

Increased transglutaminase 2 and GLUT-1 expression in breast tumors not susceptible to chemoprevention with antioxidants

Filipe C Martins^{1,2,3}, Filipa Teixeira^{2,3}, Ines Reis^{2,3}, Nuno Geraldes^{2,3}, AM Silvério Cabrita^{2,3}, and Margarida F Dias^{1,2,3}

¹Gynecology Department, University Hospital of Coimbra, Coimbra; ²Institute of Experimental Pathology, Coimbra Faculty of Medicine, Coimbra; ³CIMAGO, Coimbra Faculty of Medicine, Coimbra, Portugal

ABSTRACT

Goals. Expression of GLUT-1 and transglutaminase 2 is increased in aggressive breast cancer, whereas claudin-1, which is expressed in normal tissues, is absent in such tumors. This experimental study was undertaken to establish the aggressiveness and prognosis of DMBA-induced mammary tumors in female Wistar rats based on the assessment of these markers.

Materials and methods. The rats were divided into two groups, a control group (n = 70) and a chemoprevention group (n = 70). Breast tumors were induced in both groups by administration of 7,12-dimethylbenz[a]anthracene (DMBA). The chemoprevention group also received alpha-tocopherol and a solution of micronutrients containing ascorbic acid and selenium. Neoplastic lesions of both groups were randomly selected for immunohistochemical assessment of the expression of GLUT-1, transglutaminase 2 and claudin-1.

Results. A higher proportion of mammary tumors expressed GLUT-1 and transglutaminase 2 in the chemoprevention group. Claudin-1 expression was absent in all tumors of both groups.

Conclusions. These results are suggestive of increased aggressiveness of tumors not susceptible to chemoprevention by the agents used in this study.

Key words: chemoprevention, antioxidants, breast cancer, prognostic markers.

Acknowledgments: The presentation of this work at the Experimental Biology Annual Meeting 2007, Washington DC, was supported by FLAD, "Fundação Luso-Americana para o Desenvolvimento".

Correspondence to: Filipe Correia Martins, R. Infanta D. Maria, 436, 7º Esq, 3030-331 Coimbra, Portugal.
Tel +351-918-805789;
fax +351-239-704304;
e-mail filipecorreiamartins@gmail.com

Received May 20, 2008;
accepted September 9, 2008.