FINDING COLOR in a WORLD OF GRAY RESULTS
You hear them every day, questions that patients ask. What’s causing my symptoms? Why did this happen to me? What are the chances that I can pass this onto my children? The answers aren’t always clear. When it comes to a genetic diagnosis, you want the most reliable, up-to-date, understandable information.

We understand your challenge. We understand your quest for insight. When a variant of unknown significance is found we know that the interpretation is not always straightforward. That’s why we’ve developed Athena Insight™, a process for determining the significance of genetic variants.

“**Athena Insight provides a reliable, high quality, validated process for analyzing genetic variants of unknown significance. The standardized pathogenicity score is rigorously tested by state-of-the-art tools and assures the correct diagnostic interpretation of genetic testing results. Athena Insight is an invaluable service to clinicians and their patients.**”

Joseph J. Higgins
M.D., F.A.A.N.
Medical Director Neurology
At Athena Diagnostics, our approach to each genetic test is driven by a standardized analytical process implemented by our staff of experts in genetic variant sciences. Athena Insight is our core commitment to every evaluation we perform. At Athena Insight, our core commitment is to help identify and classify variants, so that clinicians can better understand each patient’s genetic disposition and manage the prognosis and treatment accordingly.

We understand your goals, and we work with you. Our high-touch approach optimizes the value of modern science and human insight. We look for color in a world of gray results.

The Athena Insight team:

- Combs through countless independent types of evidence and draws upon a comprehensive database of Variants of Unknown Significance (VUS).
- Creates consistency and objectivity in variant analysis, using structured variant pathogenicity scoring.
- Incorporates a standardized, evidence-based pathogenicity assessment/scoring process that stratifies variants into seven categories based on the relative likelihood of pathogenicity.
- Evaluates frequency in the general population, co-occurrence with pathogenic mutations, functional studies, clinical presentation and segregation of symptoms with disease in families. Information is collected from internal data, public databases and peer-reviewed literature.
- Suggests testing for other family members to enhance interpretations of variants of unknown significance.
Next Generation Sequencing (NGS) has transformed the way scientists extract genetic data from biological systems, revealing information about the genome, transcriptome, and epigenome of any species. Advances in throughput, scalability, speed, and resolution now enable rapid sequencing of large stretches of DNA base pairs spanning entire genomes, capable of producing hundreds of gigabases of data in a single sequencing run.

A superabundance of genetic information changes the diagnostic paradigm for clinicians and has the potential to greatly improve lives. With terabytes of information now available, variant analysis becomes critical in the search for a diagnosis.

The Athena Insight program is based on a standardized, quantitative pathogenicity scoring system to aid our board-certified geneticists and laboratory directors in the interpretation of complex data. Results that at one time were gray can now appear in color.
At Athena Diagnostics, science is our passion. Finding the cause of your patients’ genetic disease is our focus. We harness the power of science and seamlessly integrate it with our innovative VUS investigative process to help improve the lives of your patients.

From the start, even before the patient sample enters our laboratory for analysis, our commitment to delivering state-of-the-art testing is apparent—our NGS profiles are arranged by clinically relevant groups of phenotypes—allowing physicians to choose tests based on their patient’s clinical characteristics. This approach is especially useful in diagnosing cases with overlapping symptoms and non-specific clinical findings.

Inside our newly-built 45,000 SF neurodiagnostic center of excellence, you’ll find the world’s most powerful instrumentation and board-certified geneticists, dedicated to variant analysis. Our Next Generation Sequencing (NGS) and bioinformatics processes were developed, honed and validated to ensure the highest quality and reliability for the genetic results you depend upon every day—looking deeper into causative genes than ever before.

Not all Next Generation Sequencing is created equal. As a leader in genetic testing for neurology, endocrinology and nephrology, we have invested the time and resources to develop NGS and variant interpretation processes that provide expert interpretation of genetic results.
Our NGS testing platform features:

• **Concordance with Sanger sequencing.**
  Our extensive database is used to verify optimal sensitivity and specificity.

• **High average and depth of coverage.**
  Regions that would otherwise exhibit low coverage are supplemented by an additional proprietary bait library developed exclusively by Athena Diagnostics scientists and geneticists. The library offers enhanced specificity.

• **Hybridization-based enrichment.**
  This technology allows removal of duplicate fragments, reducing amplification bias, providing excellent allele balance, more confident variant calls, and better sensitivity.

• **A specialized “finishing library” as part of the sequencing/analytical process.**
  Detecting the widest range of structural variant types, our finishing library plays a critical role in identifying complex rearrangements, generating a higher quality assembly.

• **High-touch approach to VUS.**
  Our Athena Insight Variant Science Group and board-certified geneticists integrate and weigh the value of information from scientific and medical literature, our own extensive database and bioinformatics experience, *in silico* predictive algorithms, and other scientific sources.

• **A growing database.**
  Over 14,000 assessments on nearly 11,000 variants.
We pour over the data and research, discussing possibilities and probabilities, and apply a standardized pathogenicity score based on accumulated evidence and history.

Each variant identified is plotted within a 7-category ranking system that assesses its relative likelihood of pathogenicity. Over 14,000 pathogenicity assessments on 11,000 unique variants have been successfully performed to-date. By applying a structured assessment process to each evaluation, we optimize objectivity and build consensus among investigators.

The result report is clear and concise, with a pathogenicity assessment and complete sourced synopsis that clinicians can review with patients. Where there is ambiguity, our team of genetic counselors and board-certified geneticists are available to further interpret and confirm the findings.

Carol A. Hoffman, Ph.D., M.S., LGC
Genetic Counselor

Khalida Liaquat, M.S., CGC
Genetic Counselor
Athena Insight Result Report

A complete and concise synopsis of research data and findings, presented in clinical terms.

Interpretation and Results

A clear and concise interpretation field qualifies the Variant of Unknown Significance (VUS) and provides the information at a glance.

The Detail You Need

A comprehensive, variant specific table built from both internal and external data.

Exclusive Comments

A highly-customized comment section details the most significant results, complete with a visual scale indicating the likelihood that the VUS is benign or pathogenic.
At Athena Diagnostics, we see the big picture. We know that at the end of the day, our work goes beyond state-of-the-art equipment, methods and protocol. Athena Insight is the story of people helping people.

Our passion inspires us to optimize every step of the diagnostics process and to search tirelessly until every source is explored and a full spectrum of data is synthesized. Every day, we make new discoveries that change the lives of patients.

Our collaborative, high-touch process is built on a platform of comprehensive searches, curation and critical thinking by our team of scientists, board-certified geneticists and laboratory directors. This is our commitment.
As an integrated team, our scientists and geneticists are some of the industry’s top-tier thought leaders, clinicians and scholars. Many have lectured around the world, sharing their observations and discoveries on variant investigation and interpretation with colleagues in government and industry.

From personal consultation with one of our geneticists to literature curation that is up-to-date, our team can help you help your patients with a powerful combination of today’s technology and human insight.

Beyond the science and numbers, there is nothing more important than people helping to improve the lives of others. With the commitment of the Athena Insight team behind you, you can see more and do more for your patients. We help you understand your patient’s genetic testing result to assist in your formulation of a treatment plan. Our people help find color in a world of gray results.
To learn more about Athena Insight, visit www.AthenaDiagnostics.com/AthenaInsight.