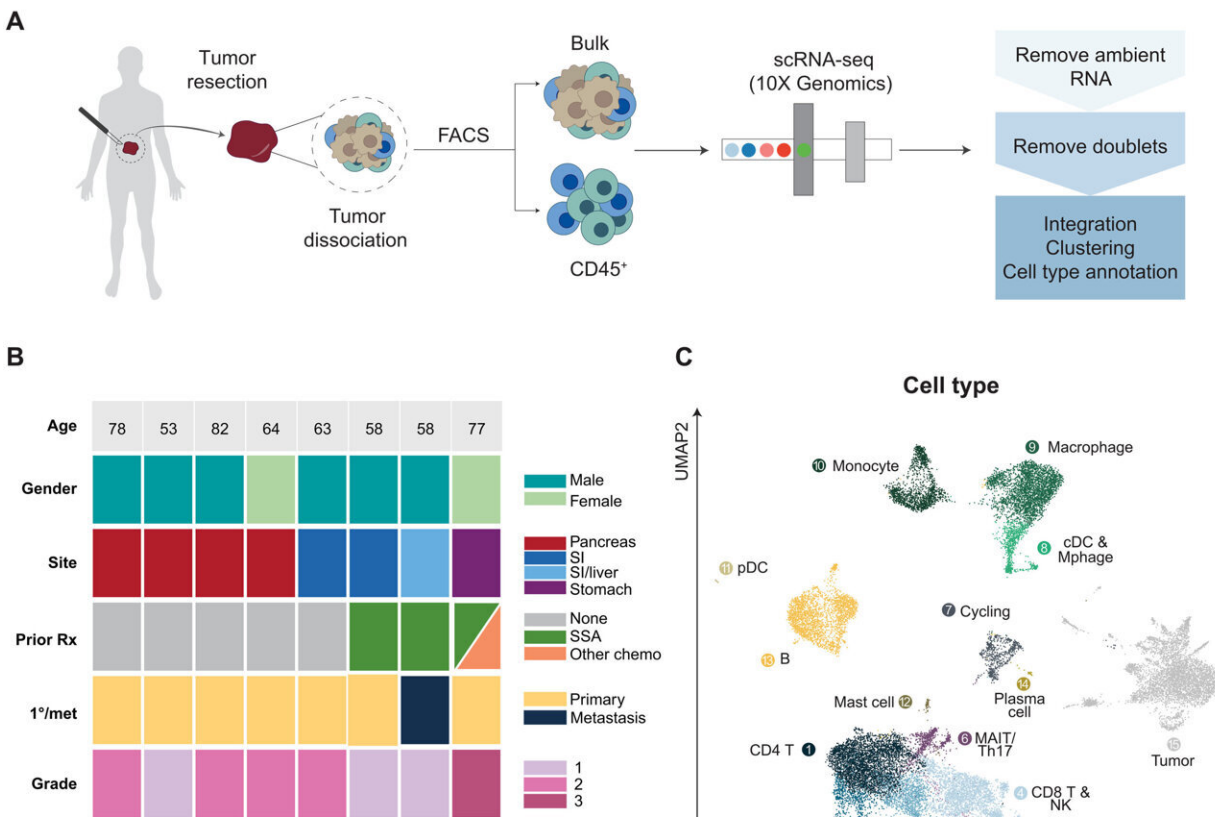


Study provides new look at why rare cancer often evades treatments

September 28 2023



Characterizing the cellular landscape of pancreatic, small intestinal, and gNETs. (A) NET scRNA-seq workflow. Resected tumor fragments were dissociated into single-cell suspensions, which were then divided for parallel sequencing of (i) nonsorted single cells and (ii) fluorescence-activated cell sorting (FACS) sorted, CD45⁺ immune cells. All samples were processed using the 10x Genomics platform. (B) Patient demographics and treatment summary at time of tumor resection. Site: SI, small intestine; SI/liver: small intestinal primary tumor with liver metastasis. A bar underneath samples indicates that they originate from the

same patient. (C) UMAP of malignant and nonmalignant cells from all tumors, colored by general cell type. (D) UMAP of malignant and nonmalignant cells from all tumors, colored by sample of origin (left). (E) Cellular composition of each tumor, colored by general cell type. Credit: *Science Advances* (2023). DOI: 10.1126/sciadv.add9668

Researchers at Boston Medical Center and Dana-Farber Cancer Institute have conducted one of the first-ever analyses of neuroendocrine tumors (NETs) at single-cell resolution, unlocking new insights into this rare and often hard-to-treat cancer. The findings represent a tremendous leap forward in understanding why these tumors are largely resistant to immunotherapy and provide key insights that could lead to future treatments.

The [full study](#) was published today in *Science Advances*.

"This study was a tour-de-force that catalyzed the efforts and innovations of researchers across Boston—including Boston Medical Center and Dana-Farber Cancer Institute—and has resulted in a better understanding of the molecular drivers of these heterogeneous, difficult-to-treat tumors," said co-author Matthew Kulke, MD, chief of hematology/oncology at Boston Medical Center, Co-Director of the BU/BMC Cancer Center, and the Zoltan Kohn Professor at Boston University Chobanian & Avedisian School of Medicine. "The findings represent a potential first step towards opening up new potential treatments for patients who have [neuroendocrine tumors](#)."

Neuroendocrine cells are found in organs throughout the [human body](#) and send messages through hormones that help the body function. In adults, NETs often originate in the [gastrointestinal tract](#), pancreas, and lung. Despite new forms of treatment, the tumors remain difficult to

treat and are largely resistant to immunotherapy, which has revolutionized treatments for other cancers. In part, the reason for this challenge is that the understanding of the underlying biology of NETs was incomplete.

"This study provides remarkable insights about the heterogeneity of neuroendocrine tumors and the tumor and immune microenvironment," said Jennifer Chan, MD, MPH, Clinical Director, Gastrointestinal Cancer Center, Dana-Farber Cancer Institute. "We are currently building on this work with the aim to discover new therapeutic strategies that will advance the care of patients with neuroendocrine tumors."

Through this study, researchers sought to understand both the tumors themselves and the surrounding cells in the tumor microenvironment. Leveraging [single cell](#) sequencing allowed for an unprecedented view of the genes and signaling pathways that are involved in tumor progression and potential response to immunotherapy.

The team uncovered previously unappreciated heterogeneity within neuroendocrine tumor subtypes and revealed potential evolution in tumor characteristics as they metastasize. At that resolution, they were also able to observe cells and related proteins in that microenvironment that suppress immune responses. Targeting those proteins could render these tumors more responsive to immunotherapy treatment.

More information: Samantha E. Hoffman et al, Intertumoral lineage diversity and immunosuppressive transcriptional programs in well-differentiated gastroenteropancreatic neuroendocrine tumors, *Science Advances* (2023). [DOI: 10.1126/sciadv.add9668](https://doi.org/10.1126/sciadv.add9668)

Provided by Boston Medical Center

Citation: Study provides new look at why rare cancer often evades treatments (2023, September 28) retrieved 11 July 2024 from

<https://medicalxpress.com/news/2023-09-rare-cancer-evades-treatments.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.