Of the three principles that define the BLOA, I will outline two principles, there are biological correlates of behavior, and animal research can provide insight into human behavior.

Principle One: There are biological correlates of behavior. This means that there are physiological options of behavior such as neurotransmitters, hormones, specialized brain areas, and genes. The biological level of analysis is based on reductionism, which is an attempt to explain complex behavior in terms of simple causes. Research that demonstrates principle 1 is Newcomer et al. (1999). Newcomer et al. (1999) performed an experiment on the role of the stress hormone cortisol on verbal declarative memory.

Group 1 (high dose cortisol) had tablets containing 160 mg of cortisol for four days.

Group 2 (low dose cortisol) had tablets with 40 mg of cortisol for four days.

Group 3 (control) had placebo tablets.

Participants listened to a prose paragraph and had to recall it as a test of verbal declarative memory. This memory system is often negatively affected by the increased cortisol under long-term stress. The result showed that group 1 showed the worst performance on the memory test compared to groups 2 and 3. The experiment shows that an increase in cortisol over a period has a negative effect on memory.

Principle Two: Animal research can provide insight into human behavior. This means that researchers use animals to study physiological processes because it is assumed that most biological processes in non-human animals are the same as in humans. One important reason for using animals is that there is a lot of research where animals cannot be used for ethical reasons. Research that demonstrates principle 2 is Rosenzweig and Bennet (1972). Rosenzweig and Bennet (1972) performed an experiment to study the role of environmental factors on brain plasticity using rats as participants. Brain plasticity refers to changes in neural pathways and synapses due to changes in behavior, environment, neural processes, thinking, emotions, as well as changes resulting from bodily injury.

Group 1 was placed in an enriched environment with lots of toys

Group 2 was placed in a deprived environment with no toys. The rats spent 30 or 60 days in their respective environments before being euthanized. The brains of the rats in group 1 showed a thicker layer of neurons in the cortex compared to the deprived group. The study shows that the brain grows more neurons if stimulated.

(The alternative principle which can be substituted for either Principle One or Two.)

Principle Three: Human behavior is, to some extent, genetically based. This means that behavior can, to some extent, be explained by genetic inheritance, although this is rarely the full explanation since genetic inheritance can be seen as genetic predisposition which can be affected by environmental factors.

Researchers interested in the genetic origin of behavior often used twins so that they can compare one twin with the other on a variable such as intelligence, depression or anorexia nervosa.

Identical twins (monozygotic – MZ) are 100 per cent genetically identical as they have developed from the same egg. They therefore act as a control for each other. Fraternal twins (dizygotic twins – DZ) have developed from two different eggs. They share around 50 per cent of their genes so they are no more similar than siblings.

Twin research never shows a 100 per cent concordance rate – the probability that a pair of individuals will both have a certain characteristic, given that one of the pair has the characteristic. For example, twins are concordant when both have or both lack a given trait. Thus, it is believed that genes are a predisposing factor rather than a cause of a behavior. Therefore, it is also important to consider what environmental factors could influence the expression of the genetic predisposition.

Research that demonstrates principle 3 is Bouchard et al. (1990). Bouchard et al. (1990) performed the Minnesota twin study, a longitudinal study investigating the relative role of genes in IQ. The participants were MZ reared apart (MZA) and MZ reared together (MZT). The researchers found that MZT had a concordance rate of IQ of 86 per cent compared with MZA with a concordance rate of IQ of 76 per cent. This shows a link between genetic inheritance and intelligence but it does not rule out the role of the environment.