



# QUALITY AND SAFETY TESTING

Frédéric BAR, Key Account Manager

b2  
b3  
b4  
b5

# Une histoire: l'origine de la vie

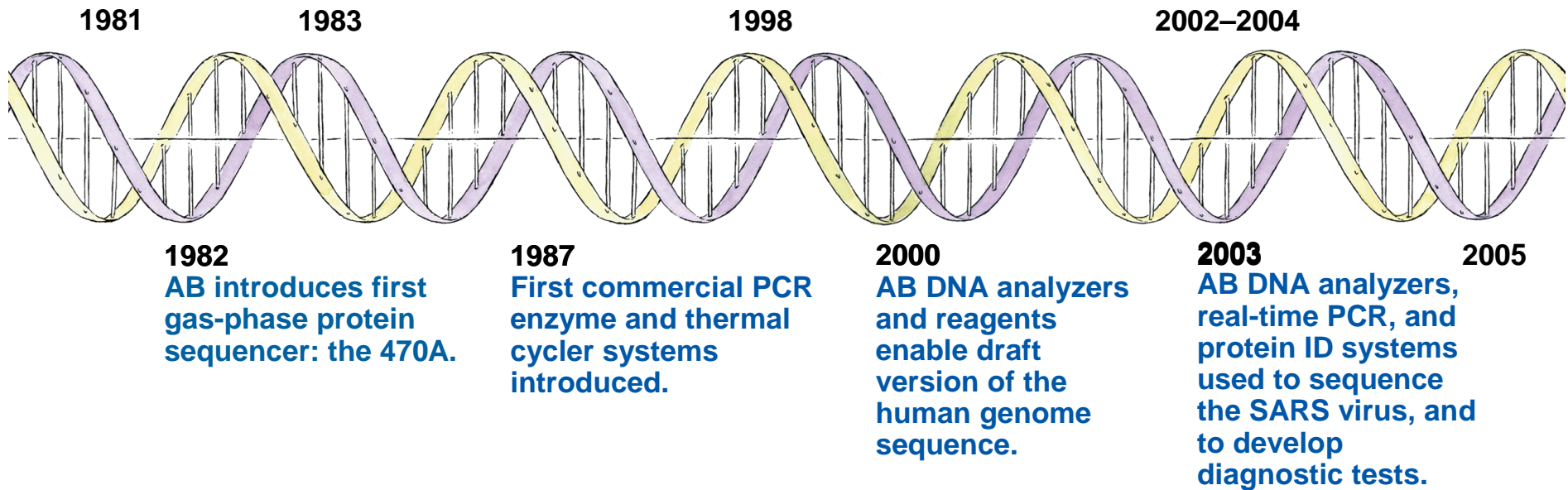
## Un saut: des technologies accessibles pour le contrôle de routine

**1981**  
Applied Biosystems is founded.

**1983**  
AB introduces 380A DNA synthesizer.

**1998**  
AB introduces ABI PRISM® 3700 DNA Analyzer: accelerating completion of human genome draft.

**2002–2004**  
AB DNA analyzers and reagents used to identify 30,000 human genes and discover 10 million+ unique SNPs.



## Diapositive 2

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- b2** Linda - I shortened the words....I really like this slide! Cathy  
burzikcm; 09/01/2005
- b3** burzikcm; 09/01/2005
- b4** burzikcm; 09/01/2005
- b5** Linda- I really like this slide...I just shortened it. Cathy  
burzikcm; 09/01/2005



# SOLiD™ Sequençage massif

# Applied Biosystems SOLiD™ System - Overview

**Ultra High  
Throughput**

Up to 4Gb per run

**Extremely  
Accurate**

99.94% System Accuracy

**Scalable**

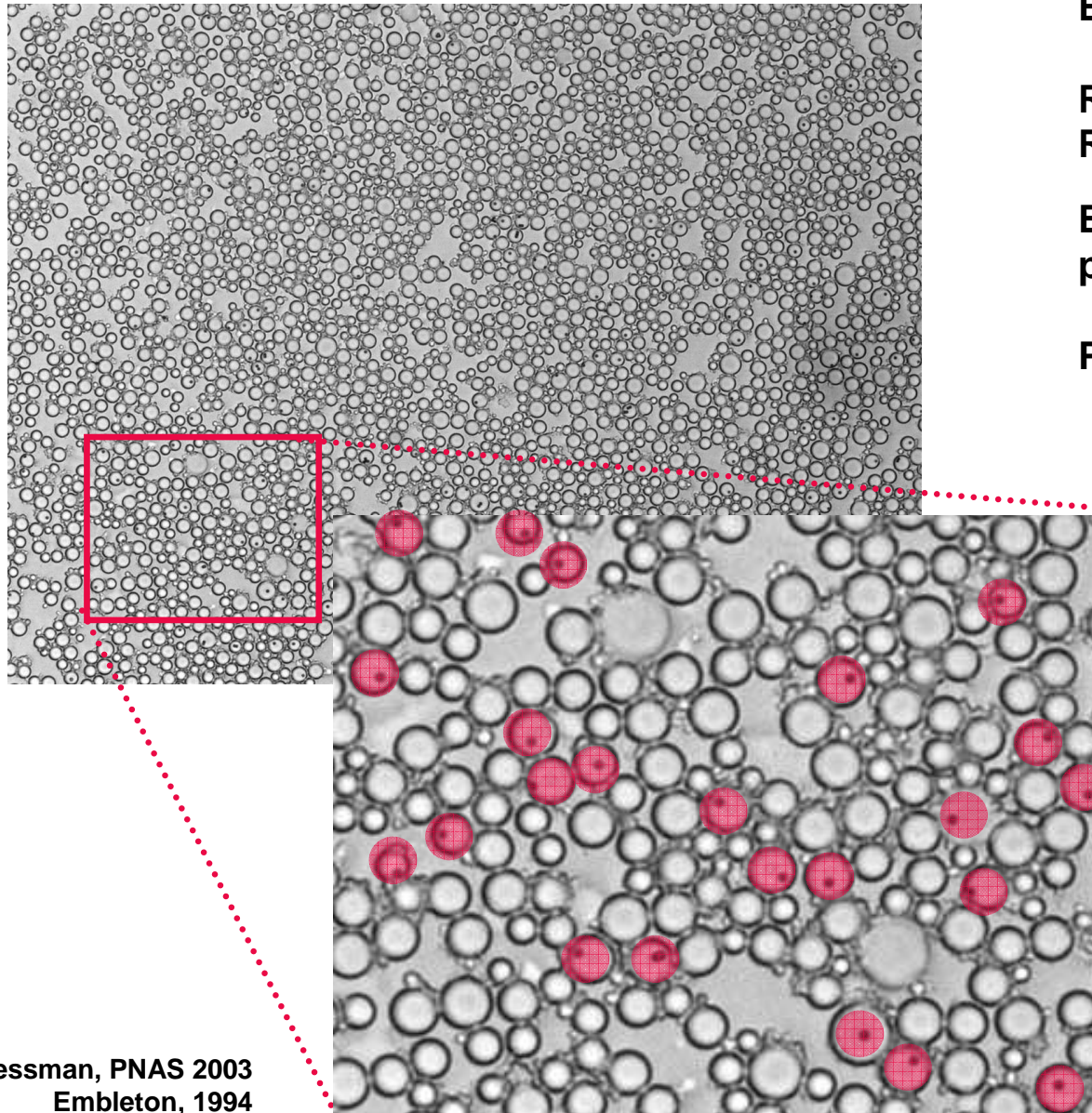
2 Independent Slides  
Up to 8 Segments on each

**Flexible**

Mate-Paired and  
Fragment chemistries



## SOLiD system: Amplification Clonale



### Emulsion Metrics

**Bead size:** 1  $\mu\text{m}$

**Reactor size:** 4  $\mu\text{m}$

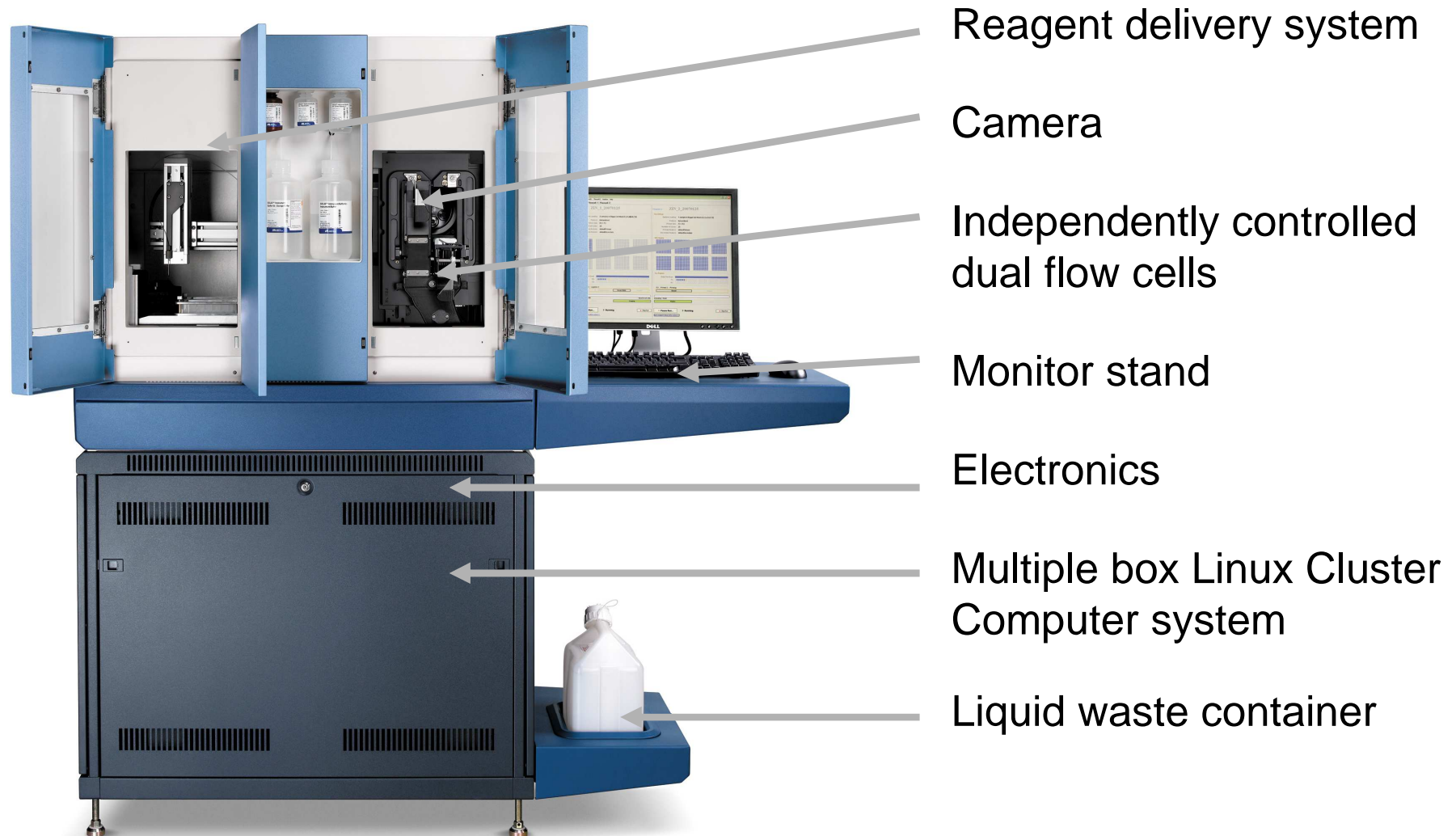
**Reactor volume:** 34 fL

**Beads / emulsion  
plate (96-well):** 2-4 x 10<sup>9</sup>

**Post Enrichment:** ~800M / plate



# Instrument Overview: what is familiar..



# Whole Genome Resequencing Microbial Organism

- Objective: to demonstrate the ability of SOLiD™ to resequence different strains of microbial organism to identify variation
- Experiment
  - Fragment and mate-paired libraries created
  - Sequenced on SOLiD™ System

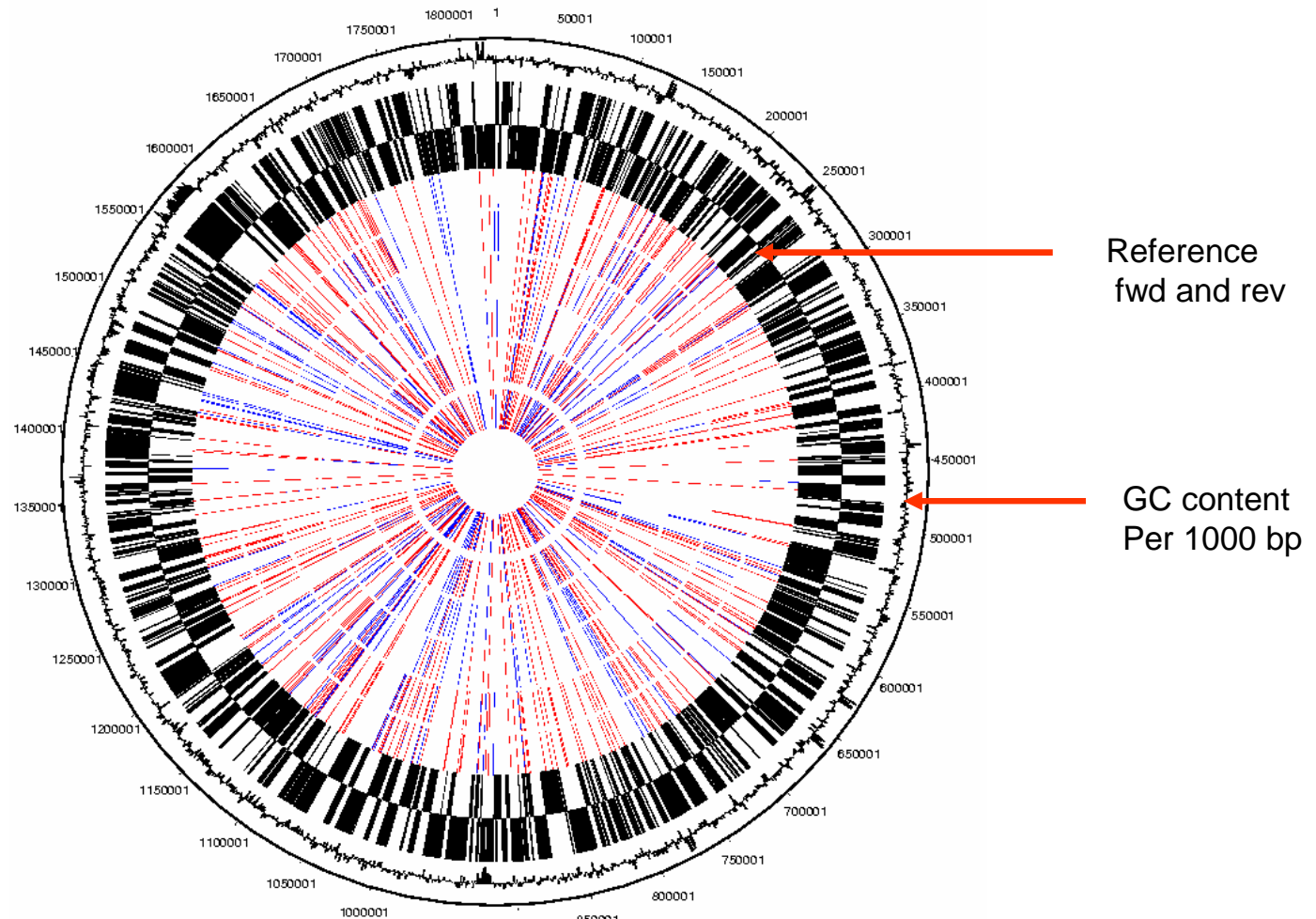
# Bacterial Variation Analysis

## SNP Identification across different *strains*

Red conf  $\geq 0.85$   
 Blue conf  $< 0.85$

From center outwards

1. Strain 1
2. Strain 2
3. Strain 3
4. Strain 4
5. Strain 5
6. Strain 6



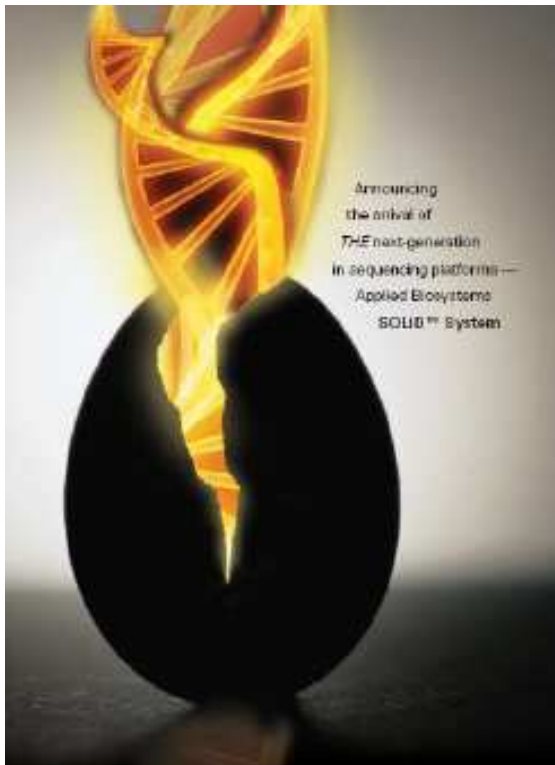
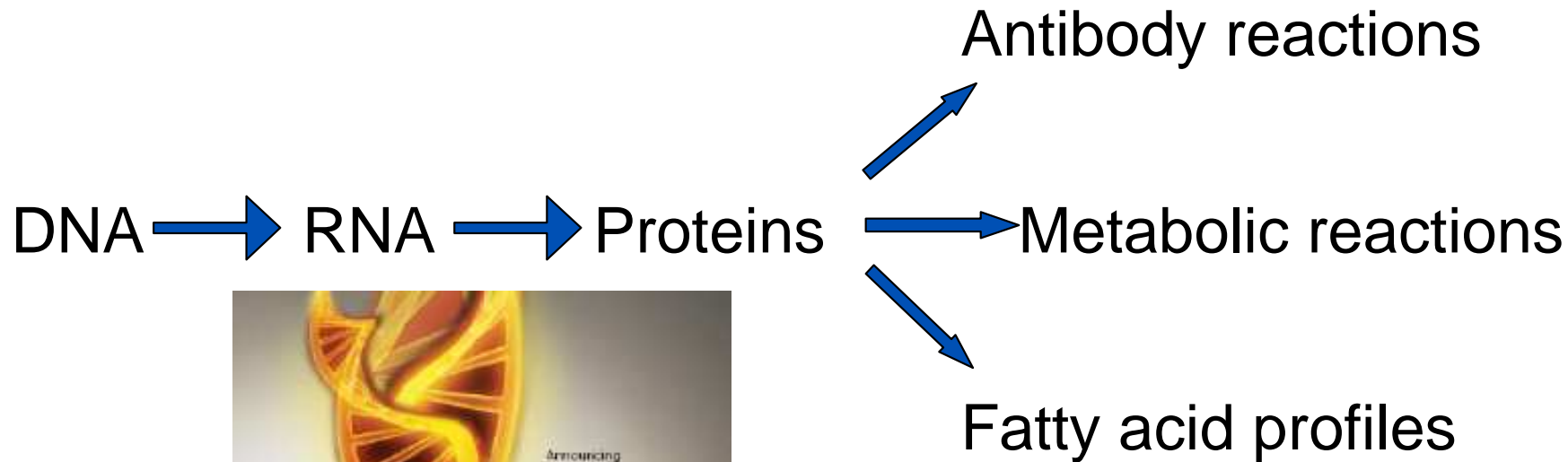
SOLID is able to detect SNPs throughout the genome regardless of GC content

A glowing orange DNA double helix structure is shown against a black background. The helix is composed of two intertwined strands connected by rungs, all of which are illuminated with a bright orange-yellow light, giving it a translucent, ethereal appearance. The structure is positioned diagonally across the frame, starting from the top left and extending towards the bottom right.

**To learn more visit:  
<http://solid.appliedbiosystems.com>**



# Why DNA testing?



**Genotypic** vs. **Phenotypic**

# De Pasteur à la PCR en temps réel

## Microbiologie Alimentaire

- 5 différents TaqMan® Pathogen Detection Kits:
  - *Listeria monocytogenes* (*hlyA* gene)
  - *Salmonella enterica* (*hilA* gene)
  - *Escherichia coli* 0157:H7 (*eaeA* gene)
  - *Campylobacter jejuni* (*ccoN* gene)
  - *Enterobacter Sakazakii*

## Environnement

- *Legionella spp et pneumophila*

## Pharma et Cosmétique QC

- *Staphylococcus aureus*
- *Pseudomonas aeruginosa*
- ADN résiduel
- Mycoplasme

## Vins et Bières

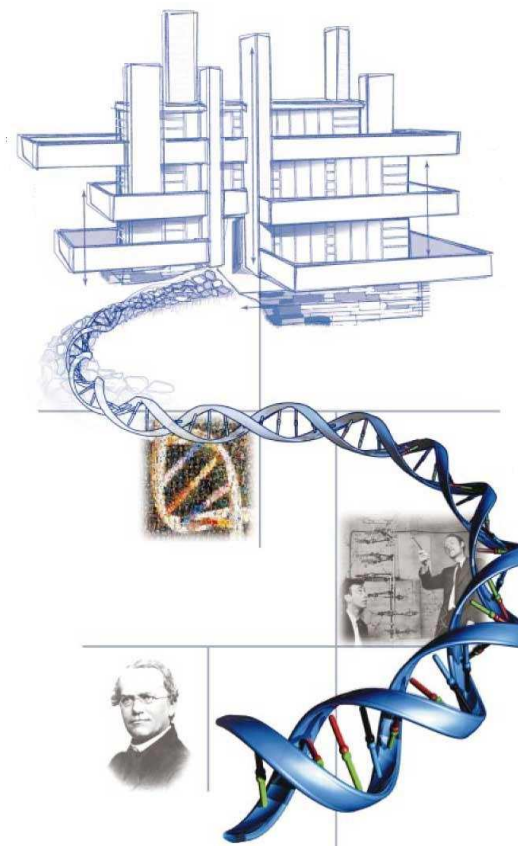
- *Brettanomyces (Prédel)*

## Virus

- Grippe Aviaire H5N1
- Rotavirus, Norovirus 1 2 et HAV

## Biosecurité

- 4 différents TaqMan® Pathogen Detection Kits
  - *Francisella Tularensis*
  - *Bacillus anthracis*
  - *Brucella spp.*
  - *Yersinia pestis*





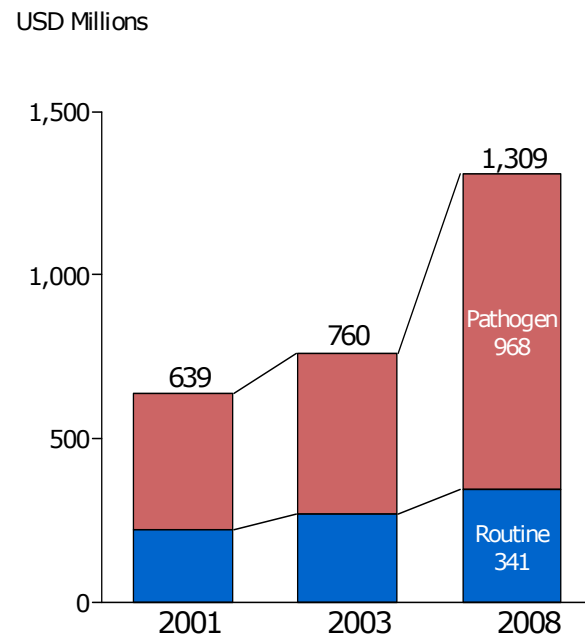
# Food Quality Testing

Frédéric Bar

Key Account Manager

# Food Pathogen testing market

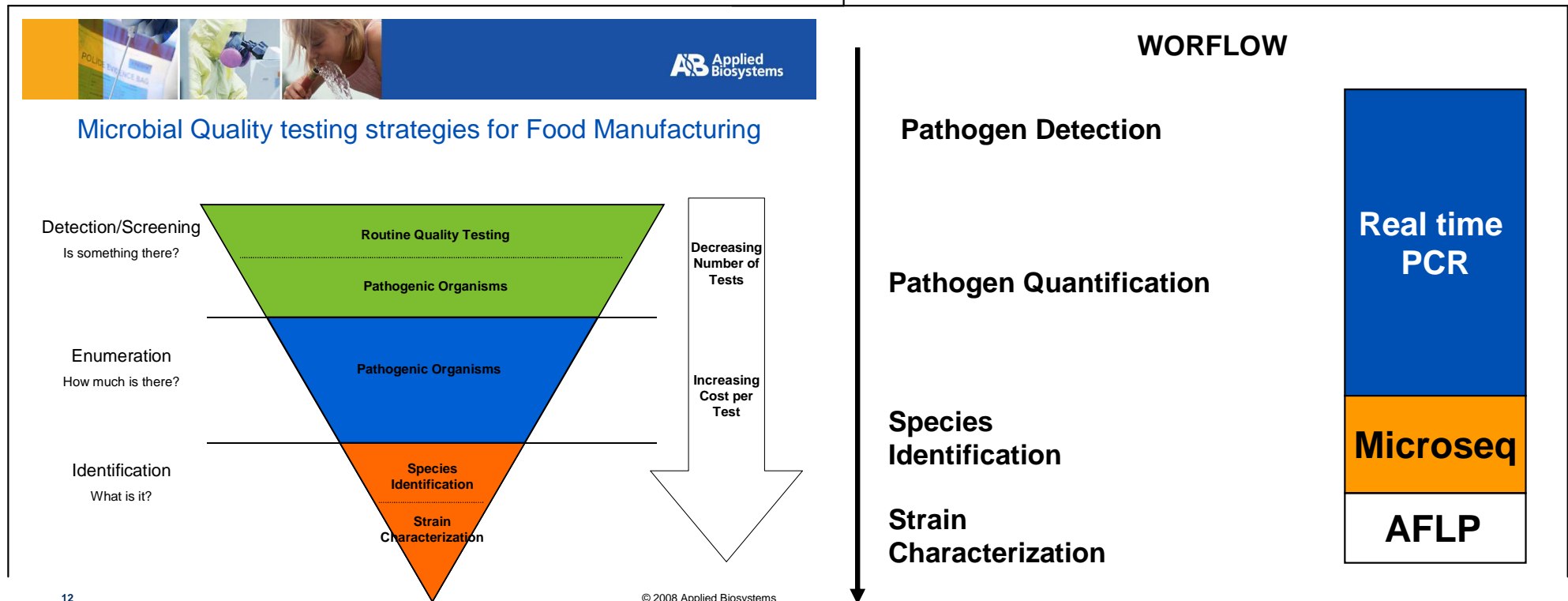
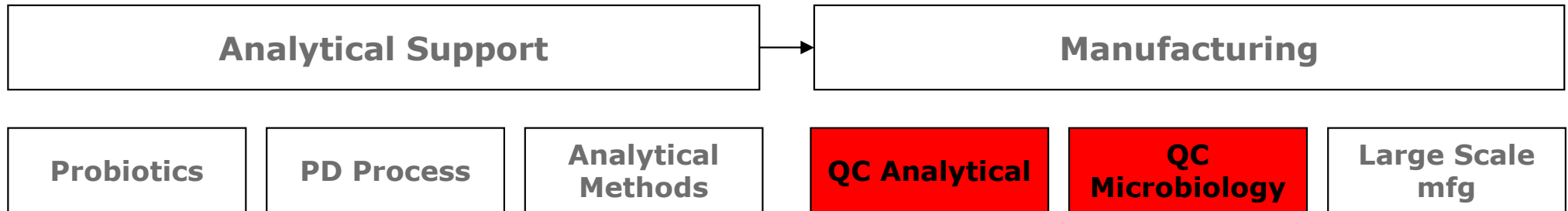
## Market Value of Food Testing



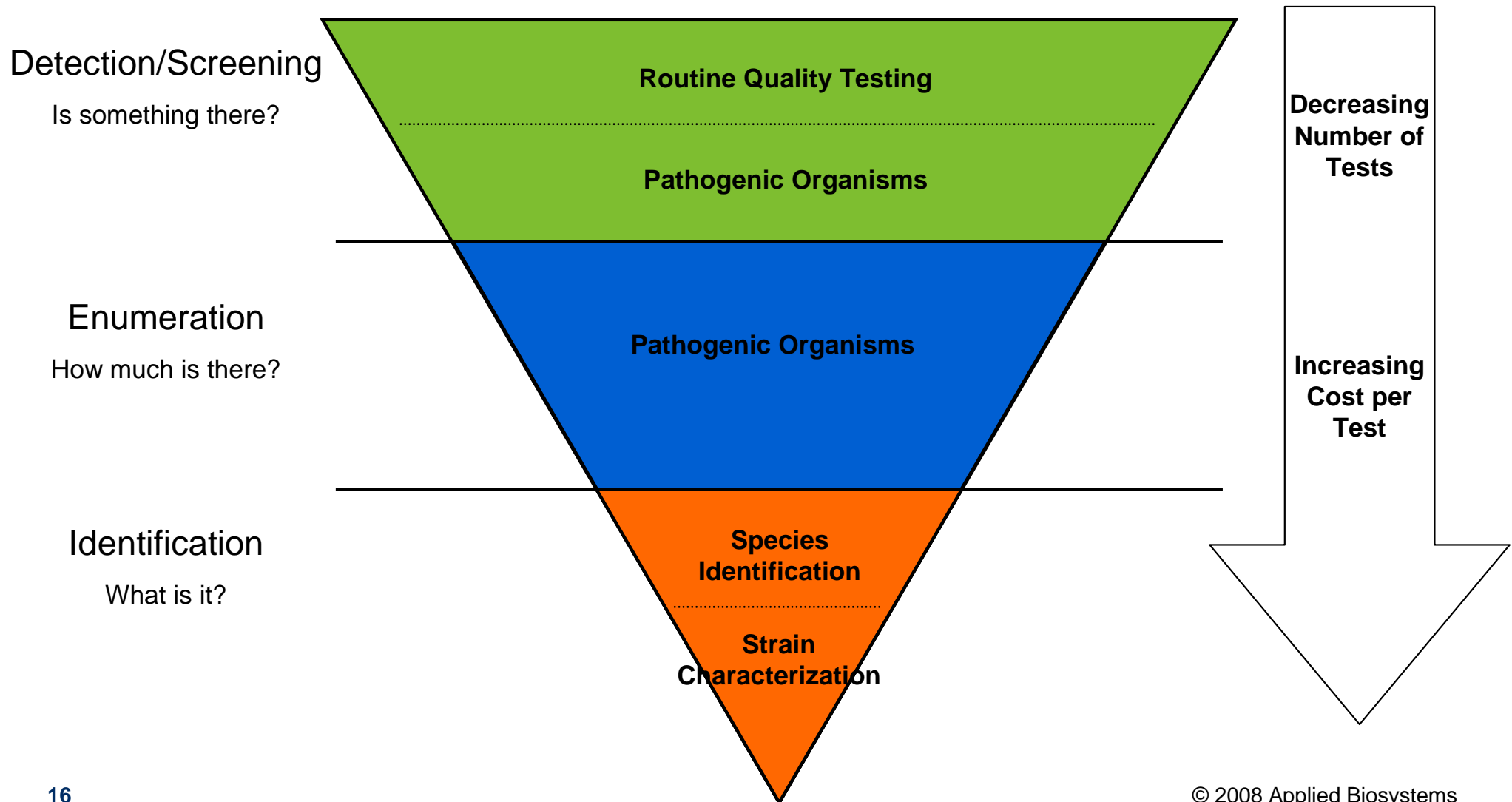
## Market size and growth

- In 2003 the market size for food pathogen testing was \$490M
- \$100M (20%) is comprised of molecular methods.
- Molecular methods are the fastest growing of all methods used for pathogen testing and are expected to grow to over \$360M in 2008 (2003-2008 CAGR = 29%).

# Microbial Quality testing strategies for Food Manufacturing

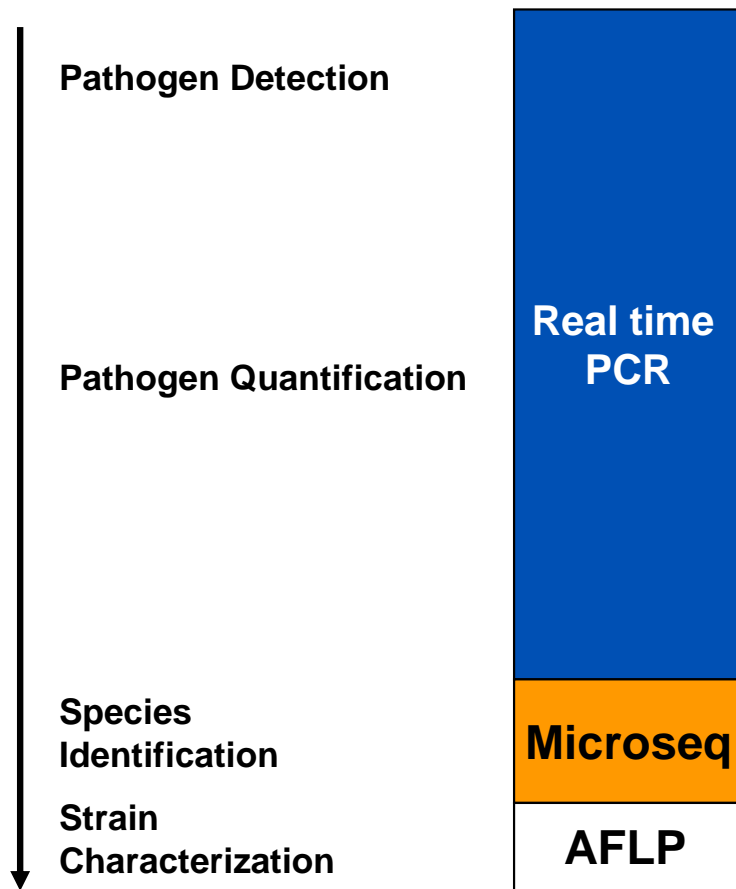


# Microbial Quality testing strategies for Food Manufacturing



# Solution supplied by Applied Biosystems to cover the complete workflow

## WORFLOW



## Routine testing

- 10 different TaqMan® Pathogen Detection Kits:
  - *Listeria monocytogenes* (*hlyA* gene)
  - *Salmonella enterica* (*hilA* gene)
  - *Escherichia coli* 0157:H7 (*eaeA* gene)
  - *Campylobacter jejuni* (*ccoN* gene)
  - *Enterobacter Sakazakii*
  - *Staphylococcus aureus*
  - *Pseudomonas aeruginosa*
  - *Rotavirus, Norovirus 1 2 et HAV*

## Enumeration

- *Legionella spp et pneumophila*

## Identification

- *3000 Validated Bacteria, yeast and fungi*



# Gmo Testing

Frédéric Bar

Key Account Manager

# Custom Plate – Dried TaqMan® assays

- Assay spotted plates



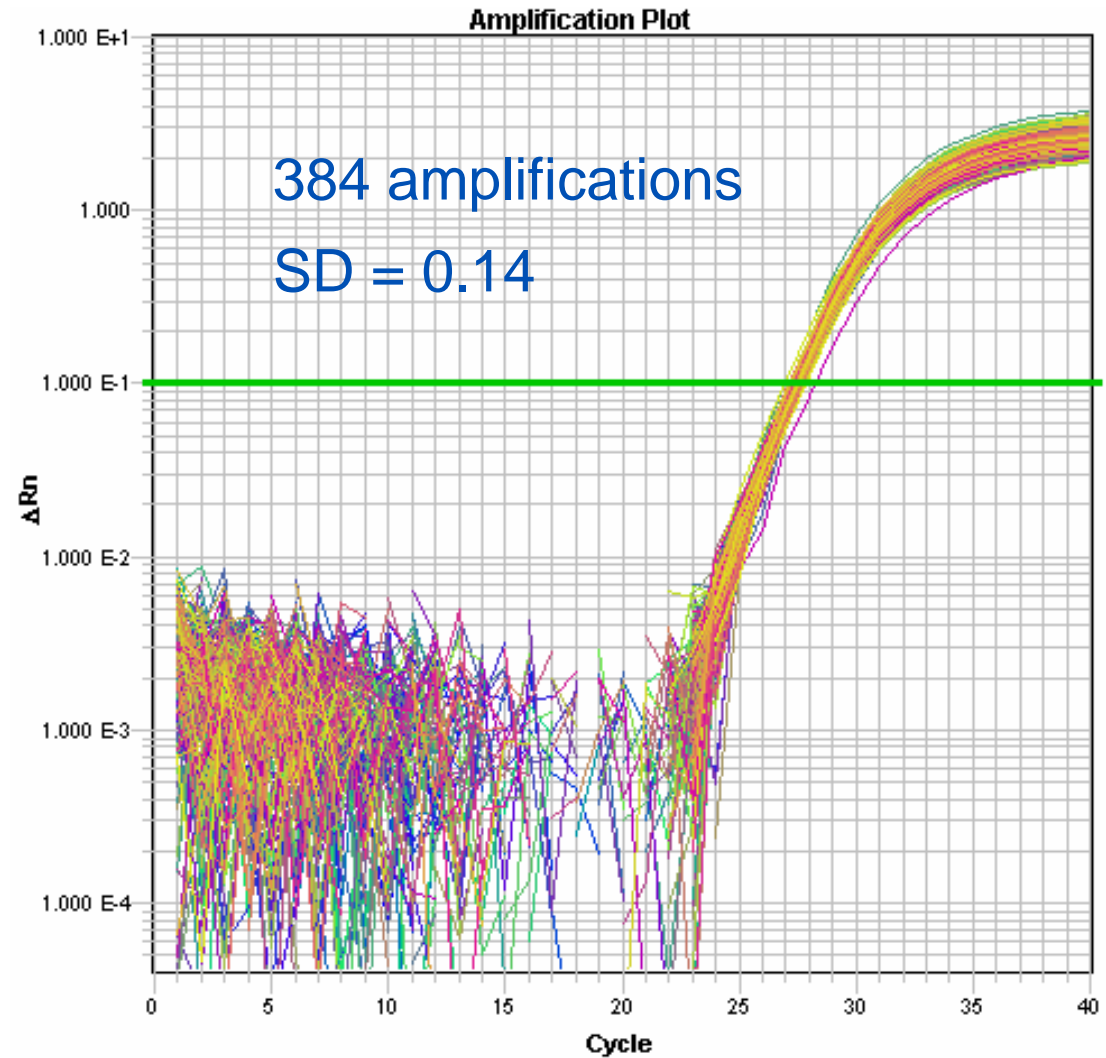
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
A	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
B	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
C	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
D	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
E	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
F	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
G	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
H	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
I	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
J	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
K	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
L	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
M	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
N	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
O	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U
P	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U	U

- Simplified procedures

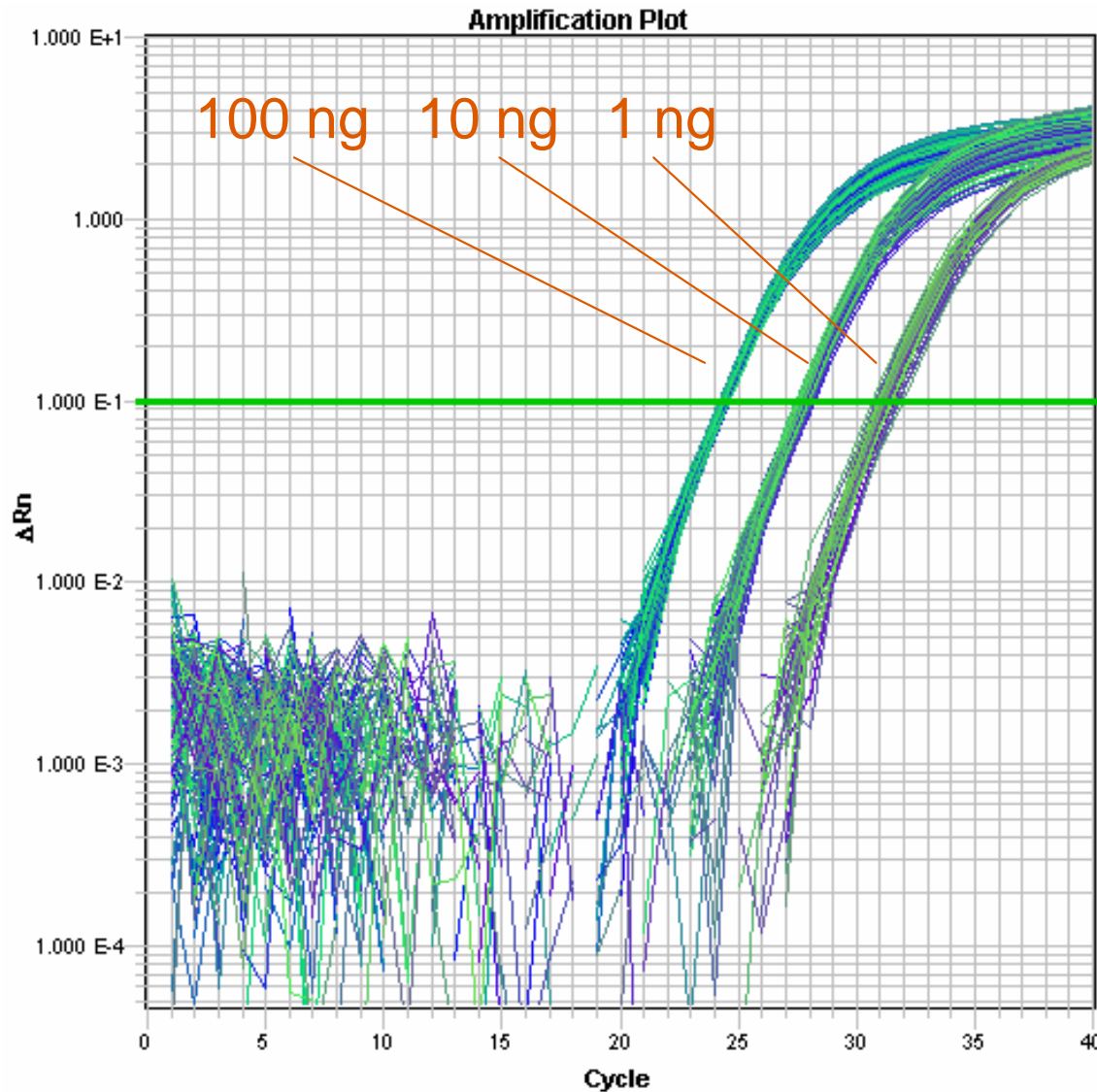
- Less errors
- Less labour
- More standardized

# Precision

- Single assay spotted in 384 wells
- 10 ng of plant DNA plus PCR Master Mix per well
- 10 ul reaction volume
- Adding reagent with multipipet, no mixing



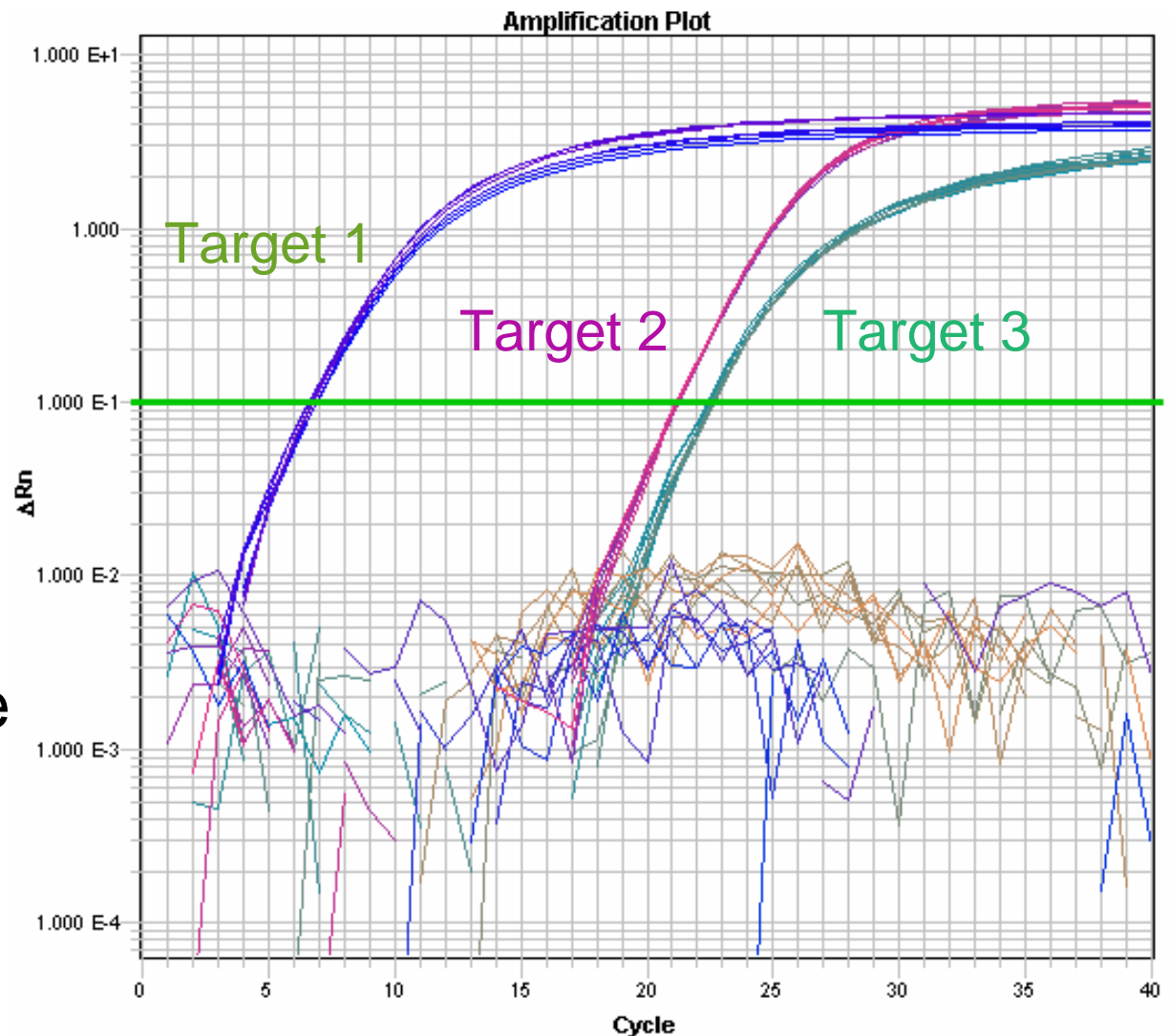
# Linearity



- Identical assay spotted
- 100 – 10 – 1 ng of plant DNA plus PCR Master Mix per well (96 replicates each)
- 10 ul reaction volume
- Adding reagent with multipipet, no mixing

# Multiple Targets

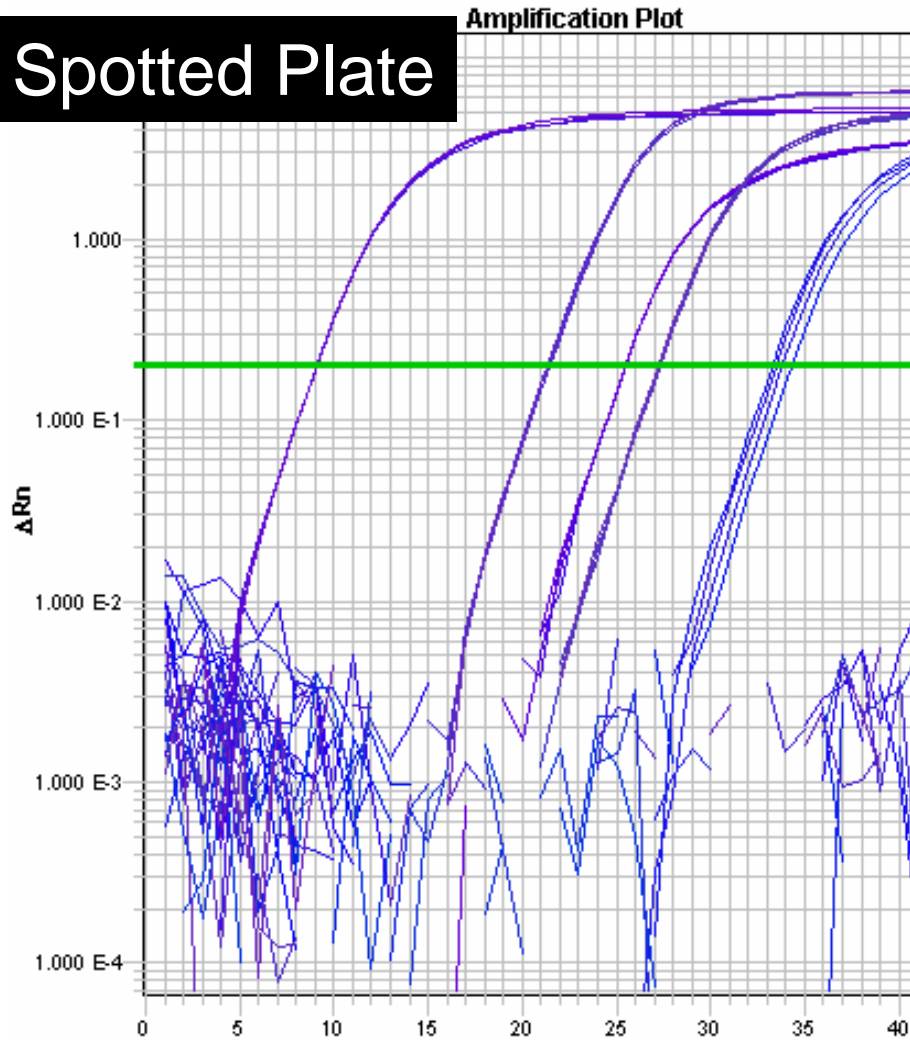
- Several assays spotted in individual plate columns
- Adding reagent/DNA mix with multipipet, no mixing
- 10 ul reaction volume



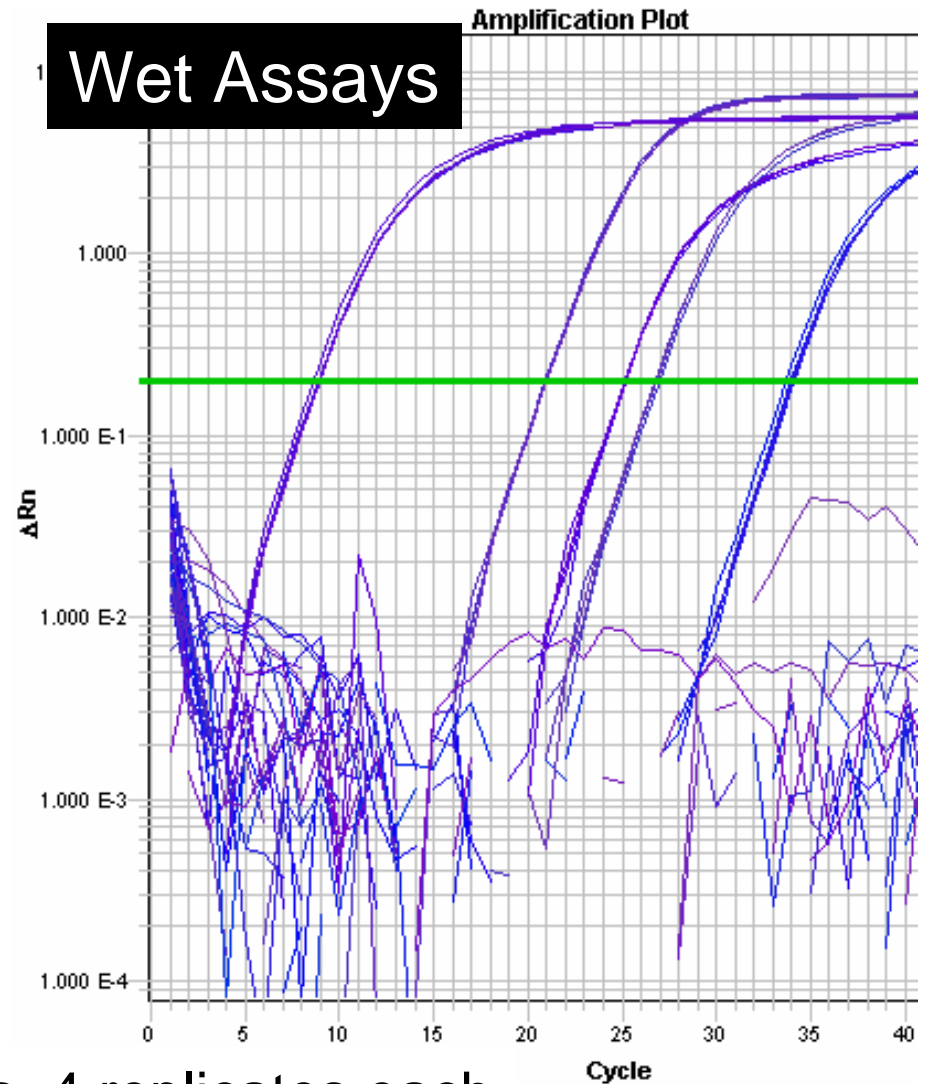


# Performance Spotted Plate vs. Wet Assays

**Spotted Plate**



**Wet Assays**



5 different assays, 4 replicates each

# Performance Spotted Plate vs. Wet Assays

