POSTER
ANIMAL BEHAVIOUR

Canine EEG transients in the sigma range relate to memory

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Conflict of interest
The authors declare no conflict of interest

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Introduction
Sleep spindles are brief bursts of cortico-thalamo-cortical activity which are visible in the cortex as transient oscillations in the sigma range (usually defined as 12-14 Hz or 9-16 Hz). In humans and rodents, they have been associated with sleep-dependent memory consolidation and sleep stability, as well as mechanisms that could plausibly explain these relationships. In addition, sleep spindles were also found to change in occurrence, frequency, amplitude and duration in response to age, sex and psychiatric conditions. Although the dog represents a promising model of human (social) behavior, brain function, and aging, spindle analogue activity has only been described and never systematically quantified and related to function in this species.

Material and methods
In the present study we used an adjusted version of a detection method previously tested in human children and a data set of EEG and memory measurements obtained from dogs, to test the predictive validity of automatic detections in the dog as a potential model of the human spindle.

Results
We found that the density of EEG transients in the 9-16 Hz range and non-REM sleep phase reflect the same relationship to memory and sexual dimorphism as in humans. However, age-related effects were only marginally significant, and could have been masked by the sample size and large sex differences in spindle density.

Conclusion
We conclude that automatic detections in the 9-16 Hz range are promising analogues of human spindles and can potentially widen the utility of non-invasive polysomnographic methods in this species.