

## 1.Objectives

To evaluate the use of the main acute phase proteins (APP) in the clinical practice of small animal medicine.

## 2.Introduction

The acute phase reaction (APR) is an unspecific process that occurs after any noxious stimuli. The APR is characterized by the presence of fever, anorexia, leukocytosis, and the production of APP (Figure 1).

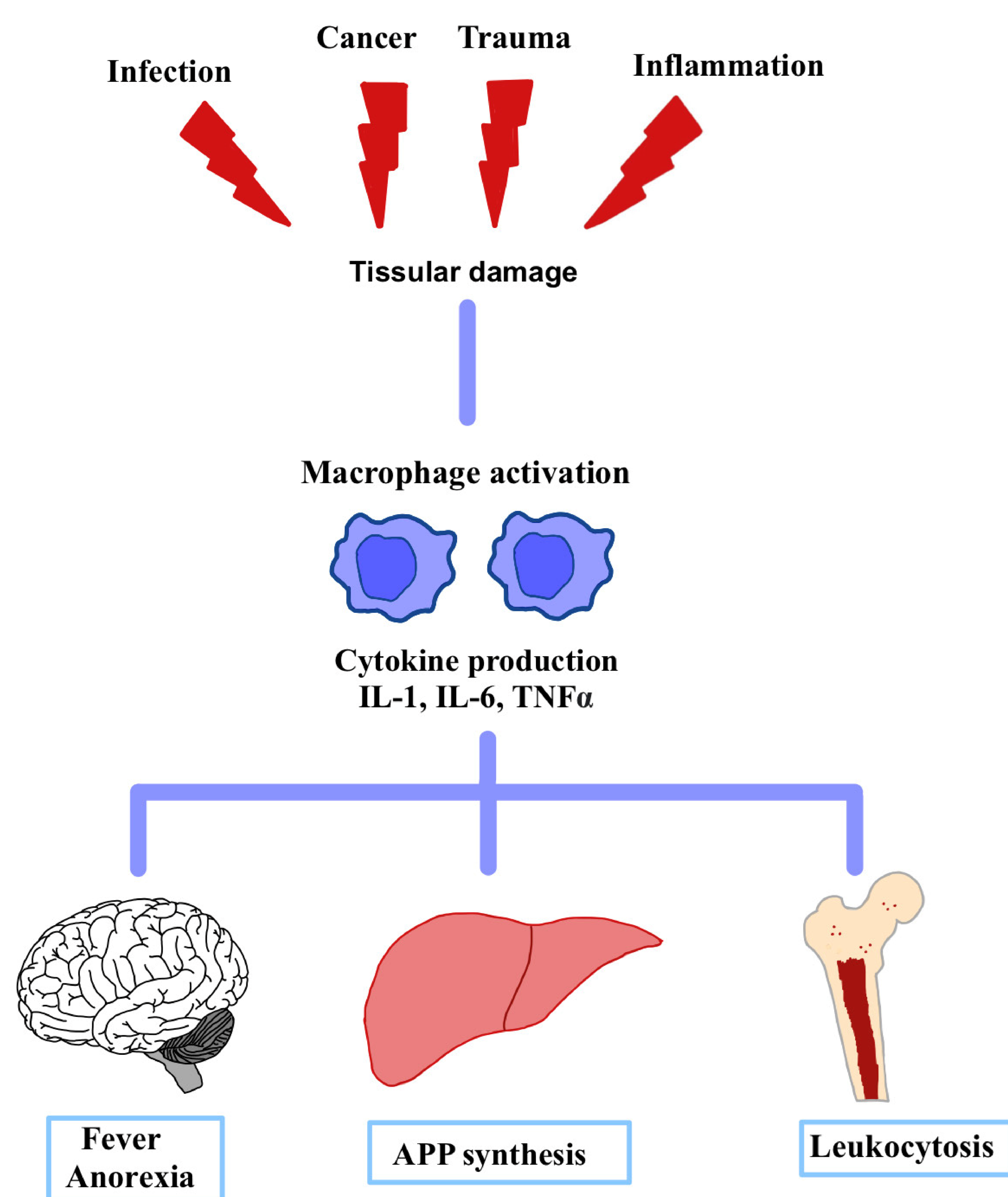


Figure 1. General mechanism of acute phase proteins synthesis.

## 3.Acute phase proteins

The production of APP occurs mainly in the liver after the induction of proinflammatory cytokines such as IL-1, IL-6 and TNF $\alpha$  during an APR. There are different types of APP based on their kinetics (Figure 2).

## 4.Acute phase proteins as biomarkers of disease

The different APP have some benefits as biomarkers over traditional parameters. APP respond to an APR with more sensitivity than leukocyte changes. The main disadvantage of APP as biomarkers is the lack of specificity.

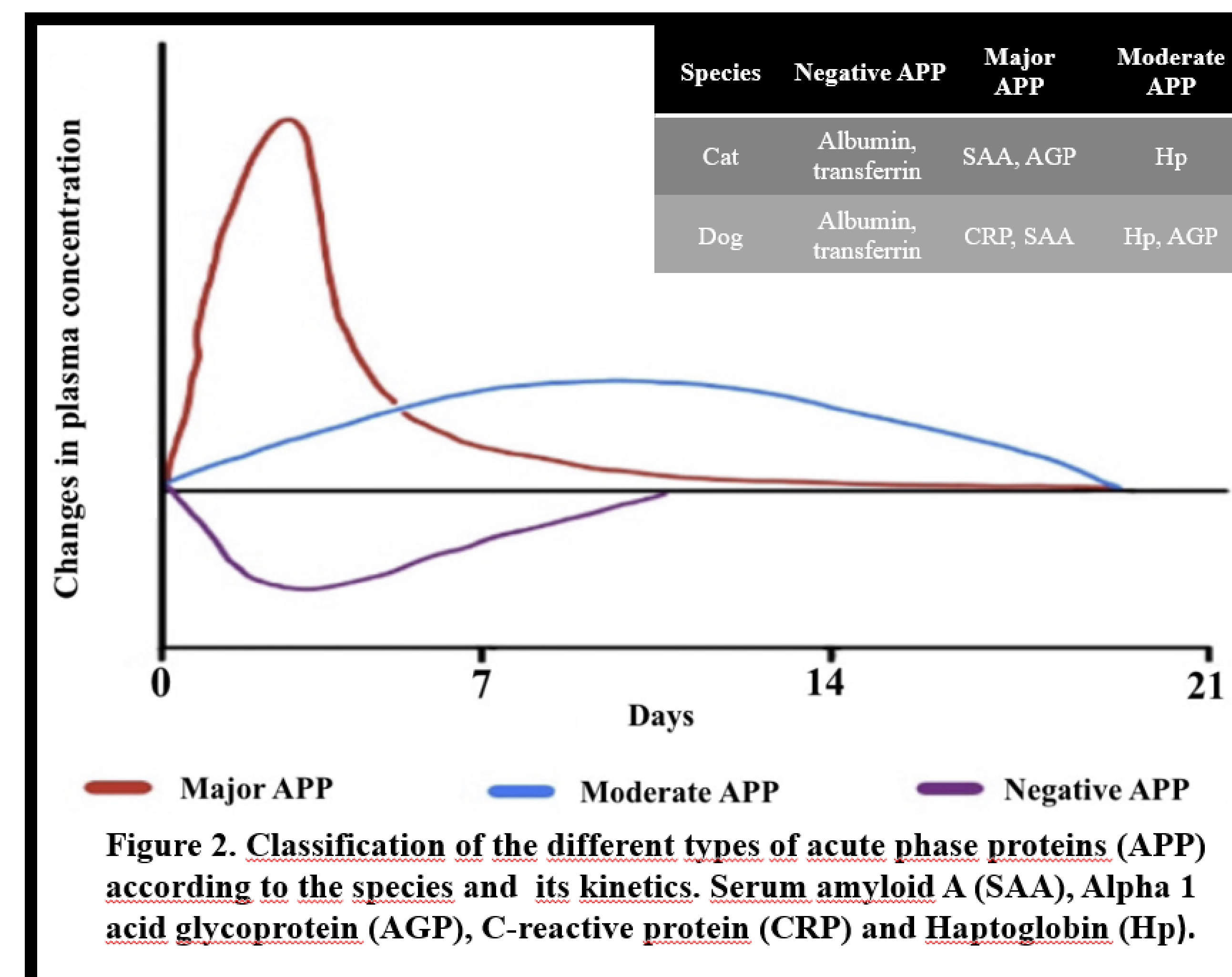


Figure 2. Classification of the different types of acute phase proteins (APP) according to the species and its kinetics. Serum amyloid A (SAA), Alpha 1 acid glycoprotein (AGP), C-reactive protein (CRP) and Haptoglobin (Hp).

Disease	APP concentration	Useful for
Canine bacterial pneumonia	CRP >100 mg/L SAA >1000 mg/L	. Diagnostics . Prognosis . Monitoring treatment
Canine pancreatitis	CRP >65 mg/L after three days of treatment	. Prognosis . Monitoring
Canine immune-mediated polyarthritis	CRP >100 mg/L	. Diagnostics . Monitoring treatment
Surgery	CRP >43,9mg/L SAA >63,8 mg/L 6 days post surgery	. Monitoring post surgery complications.
SRMA	CRP > 80 mg/L	. Diagnostics . Monitoring treatment
Heart diseases	CRP > 15 mg/L or increases during treatment.	. Staging of the disease . Monitoring treatment
FIP	AGP > 1550 ug/mL in effusion	. Diagnostics
Canine parvovirus	CRP >92,4 mg/L	. Prognosis
Leishmaniasis	CRP >25 mg/L	. Prognosis
Inflammatory enteropathies	CRP > 9,1 mg/L	. Diagnostics
Immune mediated hemolytic anemia	CRP > 143 mg/L	. Monitoring

Table 1. Clinical interpretation of different levels of acute phase proteins (APP), C-reactive protein (CRP), Serum amyloid A (SAA), Alpha 1 acid glycoprotein (AGP) in different clinical presentations. SRMA (Steroid responsive meningitis-arteritis) FIP (Feline infectious peritonitis).

## 5. Conclusions

APP changes have been reviewed in a multitude of diseases affecting dogs and cats, thus the determination of APP for diagnostics, monitoring and prognosis of diseases may be an useful tool. APP give valuable information to the clinician and may serve as a molecular thermometer, that although is unspecific, it helps in building the clinical picture of the patient.