

Hsp60 levels in circulating exosomes inpatients affected by human large bowel cancer before and after ablative surgery

C. Campanella^{1,2*}, F. Rappa^{2,3*}, C. Sciumè^{4*}, A. Marino Gammazza^{1,2}, R. Barone^{1,2}, F. Bucchieri^{1,2}, S. David¹, G. Curcurù⁵, C. Caruso Bavisotto^{1,2}, A. Pitruzzella^{1,2}, G. Geraci⁴, G. Modica⁴, F. Farina¹, G. Zummo¹, S. Fais⁶, E. Conway de Macario⁷, A.JL Macario⁷, E. Cappello^{1,2}

¹Dept. of Experimental Biomedicine and Clinical Neuroscience, University of Palermo, Palermo, Italy

²Euro-Mediterranean Institute of Science and Technology, Palermo, Italy

³Dept. of Legal Science, Society and Sports, University of Palermo, Palermo, Italy

⁴Dept. of Oncological Surgery, University of Palermo, Palermo, Italy

⁵Dept. of Chemical, Management, Informatics and Mechanical Engineering, University of Palermo, Palermo, Italy

⁶Dept. of Therapeutic Research and Medicines Evaluation National Institute of Health, Rome, Italy

⁷Dept. of Microbiology and Immunology, School of Medicine, University of Maryland at Baltimore; and IMET, Columbus Center, Baltimore, MD, USA.

* These authors contributed equally to the present work.

Hsp60 is a chaperonin involved in large bowel tumor development and progression. However its value as a tumor biomarker has not been fully elucidated. We studied a population of 97 subjects, including patients and controls. Immunomorphology, Western blotting, and qRT-PCR were carried out on tissue specimens. Exosomes were isolated from blood and characterized by EM, biochemical tests, and Western blotting. Hsp60 increased in cancerous tissue, it was localized in the tumor cell plasma membrane and in the interstitium associated with cells of the immune system, it was associated with exosomes liberated by tumor cells and, as such, circulated in the blood. A noteworthy finding was that these parameters returned to normal shortly after tumor removal. The data suggest that Hsp60 is a good candidate for theranostics applied to large bowel carcinoma and encourage similar research also for other tumors in which Hsp60 has been implicated.