



Celera Diagnostics' Perspective

International Symposium on Reference Materials for Genetic Testing

**Michael A. Zoccoli, Ph.D.
Vice President of Development
Celera Diagnostics**

November 30, 2005



Industrial Uses of Reference Materials

- Reagent and Assay Development and Optimization
- Assay Run Suitability
- Quality Control Testing
- Product Demonstrations/Posters
- Performance Comparisons



Fragile X Product Concept

Adult female carrier and newborn screening

- Co-amplification of repeat and sex-determining targets
- Detects normal allele and premutation carriers with high specificity
 - Determines allele copy number for homozygous normal females
 - Repeats up to 200-230 (cover premutation region for FXTAS)
- Analysis on ABI PRISM[®] 3100 capillary electrophoresis platform
 - Sizing of normal repeats and determination of copy number/gender
 - Sizing of premutation repeats
- Reflexes non-normals to diagnostic assay or Southern blot

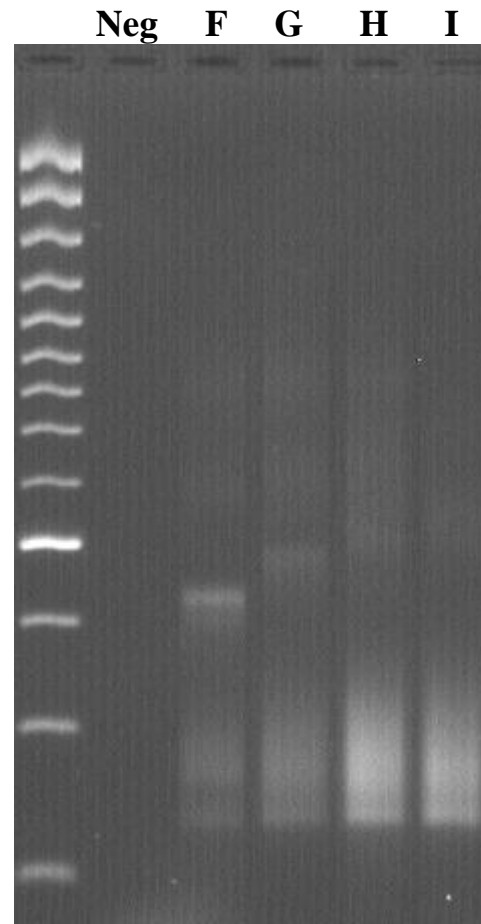
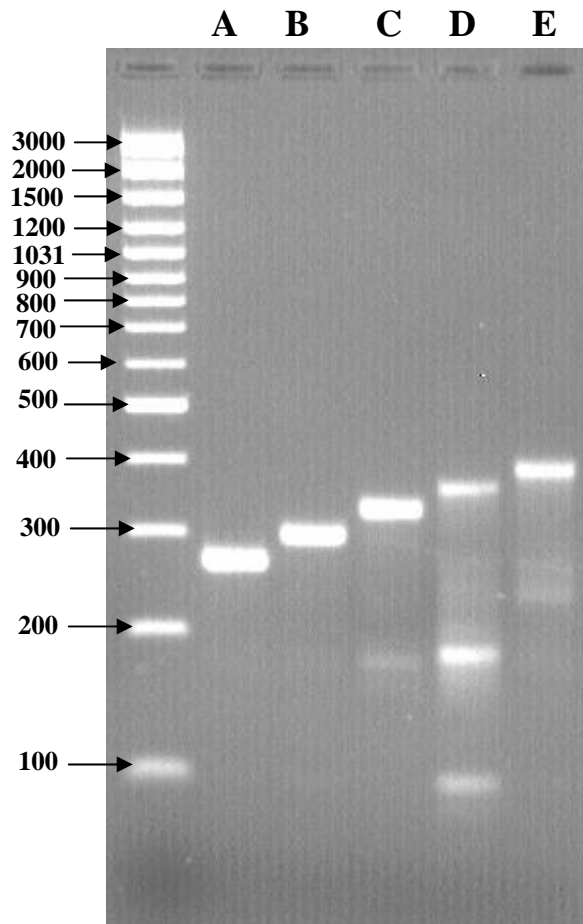


Fragile X Reference Needs

- Important Repeat Ranges
 - Normal 5-44 Repeats
 - Gray Zone 45-55 Repeats
 - Pre-Mutation 56-200 Repeats
 - Full Mutation >200 Repeats
- Decision Points
 - 44-45
 - 55-56
 - 199-200
- Nice to Have
 - Samples spaced between 56 and 200



NIST standard (SRM 2399) amplified with CDx FX Reagents



A_ Component A_ Female, 20 / Full mutation

B_ Component B_ Male, 30

C_ Component C_ Female, 41 / Full mutation

D_ Component D_ Male, 51

E_ Component E_ Male, 60

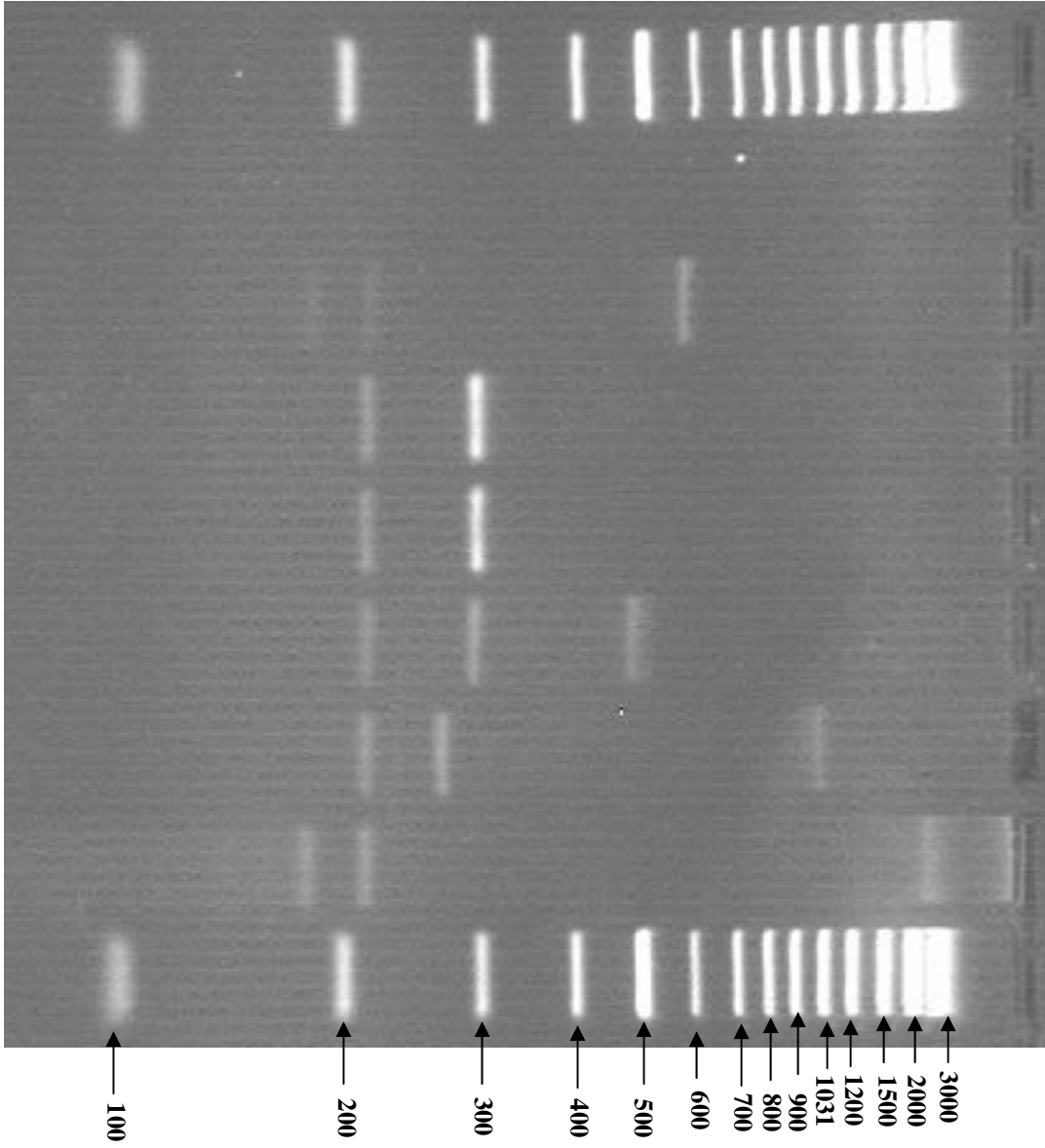
F_ Component F_ Male, 73

G_ Component G_ Male, 93

H_ Component H_ Male, 96

I_ Component I_ Male, 118





Neg

**Male
118 Repeats**

**Female
30 / 30 Repeats**

**Female
29 / 30 Repeats**

**Female
29 / 90 Repeats**

**Female
20 / 240 Repeats**

**Male
645 Repeats**

100

200

300

400

500

600

700

800

900

1031

1200

1500

2000

3000



CF CE Mutation Panel

- ACMG Recommendations

G85E	R117H	621+1 G>T
711+1 G>T	R334W	R347P
A455E	I507del	F508del
1717-1 G>A	G542X	G551D
R553X	R560T	1898+1 G>A
2184 delA	2789+5 G>A	3120+1 G>A
3659 delC	R1162X	3849+10 kb C>T
W1282X	N1303K	5T
7T	9T	I506V
I507V	F508C	

- Additional Ethnic Mutations

394 delTT	1078 delT	R347H
3905 ins T	3876 delA	V520F
S549R	S549N	I148T
2183 AA>G		



Expanded CF Panels

- US some customer preference for expanded panels
- In Europe
 - Countries want their populations covered
 - Panels sufficient to cover 85-90% of mutations in resident ethnic groups
- Most of these additional mutations don't have reference materials available
- Synthetic controls can fill some of the gaps

