

European Conference on X-Ray Spectrometry



BOOK OF ABSTRACTS

20 – 25 June 2010
Figueira da Foz, Coimbra
PORTUGAL

<http://exrs2010.fis.uc.pt/>

Trace Elements Levels to Different Types of Breast Tumors in Dogs

S.S. Sakamoto¹, A.L. Andrade¹, M.C.R. Luvizotto¹, S. Will², M. Scapin³,
M.L. Carvalho⁴, A. Antunes⁵

¹ Universidade Estadual Paulista - Unesp Campus, Araçatuba, Brazil

² Departamento de Anatomia, Faculdade de Medicina Veterinária, Universidade de São Paulo, Brazil

³ Instituto de Pesquisas Energéticas e Nucleares IPEN-CNEN/SP, Brazil

⁴ Faculdade de Ciências - Universidade de Lisboa, Portugal

⁵ Instituto de Física- Universidade Federal de Uberlândia, Brazil

E-mail: antunes@infis.ufu.br

The role of the majority of trace elements on biological tissues has been emphasized in the search for the possible causes of cancer. Many studies have been performed, however a classification and diagnosis relationship is not completely known. Comparison of subclasses of malignant tumors has not been widely investigated. The main objective of this work is to identify the concentration of Ca, Fe, Cu and Zn for several types of malignancy. Understanding how each element acts in the breast tumor can provide information about the progression of the pathology, phases and as adjuvant to the indication of the treatment more adequate and prognostic. In this investigation the elemental concentration was determined for canine mammary gland and two types of malignant breast cancer (complex carcinoma and tubule-papillary carcinoma). Twenty one fragments of biopsies were analyzed in this experiment and divided in three groups (G1, Normal mammary gland; G2, complex carcinomas; G3, tubule-papillary carcinoma). Samples of the tumors were collected during surgical procedures, mastectomy, performed at Veterinary Hospital of Sao Paulo University State – Aracatuba. Tissues were collected and lyophilized. Tissues were classified according to the diagnostic criteria proposed by the World Health Organization (WHO) for mammary tumors by a veterinarian pathologist. Analyses were performed at the Institute for Energy and Nuclear Research (IPEN-USP) using energy dispersive X-ray fluorescence equipment. Statistical analysis reveals a significant difference to Ca and Fe levels comparing G1 with G2 and G3. A possible cause to an increase in Ca is associated to calcification areas very common in complex carcinoma and due to inhomogeneity in the tissue. Fe is a singular element in the creation of blood supply sites to growing malignant breast lesions, acting as regulatory factor for angiogenesis. Cu and Zn were involved in both mechanisms of protection and development of the tumor. Our results have appointed to high concentration levels of Ca and Fe in G2 and G3 in comparison with G1.