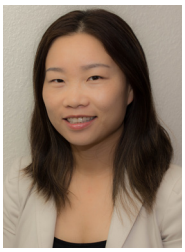
A Customer Success Story with the SureSelect Cancer All-In-One Lung and Custom Assays

Many types of cancers are caused by either inherited or de novo genomic abnormalities such as single-nucleotide variants (SNVs), copy number variations (CNVs), and/or chromosomal translocations. Reliably detecting these abnormalities requires an approach that is sensitive, specific, and flexible—which is why we developed the Agilent SureSelect Cancer All-In-One (AIO) assays for researchers that use next-generation sequencing (NGS) methods in their work.

One such researcher is Dr. Antonio Marchetti, Professor of Anatomic Pathology at the University of Chieti and Professor at the Pathology Unit – Hospital SS Annunziata (Chieti, Italy). His research lab is currently using the SureSelect Cancer All-In-One panel as well as custom SureSelect assays. Here, Dr. Tracy Liu, Ph.D. (Product Manager, Agilent Technologies) interviewed Dr. Marchetti about his work and how the SureSelect technology is helping him achieve his research goals in the laboratory.

Dr. Antonio Marchetti
Professor of Anatomic Pathology at the University of Chieti and Professor at the Pathology Unit, Hospital SS Annunziata, Chieti, Italy



Tracy Liu, Ph.D.
Global Product Manager - NGS, Diagnostics and Genomics Group, Agilent Technologies

---

Tracy Liu: "How are you using the SureSelect Cancer All-In-One Lung and custom assay in your laboratory?"

Antonio Marchetti: "We use the SureSelect Cancer All-In-One Lung and custom assay as part of the genomics test for the characterization of lung cancer in our pathology department. We still use real-time PCR assays when we need to test isolated cases, because we need an immediate test for routine biomarkers, such as EGFR or ALK1. But in all the other cases, when we are not in hurry and when we can process several cases together that come from different sites, I recommend the use of NGS-based genomic panels."

"Among the NGS tests available, I think that the SureSelect Cancer All-In-One Lung and custom assay are some of the most affordable, efficient, and accurate tests for the detection of different types of genomic alterations that are present in lung cancer cases, including SNVs, CNVs, and fusions: all the alterations that we need to detect."

Tracy Liu: "Dr. Marchetti, I know your lab is one of the first labs in Italy to use NGS in pathology. What were some of the key challenges when first applying NGS in the pathology laboratory? And how does the SureSelect Cancer All-In-One assay and the Agilent NGS workflow address those key challenges?"

Antonio Marchetti: "The main challenges in applying NGS in the pathology lab are mainly related to the costs, the execution time, and the accuracy of the test. An ideal test should be sensitive, specific, rapid, and easy to perform as well as cost-effective. The conventional real-time PCR based methods for the detection of single genomic markers are usually sensitive and specific. However, in terms of cost and time of analysis, they are not competitive nowadays as we need to simultaneously test several markers for the accurate characterization of a specific tumor type.

Agilent
Trusted Answers

An NGS All-In-One assay, like the SureSelect Cancer All-In-One assay ensures high-quality results for all of the markers we need to investigate today at a convenient cost—less than the one obtainable by testing two or three different markers that are independently examined. So, it's a quite interesting type of test for the pathologist today."

Tracy Liu: "You are currently using the SureSelect AIO panels on both tissue and plasma samples. What are the important factors for an assay to be suitable for both sample types?"

Antonio Marchetti: "An assay can be good on both tissue and plasma, but I believe that actually this is not easy at all. To be good on plasma, the test should be extremely sensitive, but also highly specific. An extremely sensitive test is good on plasma, but it may be difficult to handle on tissue due to the presence of low-prevalence mutations that could be real or artifacts that are quite frequent in formalin-fixed samples. The sensitivity of an assay needs to rely on software by using different bioinformatic pipelines and cut-offs for plasma and tissue samples. In my opinion, considering our experience on both tissue and plasma, the SureSelect Cancer All-In-One Lung and custom assay is one of the most interesting products in the market. By combining a good chemistry based upon the hybridization and capture approach with specific pipelines for tissue and plasma, it can assure good sensitivity and specificity on both substrates: tissue and plasma. In addition to this, through [the Agilent] Magnis system and its automated approach, it is possible to handle the test on plasma and tissue samples together, making the system particularly useful in daily use. I think that nowadays the pathologist needs such a flexible platform."

Tracy Liu: "How should a molecular pathology laboratory cope with the changing needs in cancer NGS testing?"

Antonio Marchetti: "I think that's an important question. The cancer biomarker landscape is evolving rapidly. An increasing number of targetable mutation or resistance-induced mutations are introduced every year for specific targets in new treatment. So an NGS assay must be flexible, allowing the introduction of new markers without compromising the integrity of the laboratory systems. The SureSelect Cancer All-In-One Lung and custom assay, based on the hybridization and capture strategy, is an ideal companion for the pathologist who has to deal with these changes in cancer NGS testing."

www.agilent.com

Published in the USA, March 1, 2021
5994-3099EN

"The tests are becoming more and more complex as we need to increase the number of tests for different biomarkers and a flexible test like the SureSelect Cancer All-In-One Lung and custom assay can be of particular help to the pathologist in this milieu."

Tracy Liu: "Where do you see the application of NGS in molecular pathology and precision oncology going in the next few years?"

Antonio Marchetti: "I think, in the next few years, that NGS will become the technology of choice in the characterization and genomic status of tumors in order to treat them. I think that large genomic panels that allow the detection of not only all types of gene mutations in all (or almost all) cancer-related genes, but also microsatellite, genomic instability, and tumor mutations involved, would become the most common type of test. So, the way to go is through a large panel."

"The main limitation to the use of large genomic panels at the moment, I think, is probably the cost of high-processing NGS platforms required for this test and the cost of reagents. But I am quite confident that, with the diffusion of the technology, the cost will further decrease. So, in conclusion, I think that large genomic panels represent the future of the genomic test in oncology in the next few years."

Tracy Liu: "What is your advice for the other pathology labs who see the need to bring NGS into the laboratory, but still see NGS as a challenging and high-cost technology?"

Antonio Marchetti: "Before introducing the NGS system in the lab, the pathologist should know the number of cases they have to detect in a year very well since NGS requires a large number of cases in order to be competitive in cost and time for the detection."

"I think that NGS can't be spread all over the world in pathology departments, at least for now. Maybe in the future the situation could be different but, at least for now, I think that a limited or precise number of the referral centers with a large number of cases to be investigated in the year—possibly coming from different satellite centers—is required in order to start this type of activity. I think that NGS can't be as diffused as real-time PCR in the pathology department at this moment, but it will become a quite common technology in the future."

Tracy Liu: "Thank you so much, Dr. Marchetti for sharing your insights and thoughts. We really appreciate it!"

Agilent
Trusted Answers