Available online at www.sciencedirect.com
SCIENCE DIRECT
Pathology – Research and Practice 202 (2006) 401–402
PATHOLOGY RESEARCH AND PRACTICE
www.elsevier.de/prp

LETTER TO THE EDITOR

HSP60 expression during carcinogenesis: Where is the pilot?

Dear Editor,

I have read with much interest the article of Mori et al. [9], who used cDNA microarray and immunohistochemical techniques to investigate the expression of four upregulated genes in colorectal cancers, with HSP60 among them. In particular, they showed that HSP60 is overexpressed in the cytoplasm of neoplastic cells, that its intensity is stronger in deep invasive area than in superficial ones, and that carcinomas show stronger immunoreactivity than adenomas. They provided data that are in agreement with our previous results [1]. More recently, we also showed that the expression of HSP60 in primary tumor and lymph node metastasis is correlated with tumor grade [3], confirming independently the results of Mori et al.

In the past, we reported an analogous HSP60 overexpression also in exocervical and prostatic carcinomas [2,5]. Nevertheless, other authors [8] demonstrated that HSP60 could also be downregulated during carcinogenesis, especially the vesical one. We confirmed these data in a large series of bladder transitional cell carcinomas of different grade and stage (unpublished data).

Moreover, we recently reported that HSP60 downregulation may be a novel biomarker during bronchial carcinogenesis [4]. Indeed, we analyzed a series of lung biopsies from smokers, and showed that normal and hyperplastic mucosae displayed cytoplasmic HSP60 expression in most of the epithelial cells, while only few epithelial elements of patients with squamous metaplasia showed the presence of HSP60 in epithelial cells, and its positivity completely disappeared in dysplastic and tumor specimens.

In this letter, we would like to express our opinion: Currently, it is unlikely to confirm that HSP60 overexpression is correlated with cancer development and progression, because it seems to depend on the site of origin of the neoplasm. We presume that the discrepancy of HSP60 expression during carcinogenesis may be due to its pro- and anti-apoptotic roles in tumor cells [6,7], and we hypothesize that its levels are dependent on the expression of other proteins involved in the activation of the apoptotic pathway.

In conclusion, a better knowledge of the molecular pathways, including HSP60 expression during carcinogenesis, will probably expand our prognostic tools and therapeutic targets in the treatment of cancer.

References

[1] F. Cappello, M. Bellafiore, A. Palma, S. David, V. Marciano, T. Bartolotta, C. Sciume, G. Modica, F. Farina, G. Zummo, F. Bucchieri, 60 kDa chaperonin (HSP60) is over-expressed during colorectal carcinogenesis, Eur. J. Histochem. 47 (2003) 105–110.
[2] F. Cappello, M. Bellafiore, A. Palma, V. Marciano, G. Martorana, P. Belfiore, A. Martorana, F. Farina, G. Zummo, F. Bucchieri, Expression of 60-kD heat shock protein increases during carcinogenesis in the uterine exocervix, Pathobiology 70 (2002–2003) 83–88.
[3] F. Cappello, S. David, F. Rappa, F. Bucchieri, L. Marasa, T.E. Bartolotta, F. Farina, G. Zummo, The expression of HSP60 and HSP10 in large bowel carcinomas with lymph node metastase, BMC Cancer 5 (2005) 139.
[4] F. Cappello, A. Di Stefano, S.E. D'Anna, C.F. Donner, G. Zummo, HSP60 immunopositivity as a novel biomarker of bronchial carcinogenesis, Lancet Oncol. 6 (2005) 816.
[5] F. Cappello, F. Rappa, S. David, R. Anzalone, G. Zummo, Immunohistochemical evaluation of PCNA, p53, HSP60, HSP10 and MUC-2 presence and expression in prostate carcinogenesis, Anticancer Res. 23 (2003) 1325–1331.
[6] V. Di Felice, S. David, F. Cappello, F. Farina, G. Zummo, Is chlamydial heat shock protein 60 a risk factor for oncogenesis?, Cell. Mol. Life Sci. 62 (2005) 4–9.
[7] A. Faried, M. Sohda, M. Nakajima, T. Miyazaki, H. Kato, H. Kuwano, Expression of heat-shock protein Hsp60 correlated with the apoptotic index and patient prognosis in human oesophageal squamous cell carcinoma, Eur. J. Cancer 40 (2004) 2804–2811.
[8] T. Lebret, R.W. Watson, V. Molinie, A. O'Neill, C. Gabriel, J.M. Fitzpatrick, H. Botto, Heat shock proteins HSP27, HSP60, HSP70, and HSP90: expression in bladder carcinoma, Cancer 98 (2003) 970–977.

0344-0338/$ - see front matter
doi:10.1016/j.prp.2006.02.002

[9] D. Mori, Y. Nakafusa, K. Miyazaki, O. Tokunaga, Differential expression of Janus kinase 3 (JAK3), matrix metalloproteinase 13 (MMP13), heat shock protein 60 (HSP60), and mouse double minute 2 (MDM2) in human colorectal cancer progression using human cancer cDNA microarrays, Pathol. Res. Pract. 201 (2005) 777–789.

Francesco Cappello, Giovanni Zummo
Department of Experimental Medicine, Section of Human Anatomy, University of Palermo, Via del Vespro 129, 90127 Palermo, Italy
E-mail address: francapp@hotmail.com (F. Cappello)