For families struggling with the diagnostic odyssey

Recommend the new standard in chromosomal microarray analysis (CMA) testing

CytoScan® Dx Assay
Unrivaled performance. Results that matter.

For In Vitro Diagnostic Use

FDA-cleared
The prevalence of developmental disabilities across all racial, ethnic, and socioeconomic groups in US children is 13.87%\(^1\). Recent reports indicate 1 in 33 babies born in the US have congenital anomalies.\(^2\) Developmental delay / intellectual disability (DD/ID) is frequently accompanied with one or more congenital anomalies or dysmorphic features. These children with special needs can have lifelong challenges, including various medical conditions as well as difficulties with physical movement, learning, and social interaction.

Early intervention is key to providing better outcomes for children with special needs. Despite this, typically, diagnosis of developmental delay in children does not occur until they have reached four years of age.\(^3\) Certain intellectual disabilities are diagnosed much later, often when the child has entered elementary school.

Establishing an underlying diagnosis early can better inform healthcare providers and families of prognosis, recurrence risk, and comorbidity information, all of which have implications beyond medical treatment. However, finding a diagnosis can be an arduous journey, and opportunities for taking early action are often lost during this so-called “diagnostic odyssey.”

While environmental factors and nutritional deficiencies are known causative factors, the largest specific etiology of ID is genetic.\(^4\) When patient history and physical examination do not suggest an obvious syndrome, CMA is recommended as a first-line test to aid in the diagnostic evaluation of ID by multiple medical societies including \(^5\),\(^6\),\(^7\):

- American Academy of Neurology (AAN)
- Child Neurology Society (CNS)
- American College of Medical Genetics (ACMG)

Medical society guidelines also recommend CMA as a replacement to traditional karyotype and fluorescence in situ hybridization (FISH) because of:

- Greater sensitivity
- Higher resolution
- Genome-wide capability
- Greater diagnostic yield

CytoScan® Dx Assay is the first FDA-cleared whole-genome diagnostic test to aid clinicians in identifying the underlying genetic cause of developmental delay, intellectual disability, congenital anomalies, or dysmorphic features in children.
Whole-genome coverage
Designed for today and the future

CytoScan Dx Assay provides the highest density, whole-genome coverage to deliver higher resolution than karyotyping and more comprehensive coverage than FISH.

- Includes 2.69 million markers for copy number (CN) analysis
  - 750,000 bi-allelic single-nucleotide polymorphism (SNP) probes
  - 1.9 million non-polymorphic markers
- Ensures all genes are covered

Intellectual disability might present itself as the only manifestation of a disease or may be associated with other manifestations causing a clinical syndrome. Techniques like karyotype, FISH, and array CGH (aCGH) will miss clinically relevant aberrations.

Case #1: Previously missed clinically relevant aberrations can now be identified.

- A 14 year-old female with microcephaly, mild right exotropia, mild ID, ADHD, and a family history of ID presented to the clinic.
- Previous testing including aCGH, karyotype, FISH for 22q11, and FMR1 was normal.
- CytoScan Dx Assay identified a 1.66 Mb heterozygous gain of chromosome 3q29.
- These microarray findings, in conjunction with the clinical evaluation, led to the diagnosis of 3q29 microduplication syndrome, ending the diagnostic odyssey for this family.

References
9. CytoScan Dx Assay clinical trials.
Improved diagnostic yield

Gain an incremental 12.5% diagnostic yield beyond traditional techniques with CytoScan Dx Assay, allowing for accurate detection of numerous chromosomal variations of different types, sizes, and genomic locations.

In addition to identifying copy number changes, CytoScan Dx Assay is capable of detecting allelic imbalances and copy neutral aberrations (e.g., LOH) which can be associated with uniparental disomy (UPD) or consanguinity, both of which may pose increased risk for autosomal recessive conditions.

Case #2: The power of high resolution detects small aberrations.

- A 2 year-old male with speech delay, DD, broad nasal bridge, failure to thrive, and abnormal gait (dragging of the left leg) presented to the clinic.
- Previous testing including aCGH, karyotype, FISH for 7q11, and FMR1 was normal.
- CytoScan Dx Assay identified a **156 kb heterozygous deletion** of chromosome 16p11.2.
- These microarray findings, in conjunction with the clinical evaluation, led to the diagnosis of Floating-Harbor syndrome.

Case #3: SNP probes are informative for copy neutral aberrations such as LOH.

- A 7 year-old female with overgrowth, speech delay, learning disability, fine motor delay, seizures, and a wide mouth presented to the clinic.
- aCGH testing was normal.
- CytoScan Dx Assay identified a 79.69 Mb region of LOH on chromosome 15q.
- These microarray findings, in conjunction with the clinical evaluation, led to the diagnosis of Prader-Willi syndrome.
Why is FDA clearance important?
Hear from the experts

“We have noticed a significant decrease in the number of insurance denials, written appeals, and peer-to-peer requests for CMA testing since offering the FDA-cleared assay.”

Sean Hofherr, PhD, Laboratory Director
Children’s National Medical Center

“With CytoScan Dx Assay, our patients have the added assurance that the microarray testing they receive has been held to strenuous quality control measures. They know it is being performed and interpreted by professionals with the training and accreditation necessary to ensure accurate results, and they can trust the answers it provides.”

Lori Bassett, MS, CGC
Greenwood Genetic Center

“It has been beneficial not only to our patients but also to our physicians and genetic counselors who spend a huge amount of non-billable time obtaining authorization.”

Sean Hofherr, PhD, Laboratory Director
Children’s National Medical Center

Demand the best in patient care.
Ask your laboratory about CytoScan® Dx Assay today.
**Unrivaled performance**

**CytoScan® Dx Assay**

### Benefits

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<tr>
<th>Description</th>
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<tr>
<td>First-of-its-kind diagnostic test</td>
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<td>FDA-cleared and CE-marked postnatal blood test to aid in the diagnosis of</td>
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<td>• Developmental delay</td>
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<td>• Intellectual disabilities</td>
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<td>• Congenital anomalies</td>
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<td>• Dysmorphic features</td>
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<td>Analyze the patient’s entire genome with one test</td>
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<td>Accurately detect numerous chromosomal variations of different types, sizes,</td>
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<td>and genomic locations at higher resolution than karyotyping and more</td>
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<td>comprehensively than conventional FISH.</td>
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<td>Exceptional performance</td>
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<td>Achieve high specificity, sensitivity, accuracy, and resolution across the</td>
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<td>genome.</td>
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<td>Designed for today and the future</td>
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<tr>
<td>The design of CytoScan Dx Assay, which includes 2.69 million CN markers</td>
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<td>across the entire genome, ensures all genes are represented, not only</td>
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<td>those identified as currently relevant.</td>
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<td>Dual-probe content with high-density SNPs</td>
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<td>Containing both CN and SNP probes, CytoScan Dx Assay elucidates allelic</td>
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<td>imbalances and identifies LOH which can be associated with uniparental</td>
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<td>disorders. SNP patterns also provide confirmation of copy number changes.</td>
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**Demand the best in patient care.**

Ask your laboratory about CytoScan® Dx Assay today.

To learn more visit [www.affymetrix.com/cma](http://www.affymetrix.com/cma)

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**WARNING:** This device is not intended to be used for standalone diagnostic purposes, pre-implantation or prenatal testing or screening, population screening, or for the detection of, or screening for, acquired or somatic genetic aberrations.

Interpretation of assay results is intended to be performed only by healthcare professionals, board certified in clinical cytogenetics or molecular genetics.

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