ADJUSTMENT OF A CELLULAR BASED METHODOLOGY TO PREDICT RESPONSE TO MELPHALAN- OXALIPLATIN IN BREAST AND COLON CANCER

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Background: Melphalan is a widely used chemotherapy drug, which belongs to the family of "nitrogen mustards alkylating agents". Oxaliplatin, is also a platinum-based chemotherapy drug, which is among the alkylating agents, because it has a similar mechanism of action, however, is not actually in alkylating group. The literature and experimental data have pointed out the emergence of resistance to the above drugs. The purpose of the present study is to determine the predictive value of cellular methodologies, which will provide the response to the above drugs.

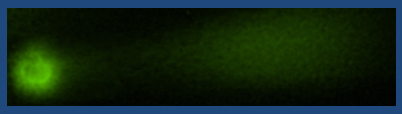

Figure 1: Cell from MDA-MB 231 cell line (control)

Figure 2: Cell from MDA-MB 231 cell line (treated with melphalan)

Comet Assay	Control		Melphalan	
	% DNA in Head (Min-Max)	% DNA in Tail (Min-Max)	% DNA in Head (Min-Max)	% DNA in Tail (Min-Max)
MCF-7	**62,751-70,109**	**29,881-37,239**	**81,538-86,382**	**14,359-19,061**
MDA-MB 231	**74,158-80,122**	**19,868-25,832**	**80,329-84,991**	**14,999-19,661**
T47D	**75,262-80,478**	**19,512-24,728**	**83,435-87,305**	**12,685-16,555**

Table. 2: Comet Assay results in Breast cancer cell lines

Comet Assay	Control		Oxaliplatin	
	% DNA in Head (Min-Max)	% DNA in Tail (Min-Max)	% DNA in Head (Min-Max)	% DNA in Tail (Min-Max)
HCT-15	**81,002-86,830**	**13,488-19,260**	**93,336-96,162**	**4,099-6,953**
HCT-116	**58,779-67,421**	**32,579-41,221**	**82,883-86,937**	**13,053-17,107**
HT55	**66,856-72,484**	**27,513-33,141**	**74,701-80,251**	**19,748-25,298**

Table. 1: Comet Assay results in Colon cancer cell lines

Materials & Methods: Established human cancer cell lines (provided by HPA-ECACC), that represent breast and colon cancer, have been used for the realization of this study. In order to detect the effect or not of the above chemotherapy drugs, single cell gel electrophoresis (COMET Assay) has been used.

Results: The COMET-assay results pointed out a significant effect to both compounds with statistical evaluation in both types of tumors.

Conclusion: By using this cellular based method (COMET Assay), it is possible to predict the response of individual patients to each drug, which have the same mechanism of action. It is a methodology that provides quick, reliable results, with minimum requirements. However, such studies are necessary to be made to a greater range of tumors in order to be refined.

Selected References:

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