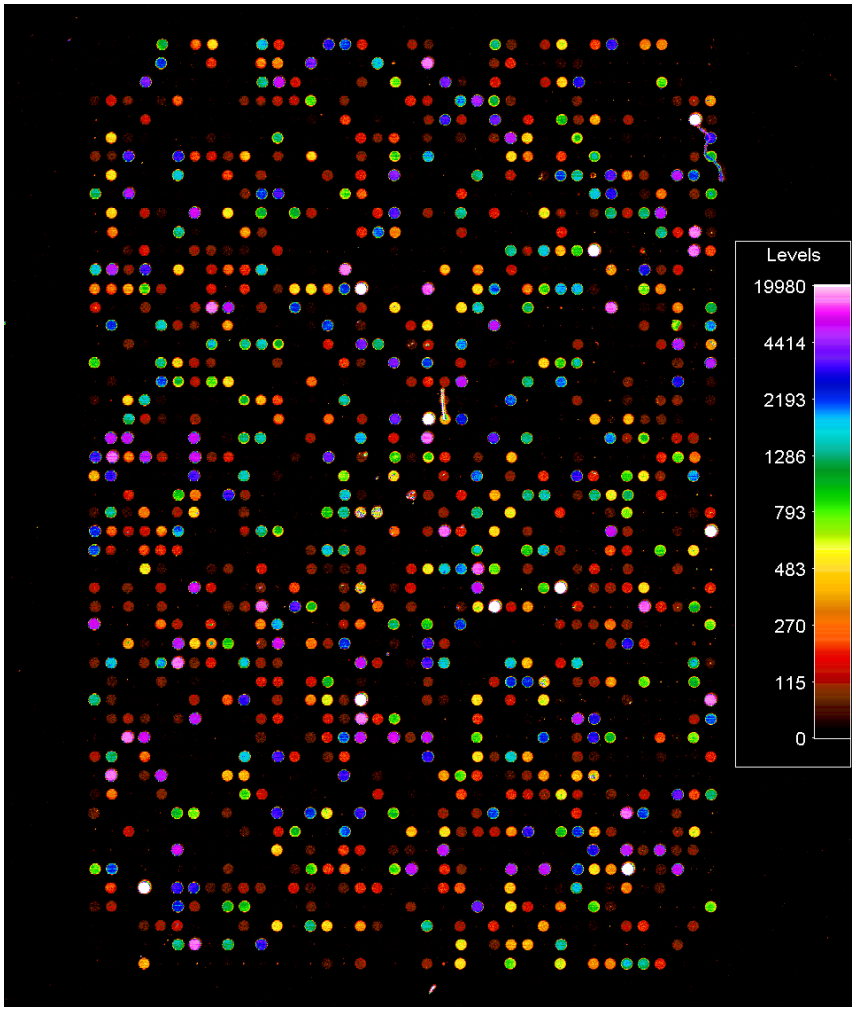
© 2000-2011 SomaLogic, Inc. All Rights Reserved.

What SomaLogic Does, Repeatedly

1. Obtain clinical plasma or serum samples from sick people and controls
2. Measure many proteins in every sample
3. Identify those proteins that go up or down in sick people (*the biomarkers*)
4. Use those proteins to build a diagnostic "classifier" using several different methods
5. Test the classifier on a "blinded" set of samples
6. Repeat for additional clinical questions…

© 2000-2011 SomaLogic, Inc. All Rights Reserved.

SomaLogic Measures Human Proteins in Blood: Each Feature Quantifies a Single Protein



© 2000-2011 SomaLogic, Inc. All Rights Reserved.

Lung Cancer Retrospective Clinical Trial

Study Design*: 1,326 serum samples from 4 clinical sites were assayed in *less than 2 weeks

Cases

- NSCLC Stages I-III
- 60% adenocarcinoma, 30% squamous cell carcinoma
- Samples collected prior to treatment

Controls

- Benign non-calcified pulmonary nodules
  - CT screening study participants and pulmonary clinic patients
- Long-term smokers, no evidence of cancer

985 samples used for biomarker discovery, algorithm training and cross validation

341 samples tested as a blinded verification set - they were unblinded by an independent 3rd party

© 2000-2011 SomaLogic, Inc. All Rights Reserved.

NSCLC Cancer Trial and the ROC

Experimental design

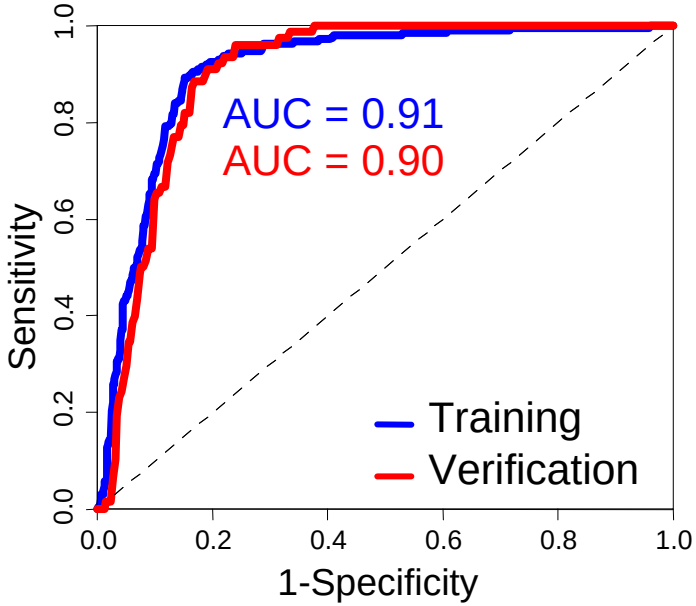
- Training: 213 cases compared to 772 controls
- Blinded Verification: 78 cases compared to 263 controls

Results

- 12 protein panel discovered
- Area under ROC curve of 90% for both training and blinded verification
- Sensitivity ~90% for Stage I disease, better than any available alternative
- Small-plex assay uses standard laboratory methods

Next steps

- Validate on independent EDRN sample set [n~400]
- Launch as LDT in 2011
- Discovery to product launch ~2 years



© 2000-2011 SomaLogic, Inc. All Rights Reserved.

The Pipeline

Lung, Pancreatic, Ovarian, and Bladder Cancer

Mesothelioma and Melanoma

ALS, Alzheimer's Disease

Parkinson's Disease

Cardiovascular and Metabolic Disease

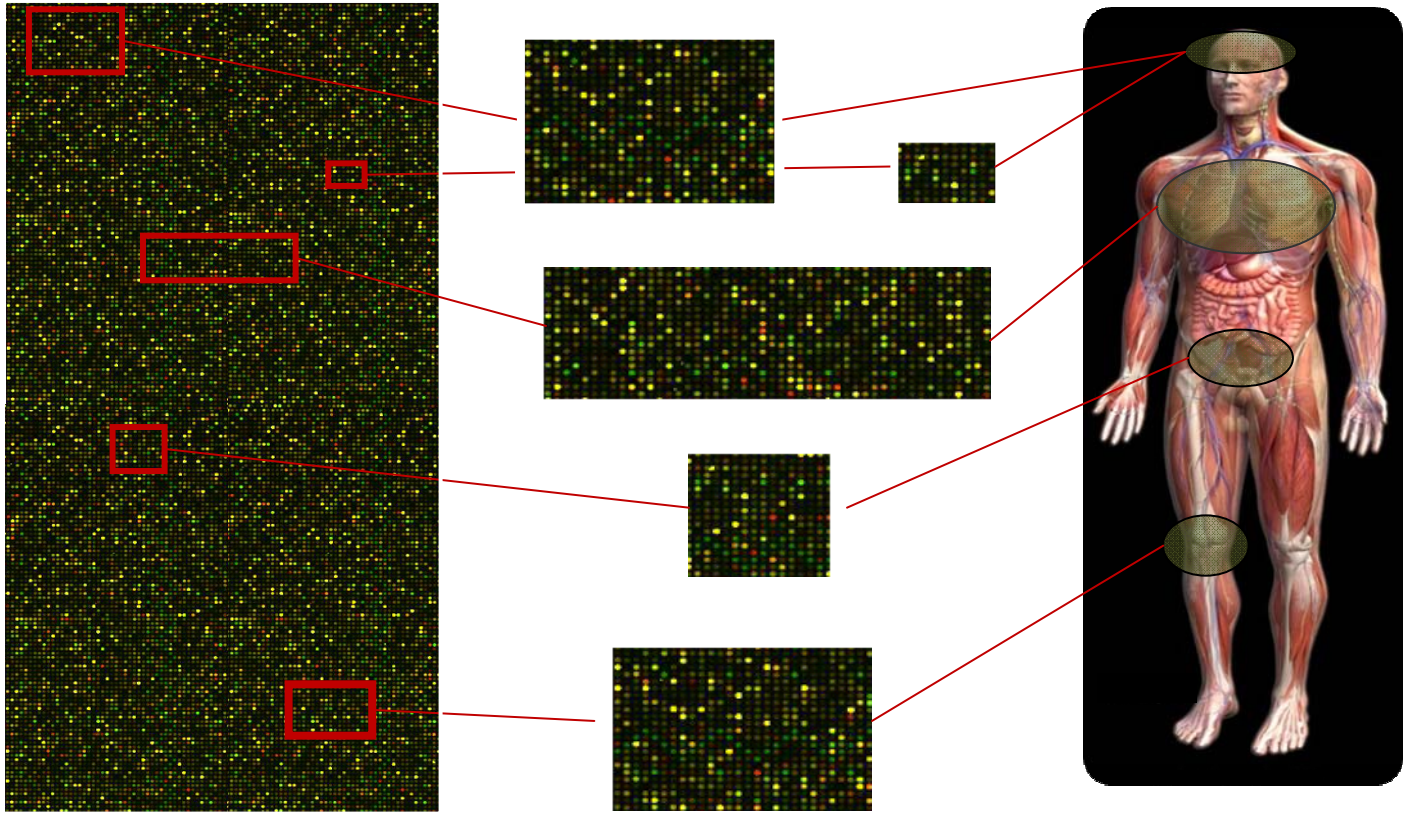
Kidney Disease

and so on…we have studied more than 10,000 human blood samples thus far…we know how to do this at scale…

© 2000-2011 SomaLogic, Inc. All Rights Reserved.

The Wellness Chip: Personalized Proteomics

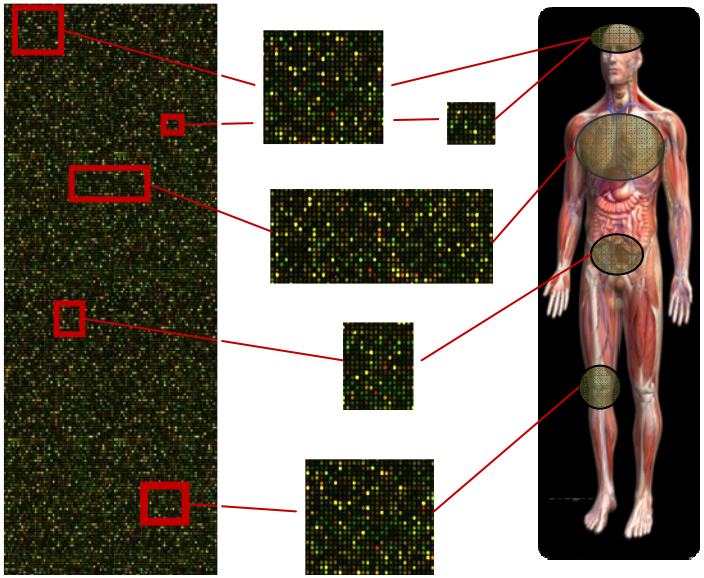
"A Picture of Health" - comprehensive life-long longitudinal and wellness monitoring with <u>actionable</u> results



© 2000-2011 SomaLogic, Inc. All Rights Reserved.

Thanks for Listening

Unlocking Biomarker Discovery



Improving Medicine and Healthcare

© 2000-2011 SomaLogic, Inc. All Rights Reserved.