

Colorectal cancer (CRC) is one of the most common types of cancer diagnosed globally. Still, current methods for diagnosing and prognosis of this disease often involve invasive procedures that can be challenging for patients. These traditional tests, like tissue biopsies, might not always provide a complete picture of the cancer due to its complex nature. That is where this new research project aims to significantly impact how we understand and treat colorectal cancer. The study focuses on a cutting-edge technique known as "liquid biopsy." Unlike traditional biopsies that require surgical tissue removal, liquid biopsies involve collecting and analyzing circulating tumor cells (CTCs) from a blood sample. These cells break away from the original tumor and travel through the bloodstream. By studying these cells, doctors can get valuable insights into the characteristics of the cancer without the need for invasive procedures.

This research uses a sophisticated technology called Rosettesep to capture various CTCs, regardless of their specific markers. This allows the researchers to gather a broad spectrum of CTCs and categorize them into different types based on whether they show traits of epithelial cells (cells that line the inside and outside surfaces of the body), mesenchymal cells (cells that are part of the connective tissue), or both—a state known as epithelial-mesenchymal transition (EMT). Understanding these types is crucial because they each behave differently and can give clues about how aggressive the cancer is and how likely it is to spread.

One innovative aspect of this study is comparing CTCs from two sources: the peripheral blood (commonly drawn from the arm) and the portal vein blood (which drains from the digestive organs and goes directly through the liver). The comparison is critical because the liver acts like a filter and might trap certain types of cancer cells before they can spread further, potentially offering early signals of metastasis—the spread of cancer from one part of the body to another. By analyzing these cells, the research aims to identify specific patterns and counts of CTCs that could indicate a more severe form of cancer and poorer prognosis for the patient. This could lead to the development of a threshold count of CTCs that, when exceeded, signals a high risk of aggressive cancer. This threshold could help doctors make more informed decisions about treatment, potentially customizing it based on the patient's unique cancer profile.

In simpler terms, this study hopes to provide doctors with a new tool that could tell them not only how to treat colorectal cancer more effectively but also how to spot signs of serious trouble earlier than ever. This could mean more personalized, timely patient treatment, improving their chances of a better outcome. This research holds the promise of transforming how we manage colorectal cancer, turning routine blood draw into a powerful diagnostic tool.