

The use of circulating melanoma cells for clinical disease monitoring

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There is increasing evidence that the presence of circulating tumour cells (CTCs) in patient blood is an important indicator of the potential for metastatic disease and poor prognosis. Thus, quantification of CTCs and characterisation of CTCs into heterogeneous subtypes including melanoma stem cells may advance prognosis. To detect and characterise melanoma CTCs we stained whole blood samples for flow cytometric analysis. We also isolated CTCs using a cocktail of immunomagnetic beads labelled with melanoma and stem cell markers. Viable CD45 negative, CD34 negative cells, positive for the melanoma markers MCAM and MCSP, stem cell markers CD271 and ABCB5 or metastatic-cell marker RANK were quantified as CTCs. An average recovery of 85% was obtained when a melanoma cell line (A2058) was spiked into whole blood from healthy volunteers.

The number and phenotype of CTCs in melanoma patients at different disease stages (I-IV) were evaluated relative to age-matched healthy volunteers. Isolated CTCs were also assessed for BRAF mutations. Our results indicate that the number of CTCs was significantly higher in patients at TNM stages III to IV, when compared to early stages (I and II) and controls. This difference was particularly apparent for CTCs positive for stem cell markers ABCB5, CD271 and RANK. CTCs were RNA-positive for melanocytic markers MITF-M and DCT. Moreover, CTCs from individuals with B-RAF^{V600E} tumours were found to carry this mutation. Altogether, our results support the use of CTCs at various stages of clinical disease and for monitoring of patients before and during treatment to assist in therapeutic decisions.

Biography

Mel Ziman completed her Ph.D. at the age of 27 years from the University of Cape Town. She completed postdoctoral studies at Cornell University, New York and the University of Western Australia, School of Medicine. She is the Director of the Edith Cowan University Melanoma Research Foundation. She has published more than 75 papers in international peer reviewed journals and serves as a Reviewer and Editor of reputable journals.

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