How AI Is Transforming Biomarker Development in GI Oncology

Announcer:

You're listening to *Project Oncology* on ReachMD. On this episode, Dr. William Hall will discuss artificial intelligence in pathology and genomic biomarker development, which he spoke about at the 2026 ASCO Gastrointestinal Cancers Symposium. Dr. Hall is a Professor and Chair of Radiation Oncology at the Medical College of Wisconsin. Let's hear from him now.

Dr. Hall:

There's a number of ways that AI is being used in the present day in gastrointestinal cancers. One of the things I think is important to highlight in the space of AI is it changes really quickly. So it seems almost year to year, or even in some cases, month to month, there are new and really exciting tools that are being applied to different standard techniques that we use in gastrointestinal oncology to accelerate and enhance what we're able to do.

Some of the most common things that have been used for a long time are AI tools being used to enhance the capabilities of standard medical practice of humans. So that would mean things like detection of malignancy or highlighting regions that need to be given further attention by a gastrointestinal pathologist, or accelerating the analysis and interpretation of standard pathologic processes. Things like detecting certain tumor mutations or detecting features of a tumor that would make it particularly susceptible to one type of treatment or another. So those are some of the most fundamental and basic ways that AI is currently being used.

The way that AI biomarker development differs from more traditional biomarker development strategies is really multifaceted. Historically we've used biomarkers in oncology for many decades with the goal of identifying features of a tumor or patient characteristics, or combinations of patient characteristics and tumor characteristics, that are associated with a particularly either aggressive oncologic phenotype or less aggressive oncologic phenotype. So we use those really routinely in a number of cancers to identify the features and characteristics of this patient's individual tumor that are directing us toward a particular intervention or recommended oncologic therapeutic strategy for that patient.

The way that those have historically been developed has been very slow. It's a really basic way of just collecting data from large data sets and correlating various characteristics to clinical outcomes. And that's typically been done manually, where oftentimes, researchers will manually extract that data and then catalog it in a database of some sort, and then they'll correlate those various characteristics to a particular event of interest.

But what's exciting is AI is really changing quite a bit of that. The first thing I like to always do when we talk about this with colleagues is just set some standards. What do we mean when we say AI? True AI in this case would include learning and reasoning and problem solving and perception. Those are key characteristics of AI biomarker development that are very new. People are very familiar with Excel, and most people are very familiar with tools like Siri on an iPhone. Excel would be historically the way that we've approached biomarker development, where you catalog things and you can take hundreds of thousands or tens of thousands of data points, and you can summarize them really elegantly. But those tools, at least historically, did not really learn from the data themselves. They weren't learning and reasoning and solving problems independently.

I think what we're going to see in the coming years, and what we're certainly beginning to see now, is that tools can be trained to actually learn independently from very high dimensional data sets. And the role that we are going to play in training and developing these biomarkers is providing the dataset and then also providing the hope of the biomarker outcome. So we really need to provide the input and the output. And then many of the tools that are developing these biomarkers are learning reasoning and problem solving, and understanding features that in some cases we understand, and in some cases we don't. But it's totally changing the way that

biomarkers are being developed broadly.

The first and the overarching challenge that I think is quite present is just basic understanding. What is AI, and how can it be helpful? And I think there's an intimidation factor when people hear AI. They look at it as a black box, and it largely is a black box in many different circumstances.

The second challenge that I think is really important that we're definitely facing is data security and making sure that all the work that's being done is being done in compliance with all of the patient protection and privacy laws and regulations that exist. That is not a small feat.

And then the third that comes to mind is making sure that the input and the output are incredibly high quality. The reason I present this as the third challenge is that we really have to focus on, what is that data that's being used to generate a biomarker? And is it curated well? Is it formatted and presented in a manner that we think is reliable?

Announcer:
That was Dr. William Hall discussing artificial intelligence in pathology and genomic biomarker development. To access this and other episodes in our series, visit *Project Oncology* on ReachMD.com, where you can Be Part of the Knowledge. Thanks for listening!