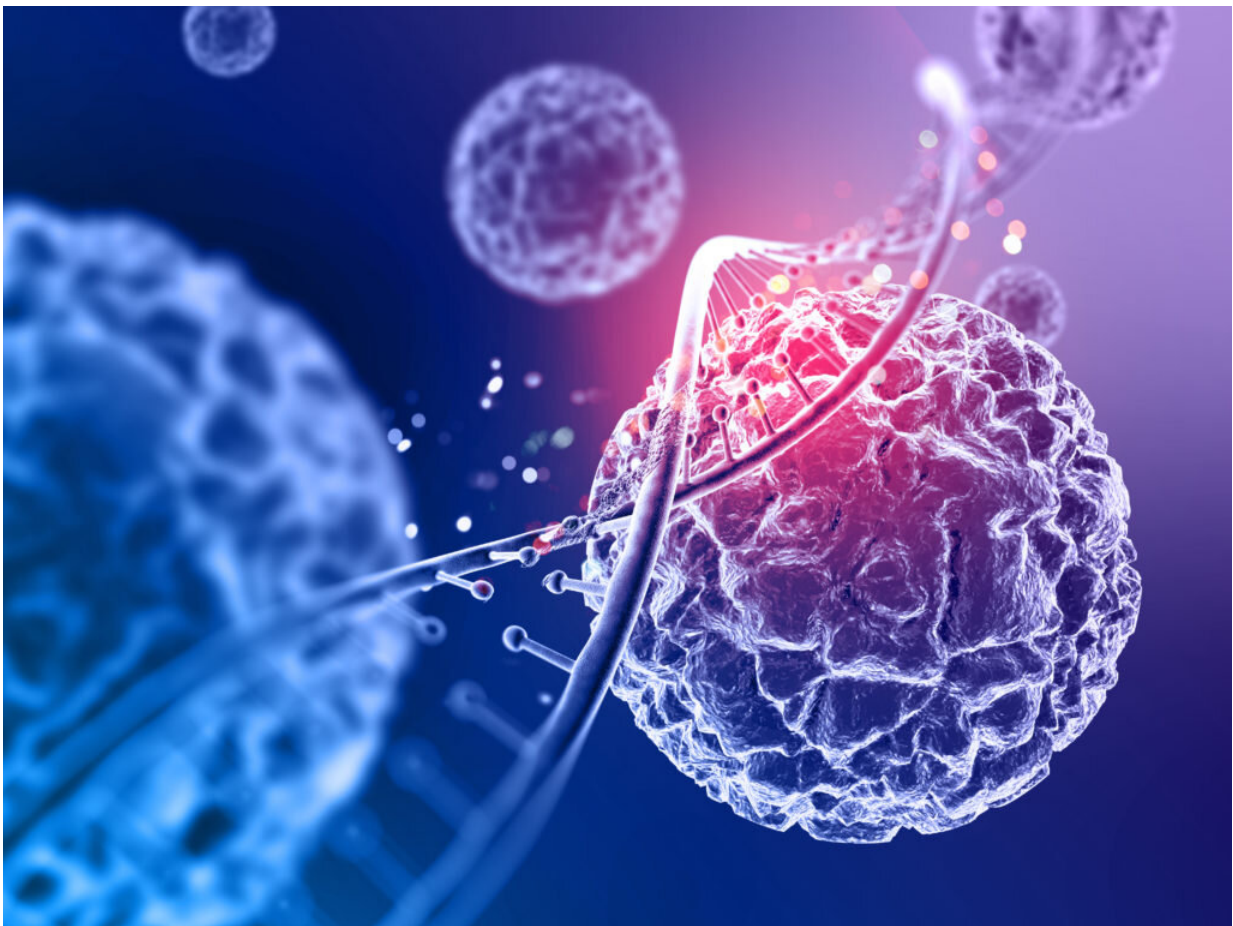


The number and clonality of TCRs are associated with the prognosis of colorectal cancer

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Credit: IDIBELL-Bellvitge Biomedical Research Institute

Colorectal cancer (CRC) is the third most common cancer in the world, with more than one and a half million new cases diagnosed annually. Approximately 20% of diagnosed stage II patients experience relapses after surgery. There is no marker yet that identifies stage II patients at risk of relapse. Therefore, it is important to be able to identify prognostic biomarkers for this specific setting.

To date, it was already known that the infiltration of T cells (a type of lymphocyte that is part of the adaptive immune system) plays an important role in the survival of patients with [colorectal cancer](#). Thus, using a new technique called "TCR immuno-sequencing," in samples from more than 600 patients with colorectal cancer, they have verified the usefulness of this new biomarker. This new technique measures both the amount of infiltrated T lymphocytes and their clonality, which is the diversity of lymphocytes that recognize different targets.

This study is a collaboration led by Víctor Moreno, head of the Oncology Data Analysis Program (PADO) of the Catalan Institute of Oncology (ICO), the Bellvitge Biomedical Research Institute (IDIBELL), CIBERESP, and the University of Barcelona, and his team. The research group led by Dr. Steven Gruber, from the City of Hope National Medical Center in Los Angeles, USA, Dr. Harlan Robins, CEO of the Adaptive Biotechnologies company, spin-off of the Cold Hutch Cancer Research Center, Seattle, USA, and Prof. Gad Rennert, Carmel Medical Center and Technion, Haifa, Israel.

How has this study been carried out?

Using this new TCR immuno-sequencing technique, a total of 640 colorectal [cancer](#) tumors have been sequenced from four different studies, three from patients from ICO Hospitalet and one from Israel. Thus, unlike the other methods, by sequencing the TCR regions (receptor for lymphocytes that recognize tumor antigens), both, the

abundance of the T cell that infiltrates to the tumor and the clonality index, were obtained.

The results obtained have shown that the combination of both variables, quantity and clonality, is associated with the prognosis. The samples with the highest amount of TCR and diversity of clones are those that show a better prognosis of the disease. According to the head of the Oncology Data Analysis Program (PADO) of the ICO-IDIBELL, Víctor Moreno, "the results of this study show that higher levels of TCR, and a greater diversity of TCR receptor, is associated with a better prognosis in this specific group of patients where there are still no clear markers of recurrence."

More information: Rebeca Sanz-Pamplona et al, Lymphocytic infiltration in stage II microsatellite stable colorectal tumors: A retrospective prognosis biomarker analysis, *PLOS Medicine* (2020). [DOI: 10.1371/journal.pmed.1003292](https://doi.org/10.1371/journal.pmed.1003292)

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