

Excision Repair Cross-Complementation group 1 – ERCC1 (MS-671)

The excision repair cross-complementing 1 (ERCC1) gene has a role in the effectiveness of cisplatin therapy, which is the cornerstone of therapy for non-small cell lung cancer.

It has been shown in various publications that ERCC1 expression influences ERCC1-mediated deoxyribonucleic acid (DNA) adduct repair activity, and agents that affect ERCC1 in tumors may result in increased or decreased sensitivity to cisplatin.

Clinical oncology has struggled for decades with the predicament of the toxicity of chemotherapy for the treatment of malignant disease. For example, cisplatin and its analogues, carboplatin and oxaliplatin, are commonly used anticancer agents, but they are particularly toxic. Moreover, some patients benefit substantially from treatment with these drugs, whereas others suffer the toxic effects of the drugs without obtaining real benefit. The use of molecular markers to help identify who may benefit and who may not is one of the most exciting new areas of study in oncology.

In this respect, it has also been demonstrated by various investigators that high ERCC1 messenger ribonucleic acid (mRNA) levels, measured by quantitative reverse transcriptase-polymerase chain reaction (RT-PCR) result in shorter survival for patients with ovarian, gastric, esophageal, and non-small cell lung cancer. In addition, ERCC1 also confers resistance to oxaliplatin, which is the new platinum analog effective in patients with advanced colorectal carcinoma, and high ERCC1 levels can predict oxaliplatin failure.

Recently, an Immunohistochemical study has been published on The New England Journal of Medicine

(N Engl J. Med 2006; 355:983-991):

“DNA repair by ERCC1 in Non-small cell lung cancer and cisplatin-based adjuvant chemotherapy”.

This study was designed as collaboration among twenty-eight centers in 14 countries.

The purpose of the study was to evaluate if the level of **expression of ERCC1 protein** in the tumors could be **a predictor of survival benefit from cisplatin-based adjuvant chemotherapy**.

The results suggest that **“the determination of ERCC1 expression in non-small cell lung cancer cells before chemotherapy can make a contribution as an independent predictor of the effect of adjuvant chemotherapy”.**

Moreover, it is also important in other type of cancer of the ovary, cervical, testicular, bladder and gastric.