Overexpression of estrogen receptor alpha in human thyroid papillary carcinoma (TPC)

Maura Di Vito[1], Elena De Santis[2], Giulietta A. P errone[4], Emanuela Mari[1], Maria C. Giordano[4], Luigi Coppola[4], Guido Fadda[5], Marco Tafani[3], Lorenzo Fumagalli[2], Matteo A. Russo[1,3]

[1] Department of Experimental Medicine, University of Rome Sapienza, Italy
[2] Department of Human Anatomy, University of Rome Sapienza, Italy
[3] Lab. of Cellular and Molecular Pathology, IRCCS San Raffaele Pisana, Rome, Italy
[4] UOC Anatomia Patologica, Ospedale San Filippo Neri, Rome, Italy
[5] Institute of Pathologic Anatomy, Catholic University of Rome, Italy

TPC is 3-4 fold more common in premenopausal women than in men, suggesting an involvement of estrogens and their receptors (ERs) in the growth and progression of this tumor. ER alpha (ER-A) and ER beta (ER-B) play a different role in the natural history of tumors originating from breast, endometrium and prostate epithelia, the target-tissues of estrogens, ER-A having a proliferative and antiapoptotic activity, while ER-B displaying differentiative and proapoptotic effects.

The expression of ER isoforms in normal and TPC tissues is still controversial, therefore a more detailed study of distribution of these molecules is needed. Immunohistochemistry appears to be inadequate for reliable quantitative studies. In the molecular biology approach, nucleic acid and protein extraction from whole tissue have generated highly variable data due to the confounding inconstant cellular populations of tissue samples.

In our study we have used the laser capture microdissection to obtain homogeneous leukocyte-free tissue fractions from surgical samples, dissecting only epithelial tissue from tumor or normal host tissue of the same sample. Then they have been analyzed by HT real-time PCR and by WB.

Our results demonstrate that ER-A is constantly overexpressed (200-300 folds) in epithelia microdissected from TPC, as compared with fractions obtained from surrounding normal host tissue. A similar pattern was observed with WB for the ER-A protein. For ER-B we were not able to evidence any change in expression or in amount of protein among different tissue fractions.

To explore a possible clinical use of these data, we have studied 32 needle-aspirate from TPC and 3 from benign goiter lesions, evidencing a similar pattern of ER isoforms, as observed in microdissected tissues.

In conclusion, ER-A may have an important role in the natural history of human TPC already evidenced for classical estrogen target tissues and its overexpression may be evidenced also in routine needle aspirate.

Key words
Estrogen receptors, thyroid carcer