

Biomarcadores numa perspetiva de “Uma Só Saúde”: conhecimento atual da sua capacidade de unir a saúde humana e animal

Biomarkers in a *One Health* perspective: current knowledge of their ability to merge human and animal health

Catarina Lavrador^{a,c,1}, Ricardo Abreu de Assunção^{b,c,d}, Paula Soromenho de Alvito^b,
Elsa Leclerc Duarte^{a,c}

^aICAAM – Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora,
7002-554 Évora, Portugal

^bFood and Nutrition Department, National Institute of Health Dr. Ricardo Jorge, Portugal;
^cUniversidade de Évora, Portugal, 7002-554 Évora, Portugal;

^dCentre for Environmental and Marine Studies, Faculty of Sciences, University of Lisbon,
Portugal.

ABSTRACT

Biomarkers are nowadays essential tools to be one step ahead for fighting disease, enabling an enhanced focus on disease prevention and on the probability of its occurrence. Research in a multidisciplinary approach has been an important step towards the repeated discovery of new biomarkers.

Biomarkers are defined as biochemical measurable indicators of the presence of disease or as indicators for monitoring disease progression. Currently, biomarkers have been used in several domains such as oncology, neurology, cardiovascular, inflammatory and respiratory disease, and several endocrinopathies. Bridging biomarkers in a *One Health* perspective has been proven useful in almost all of these domains.

In oncology, humans and animals are found to be subject to the same environmental and genetic predisposing factors: examples include the existence of mutations in BR-CA1 gene predisposing to breast cancer, both in human and dogs, with increased prevalence in certain dog breeds and human ethnic groups. Also, breast feeding frequency and duration has been related to a decreased risk of breast cancer in women and bitches.

When it comes to infectious diseases, this parallelism is prone to be even more important, for as much as 75% of all emerging diseases are believed to be zoonotic. Examples of successful use of biomarkers have been found in several zoonotic diseases such as Ebola, dengue, leptospirosis or West Nile virus infections.

Acute Phase Proteins (APPs) have been used for quite some time as biomarkers of inflammatory conditions. These have been used in human health but also in the veterinary field such as in mastitis evaluation and PRRS (porcine respiratory and reproductive syndrome) diagnosis. Advantages rely on the fact that these biomarkers

can be much easier to assess than other conventional disease diagnostic approaches (example: measured in easy to collect saliva samples).

Another domain in which biomarkers have been essential is food safety: the possibility to measure exposure to chemical contaminants or other biohazards present in the food chain, which are sometimes analytical challenges due to their low bioavailability in body fluids, is nowadays a major breakthrough.

Finally, biomarkers are considered the key to provide more personalized therapies, with more efficient outcomes and fewer side effects. This approach is expected to be the correct path to follow also in veterinary medicine, in the near future.