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nature medicine

Genomic and transcriptomic profiling expands precision cancer medicine: the WINTHER trial

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This clinical trial revealed that combining RNA and DNA profiling gives a far more precise indication of the active biological elements within a tumor, enabling clinicians to more accurately determine which targeted therapies could improve survival among patients with advanced cancer. It marks the first clinical trial in cancer to add gene expression on top of DNA aberration. The Segal Cancer Centre at the Jewish General Hospital was the only Canadian site in this pioneering international effort undertaken by the Worldwide Innovative Networking in Personalized Cancer Medicine (WIN Consortium).

The 107 patients who received treatment had late stage disease for which there was little hope of improvement. All had already received extensive treatments, with one-quarter having received at least five prior lines of therapy. Nonetheless, more than 26% of the participants experienced at least six months of partial or complete response to the new therapies introduced as a result of the combination RNA and DNA profiling. More than 22% experienced survival that surpassed the previously expected norm.

The premise behind the WINTHER study was to consider therapy options based on the observed characteristics of an individual's tumor, rather than aggregating based on larger group studies. It has been determined that analysis of the genetic mutations in a tumor doesn't necessarily isolate the active elements that represent the best clinical targets. This trial showed that profiling RNA gives a more accurate picture of the molecules that drive tumor progression in an individual case and, where those molecules can be targeted, much better results are achieved. Because DNA and RNA are not directly aligned in cancer cells, this added dimension of profiling is very important to personalizing treatment.