

Objectives:

This bibliographic review aims to look over each canine blood types and provide scientifically and clinically relevant considerations about natural antibodies and blood donors, as well as incompatible transfusional reactions.

BLOOD TYPES

DEA 1

It is a complex autosomal dominant allelic system with varied degrees of DEA 1+. Approximately half of all dogs are DEA 1+.

DEA 3 and 5

Those are a two-phenotype system with DEA 3 and 5, respectively, being dominant. The prevalence of dogs positive for DEA 3 and DEA 5 is low.

DEA 4

It is classified as a high-frequency antigen, with a prevalence of >97%.

DEA 6 and 8

Those are a two-phenotype system with DEA 6 and 8, respectively, being dominant. Typing sera for DEA 6 no longer exists.

DEA 7

DEA 7 is produced in the body in a soluble form and adsorbed onto the cell membrane. This antigen is structurally related to a common bacterial antigen and that is why natural antibodies against DEA 7 are thought to be found.

Dal

It is a newer antigen. The vast majority of blood donors are Dal+. Thus, Dal- individuals face a high risk of transfusion incompatibility.

Kai 1 and 2

It is a newer antigen. Either Kai 1 or Kai 2 can be expressed, but not both coexisting in the same dog.

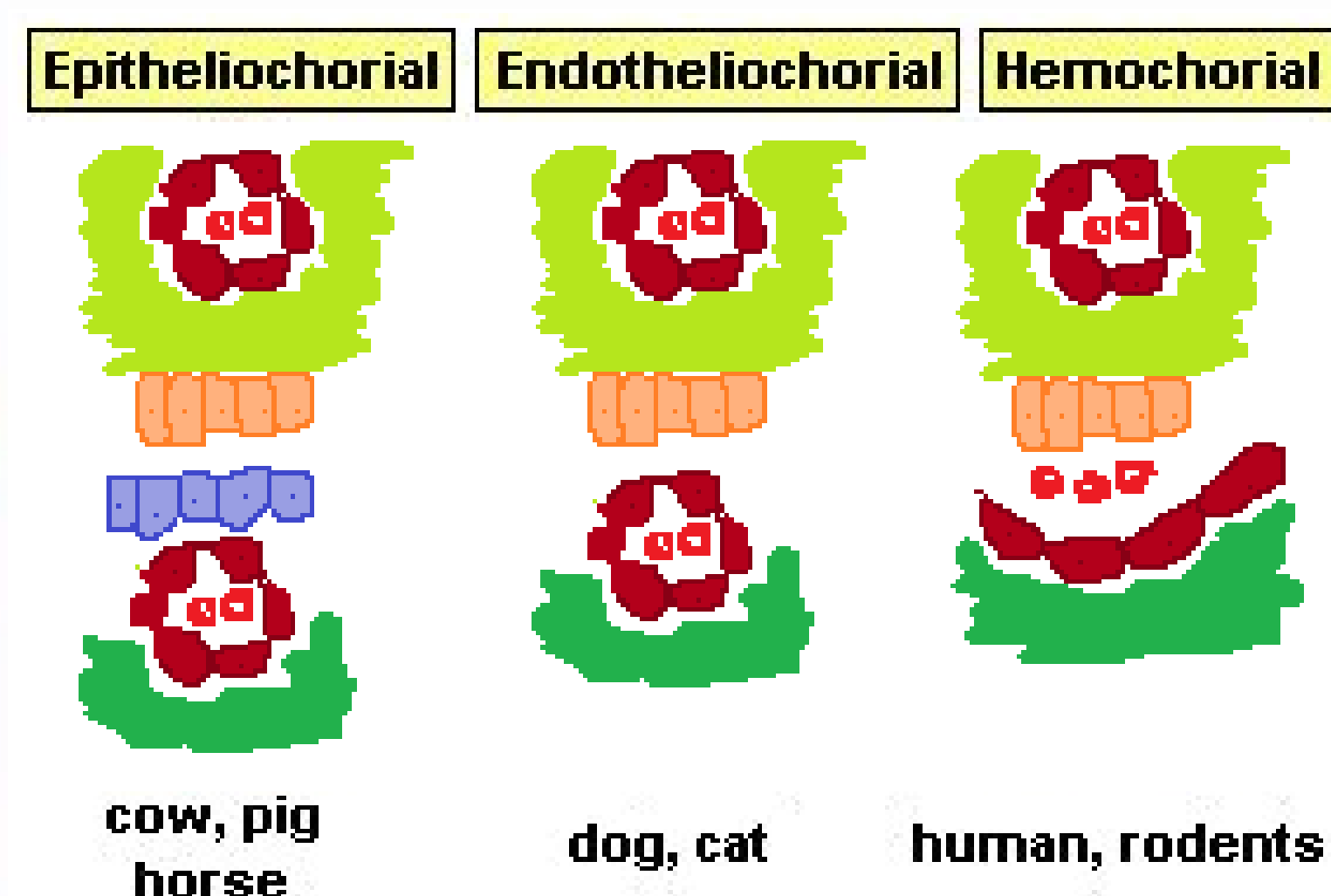
NATURAL ANTIBODIES

Neither naturally occurring anti-DEA 1 nor anti-Kai 1 or Kai 2 antibodies have been described. However, it has been shown that they are present in some dogs for DEA 3, DEA 5 and DEA 7.

The most common ones are against DEA 7 and they are likely produced in response to environmental substances that resemble RBC antigens.

BLOOD DONORS

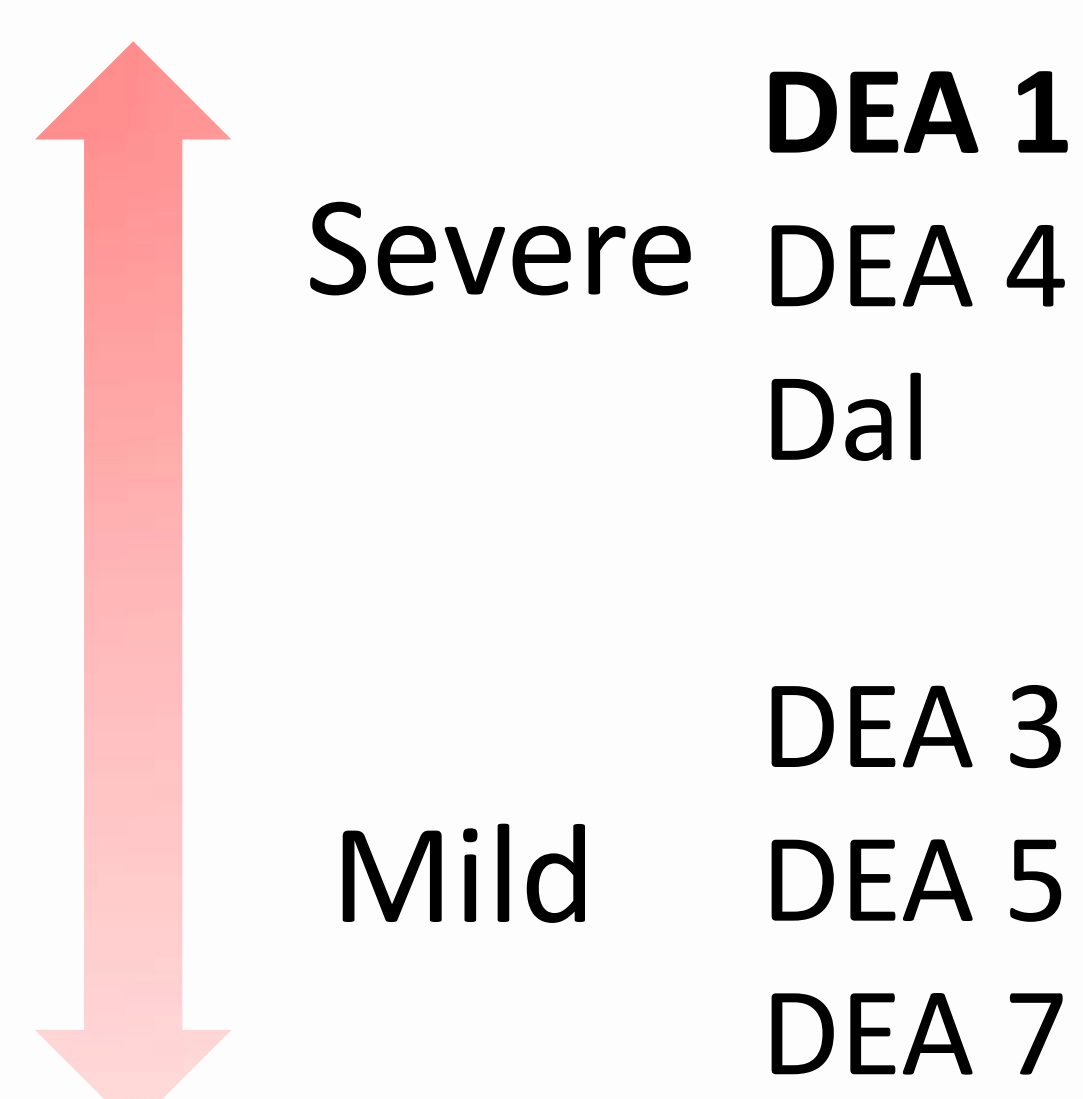
- Galgo and Corso breeds are used as blood donors but no breed has been characterized as being a “universal donor”.
- A universal donor in dogs may be considered to be negative for DEA 1, DEA 3, DEA 5 and DEA 7. Even though, this definition may not be accepted by all clinicians



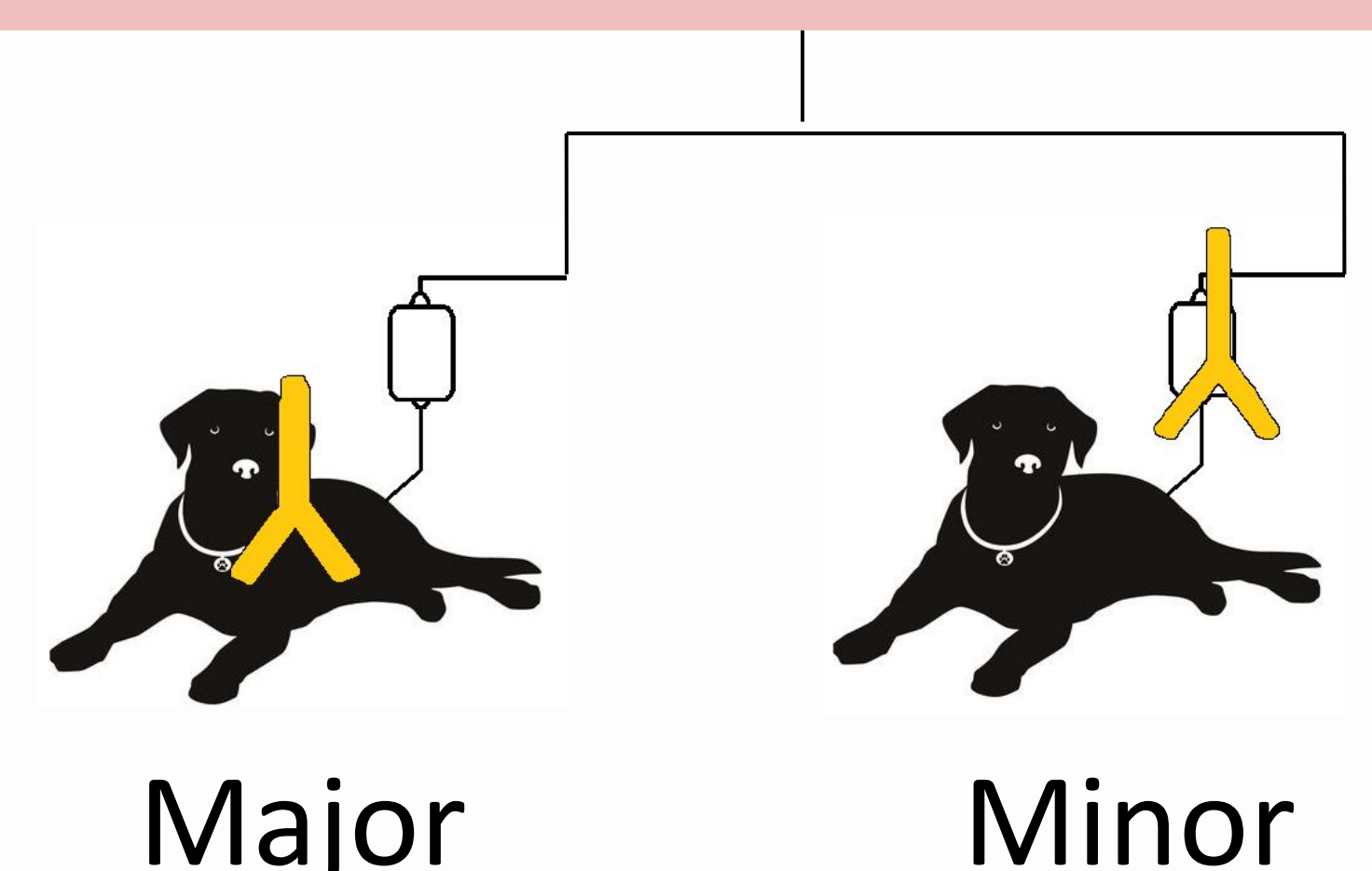
- Pregnancy does not appear to sensitize dogs to RBC antigens due to their endoepithelial placenta, in contrast to what can occur in others species. Consequently, dogs with prior history of pregnancy can be used safely as blood donors.

CONSEQUENCES IN TRANSFUSIONAL MEDICINE

Immunogenicity



Crossmatch



A compatible crossmatch does not completely eliminate the risk of a transfusion reaction.

Conclusions:

- The clinical importance of the newer blood types Dal, Kai 1 and Kai 2 needs to be determined.
- Only DEA 3, 5 and 7 natural antibodies have been reported.
- There is not yet a consensus to determine a universal canine donor profile.
- Pregnancy does not seem to sensitize dogs to antigens on RBCs.
- DEA 1.1, 4 and Dal are the most immunogenic antigens.
- The crossmatching should be prior to transfusion, even for the first transfusion, to minimize the risk of a transfusional reaction.