

Rapid In Vitro Screening Test of Tumour Cells Migratory Reactions to Potential Migrastatics

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Abstract:

Solid tumor metastases particularly the late ones cause the majority of cancer-related deaths. Prevention of their occurrence has been lacking suitable medication. The novel conception of migrastatics stems from the knowledge of the link between cancer cell metastatic potential in vivo and their enhanced migratory activity in vitro and looks for a workable solution based on inhibition of cancer cell migration as probed in vitro. Repurposing medicaments for exploitation of their side effects for migrastatic/migration inhibiting activity appeared to be the easiest way to the fast progress in the fight against metastases. This situation led us to think about a design of a suitable first sieve for catching the right migrastatic candidate. For registration of live cell activities, we used Q-Phase by Telight, Brno, the Czech Republic, which is a Coherence-Controlled Holographic Microscope with Holographic Incoherent Quantitative Phase Imaging. It provides a non-invasive method of monitoring cellular events, especially migration and growth with changes in cell morphology during a 20-hour, approximately the length of the cell cycle, time-lapse follow-up. This microscopical biotechnology enables the most reliable and accurate automatic cell segmentation and monitors growth, morphology, and positional changes over time. Then the automated image analysis of the whole cell population for speed of migration of the individual cells and evaluation of their migratory and growth behavior is crucial for the assessment of the overall impact of the examined putative migrastatics. On the other side, it is complemented by watching for a possible rare occurrence of an invasive cancer cell phenotype induced by the stress elicited incidentally by the tested medicament.

References:

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