Blood test for cancer may lead to improved strategies for treatment

In 2012, Charles Swanton was forced to confront one of cancer's dirtiest tricks. When he and his team at the Cancer Research UK London Research Institute sequenced DNA from a handful of kidney tumours, they expected to find a lot of different mutations, but the breadth of genetic diversity within even a single tumour shocked them. Cells from one end differed from those at the other and only one-third of the mutations were shared throughout the whole mass. Secondary tumours that had spread and taken root elsewhere in the patients' bodies were different again.

The results confirmed that the standard prognostic procedure for cancer, the tissue biopsy, is woefully inadequate — like trying to gauge a nation's behaviour by surveying a single street. A biopsy could miss mutations just centimetres away that might radically change a person's chances for survival. And although biopsies can provide data about specific mutations that might make a tumour vulnerable to targeted therapies, that information is static and bound to become inaccurate as the cancer evolves.

But researchers have found ways to get a richer view of a patient's cancer, and even track it over time. When cancer cells rupture and die, they release their contents, including circulating tumour DNA (ctDNA): genome fragments that float freely through the bloodstream. Debris from normal cells is normally mopped up and destroyed by 'cleaning cells' such as macrophages, but tumours are so large and their cells multiply so quickly that the cleaners cannot cope completely.

Read the full, original story: Cancer biomarkers: Written in blood