

ADJUSTMENT OF A CELLULAR BASED METHODOLOGY TO PREDICT RESPONSE OF DOXORUBICIN IN BREAST CANCER

Anwendung einer zellulären Methodologie zur Prognose der Wirkung des Zytostatika Doxorubicin bei Brustkrebs

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Introduction: Doxorubicin (Adriamycin) is an anthracycline antibiotic and is widely used as a chemotherapy drug against hematological malignancies and many other types of carcinomas. Doxorubicin interacts with DNA by intercalation, thus inhibiting the enzyme topoisomerase II, which relaxes supercoils in DNA for transcription. Literature and experimental data have pointed out the resistance mechanisms developed by the cancer cells or natively existed. The purpose of the present study is to evaluate a cellular-based methodology (COMET assay), that predicts response to chemotherapy with Doxorubicin, in breast cancer cell lines.

Selected References:

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Materials & Methods: MCF-7, MDA-MB 231 and T47D established human cancer cell lines (provided by HPA-ECACC), that represent breast cancer, have been used in this study. Single cell gel electrophoresis or COMET assay, is the cellular-based method which has been used in order to detect the effect or not of Doxorubicin.

Results: The COMET assay results pointed out significant effect of Doxorubicin with statistical evaluation in all cell lines.

Comet Assay	Control		Doxorubicin	
	% 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	78,653-84,007	16,548-21,732
MDA-MB 231	74,158-80,122	19,868-25,832	81,982-85,878	14,112-18,008
T47D	75,262-80,478	19,512-24,728	80,898-85,442	14,548-19,092

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

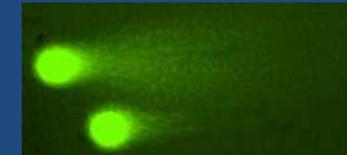


Figure 1: Cells from MDA-MB 231 cell line (control)



Figure 2: Cells from MDA-MB 231 cell line (treated with doxorubicin)

Conclusion: COMET assay is a method which is able to predict the response of individual patients to Doxorubicin and each other drug with the same mechanism of action. It is a technique that enables fast and reliable results with the minimal requirements. Further studies to a greater range and scale of tumors need to be performed, before it may be applicable in clinical routine.

Disclosure of Potential Conflicts of Interest

None of the authors of the above study has declared any conflict of interest

