

Biomarkers for risk assessment in colorectal cancer patients (Ramot)

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Mortalin (also known as GRP75 and mitochondrial stress protein 70) is a ubiquitously expressed mitochondrial chaperone related to the cytosolic heat shock protein 70 (HSP70). It protects cells from senescence and apoptosis and is overexpressed in most cancer cells. We discovered that cell resistance to complement-dependent cytotoxicity depends on mortalin and that mortalin is released from cells during complement attack (Pilzer and Fishelson, Int. Immunol. 2005; Pilzer et al. Int. J. Cancer 2010). We have investigated whether or not colorectal cancer patients have circulating mortalin in their blood. To this end, we developed a sensitive ELISA for mortalin.

We have tested (in Tel Aviv) the levels of mortalin in serum samples (collected in Budapest) from 2 large cohorts of CRC patients. The levels of soluble Hsp70 were also determined in these patients' sera by using a commercial Hsp70 ELISA. The significance of mortalin and Hsp70 in blood to survival prospects of the colorectal cancer patients was evaluated in two independent studies.

THE NEED

Colorectal cancer is the third most common cancer in men (746,000 cases, 10.0% of the total) and the second in women (614,000 cases, 9.2% of the total) worldwide. The American Cancer Society estimates that 136,830 people will be diagnosed in 2014 and that 50,310 will die from colon cancer in the United States. Mortality rates for colorectal cancer have declined in both men and women over the past two decades. These decreases reflect declining incidence rates and improvements in early detection and treatment.

A key challenge in the clinical management of newly diagnosed colorectal cancer patients is the choice of correct treatment. With the growing availability of treatment options and protocols, the correct determination of the patient's prognosis is key in selecting the proper adjuvant therapy following surgery. With the limited data available today, many patients are subjected to unnecessary aggressive and expensive treatments, while others are under treated, increasing their risk of poor survival.

The technology we have developed may provide critical information for assessing the urgency of treatment and for correctly selecting the medicine for each of these patients.

THE PRODUCT

An In-Vitro Diagnostic (IVD) kit that measures the levels of circulating mortalin and HSP70 biomarkers in blood samples, identifying colorectal cancer patients at high risk of poor survival as well as patients with high prospect for 5 years survival.

INTELLECTUAL PROPERTY

Patents EP2906954B1, WO/2014/057490 and US 20150268242A1.

SUPPORTING PUBLICATIONS

- Perri Rozenberg, Judit Kocsis, Moran Saar, Zoltan Prohaszka, George Fost and Zvi Fishelson: Elevated levels of mitochondrial mortalin and cytosolic HSP70 in blood as risk factors in colorectal cancer patients. Int. J. Cancer 133(2) 514-518 (2013)
- Ritta Jubran, Judit Kocsis, Nora Garam, Eva Malati, Timea Gombos, Lorand Barabas, Laszlo Graf, Zoltan Prohaszka and Zvi Fishelson: Circulating mitochondrial stress 70 protein/mortalin and

cytosolic Hsp70 in blood: Risk indicators in colorectal cancer Int. J. Cancer: 141, 2329-2335 (2017)

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