

DETERMINATION OF INORGANIC ELEMENTS IN BLOOD OF GOLDEN RETRIEVER MUSCULAR DYSTROPHY DOGS USING NEUTRON ACTIVATION ANALYSIS

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In recent years, the Nuclear Structure Laboratory at IPEN – CNEN/SP (Brazil) has performed measurements related to the determination of inorganic elements in blood of animals used for experimentation (rats, rabbits, mice) using Neutron Activation Analysis technique (NAA). The advantage in using NAA to investigate blood is related to the fact that this analytic technique uses small quantity of blood (10 to 100 µL) when compared with the conventional clinical practices performed in serum (0.5 to 1.0 mL), resulting in an efficiency procedure for biochemical analysis mainly when the biological material is scarce. The success in these applications, with small and medium-sized animal models, has motivated us to study in more details the anomalies caused by Duchenne Muscular Dystrophy (DMD), an illness of hereditary character that affects approximately 1 in every 3,600 to 6,000 live male births in the world. Nowadays, many promising therapeutic strategies have been developed in animal models with DMD. An animal model which has a phenotype similar to patients with DMD has been bred in Brazil: Golden Retriever Muscular Dystrophy dogs (GRMD). In these dogs, muscle degeneration and fibrosis are predominating, leading to a progressive loss of structure and muscle function, and resembling a human pathogenesis. In this study, elements of clinical relevance (Ca, Cl, Mg, K, Na) were determined in blood of the GRMD using NAA at the IEA - R1 nuclear reactor. These data may help to evaluate the efficiency of new treatments as well as to compare the advantages of different treatment schedules before performing tests in patients with DMD.