The purpose of Dr. Bach’s study was to understand multisensory integration by fully understanding the anatomy and function of the superior colliculus and how multisensory is enhanced. The superior colliculus plays a huge factor in multisensory integration because it is a sensorimotor that directs behavioral responses due to stimuli produced by modality specific and cross modal sensory. This research was tested on cats and transgenic mice.

In order to carry out this study the cats had surgical procedures. It began by shaving and cleaning the scalp. The cats were then intubated and placed on a stereotaxic head holder. The cats were put under anesthesia and their vital signs were monitored. In order for the researchers to gain access to the superior colliculus, a small incision was made in the scalp, allowing for a craniotomy. The researchers put contacts on the cat’s eyes and placed electrodes in the intermediate and deep portions of the superior colliculus. The researchers were able to isolate neuronal responses for both, vision and auditory. In order to test the two, flashes or moving bars of light moved across the screen and noise bursts played 15 cm away from the cat’s head. Dr. Bach also ran this same experiment in transgenic mice to see if these multisensory principles translated to the mice specie because multisensory integration had been established in this type of animal. Both animals were tested for modality specific and cross modal sensory responses. To be specific they tested the multisensory interactions through spatiotemporally concordant and temporally disparate cues. They tested the animals for vision and auditory separately, as well as together.

In conclusion, the researchers found that a patterned stimulus leads to an increase in multisensory enhancement. This result is due to multiple rising phases. It is also concluded that the mouse model is a great model to test for multisensory integration because of their behavioral states and preliminary studies. In order to enhance the study, Dr. Bach plans to understand dopamine influences and test optogenetics in the transgenic animals.