

## IT'S ALL ABOUT MEMORY

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### **ABSTRACT**

This short overview introduces the fundamental scientific concepts of immunological memory, vaccination, and the effects of ageing on these parameters, which were the focus of the second Meril European Comparative Vaccinology Symposium (MECVS) held in Prague from 13th-15th May, 2009. Significant differences in the way that ageing impacts on different domestic animal species are reviewed.

## Titre 1

There is a strong analogy between the immune system and the central nervous system. Both have an 'innate' and an 'adaptive' (acquired) part and both adaptive parts must be 'educated'. The innate immune system plays a key role for the survival of the animal and responds to stimuli such as the 'danger' signal in connection with Toll-like receptors, but is devoid of memory. The adaptive immune system, responsible for the immune response against specific immunogens, also plays a key role and memorizes the immunogenic signal; it is the main system responding to vaccination.

Like the central nervous system, the immune system ages and the memory of the adaptive immune system fades with age. Like the central nervous system, the adaptive immune system has a better learning capacity while the animal is still young. This applies equally to animals and man. And just as one learns better when young, vaccination should be carried out at an early age to obtain better and lasting protection. The best way to 'educate' the immune system is by vaccination.

It should be remembered that in veterinary medicine the life expectancy of food producing domestic species varies according to the production system, and the requirements for the expected duration of protection in response to vaccination will vary accordingly (e.g. layer hens live longer than broilers). There is no 'ageing' to speak of in some production animals (e.g. fattening pigs, broilers and beef cattle), while companion animals (including horses) often live to an old age. In general, small dogs live longer than larger ones. In dogs there can be large phenotypic differences, also in response to vaccination. Data obtained through the UK Pet Travel Scheme have shown that there are differences in immune response following vaccination against rabies according to the breed of dog (Kennedy et al., 2007).

Furthermore, in veterinary medicine there is an urgent need to have in-vitro correlates of duration of protection in order to better implement the major objectives of animal experimentation: replacement, reduction and refinement.

The 2009 MECVS the papers of which are presented in this supplement to the Journal of Comparative Pathology, focused on immune memory, ageing and the expected duration of immune protection in man and domestic animals.

## Conflict of Interest

The author was co-organizer and an invited speaker at the Merical European Comparative Vaccinology Symposium and received travel expenses and an honorarium for this presentation.

## References

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