Poisonous plants and mycotoxins are two of the main causes of economic losses to Brazilian animal livestock industry. Besides animal death losses, other consequences from the prolonged exposure to toxins are the reduced animal body weight gains and production, reproductive impairments, abortions, birth defects, and immunosuppression with subclinical or short-term illness. Furthermore, plant-associated toxins may negatively impact food safety and contaminate human food.

The immune system is pivotal in host defense against infectious agents and neoplasia, which is a highly integrated network of cells. Xenobiotics that alter immune cells functions, can also potentially injure these cells, disrupting the immune responses and altering host resistance. The aims of the present study includes the evaluation of the potential immunotoxicity and teratogenic effects of some plants and mycotoxins to both livestock and human health. In addition, we propose to improve current immune and teratogenic test protocols employed by regulatory agencies of risk assessment.

_Pteridium aquilinum_ is a plant founded worldwide and epidemiological studies have revealed a higher risk of cancer in people who consume this plant directly or indirectly through milk from animals that are feeded with this plant species. In cattle, it has been showed that chronic exposure induces urinary bladder carcinomas and carcinomas of the upper alimentary tract. There are evidences of association between these carcinomas and chronic intoxication by _P. aquilinum_ ingestion and bovine papilloma virus infection. Thus, it is plausible that the observed increasing in cancers diseases could be related to induction of an overall immunosuppression by this plant. Considering this, our study has evaluating the immunosuppressive effects of _P. aquilinum_ in mice.

Monocrotaline (MCT) is a pyrrolizidine alkaloid found in a variety of plants, including _Crotalaria spp_, which are largely distributed in Brazil. The main symptoms of MCT toxicities in livestock are related to hepato- and nephrotoxicity. Although studies have shown that MCT can cause effects on cellular functions that would be critical to lymphocytes/macrophages during a normal immune response, no immunotoxicological study on MCT have been performed yet. Thus, the aim of the present study is to evaluate MCT effect on different branches of the immune system using mice as animal model.
Histological analyses of C57BL/6 mice administered with *P. aquilinum* extracts revealed a significant reduction in spleen white pulp area. A variety of immune response were analyzed in these animals including delayed-type hypersensitivity (DTH) and decreased IFN-γ production by NK cells during TH1 priming. The innate response in these hosts, assessed by analysis of NK cell cytotoxic functionality was also diminished in comparison to control animals in the assay. These results have confirmed the expected immunosuppressive effects of *P. aquilinum*. Thus, many of the modulated immune responses can contribute to the increased risk of cancer in exposed hosts.

Rats treated with MCT have their lymphoid organs, acquired immune responses, and macrophage (MO) activity evaluated. No significative changes in the relative weight of lymphoid organs were observed. However, it was observed a decrease in the bone marrow cellularization in rats treated with MCT. Treatments with MCT caused no significant alterations in phagocytic function or in hydrogen peroxide production, however, the MCT causes compromised nitric oxide release by these cells. In conclusion, these results have shown that MCT causes myelotoxic effects and interferes in the formation of at least one product critical to the inflammatory process. Future experiments will be conducted to determine which bone marrow cell lines are affected by MCT, and the roles of iNOS and NO in the inflammatory process. We will also analyze if the effects of this compound, on alveolar macrophages, could be a factor in the pulmonary hypertension known to be induced by this alkaloid.