

Supplementary information S2 (box) | Methods and strategy of dream neuroscience

Human subjects	Animal models
Collect and analyze dream reports from journals and tape recordings	Not available
Record polygraphic sleep in laboratories and at home	Record polygraphic sleep Experimental lesions Electrical stimulation Microelectrode for cells Microinjection of chemicals
Image brain during sleep using MRI, PET, SPECT	Image brain during sleep using MRI, PET, SPECT

Dream science integrates data from a variety of techniques in humans and animals (see table). The collection of (objective) third-person data is a check and a constraint against the unreliability of first-person (subjective) reports. The universality of formal dream features in humans and the homologous nature of sleep in most mammals give the enterprise scientific solidity.

Scientific dream research begins with the collection and analysis of subjective reports. The data from these reports are correlated with physiological recording data in a sleep lab or at home using portable devices. Hence, there can be mapping from human mind to human brain and from human brain to animal brain. This approach assumes homology between humans and other mammals at the level of the subcortical brain.

In animal models, more-detailed information about the neurophysiology is obtained through lesions and brain stimulation, microelectrode single cell recording,

and neuropharmacological microinjection techniques. These data can be correlated with polygraph sleep data and inferences made about human physiology that might explain the observed differences in psychology that characterize waking, sleeping, and dreaming.

Brain imaging can be used in both human and animal subjects to detect regional activation patterns associated with sleep physiology and dream psychology, although to date, there has been little brain imaging study of animal sleep. This is unfortunate because it is from animal models that we obtain the cellular and molecular level evidence on which theory building depends.