Dear Dr. Werth,

We would kindly ask you to consider the manuscript entitled,

"Automated gait analysis to assess functional recovery in rodents with peripheral nerve or spinal cord contusion injury"

for publication in the Journal of Visualized Experiments.

We would like to express our sincere gratitude and appreciation for your invitation to submit our work to the Journal of Visualized Experiments.

Peripheral and central nervous injuries are commonly studied in rats with the intention to develop new treatment options or neuroprotective strategies. Nerve regeneration in rodent models is assessable by a wide variety of techniques, e.g. histology or electrophysiology. However, the degree of functional recovery is the most important criterion to determine the success of an experimental treatment or neuroprotective approach.

In this work, we show how to evaluate functional recovery in rodent models of sciatic nerve, femoral nerve and spinal cord contusion injury using automated gait analysis. Our manuscript aims to underscore the method's main strength, which is the ability to assess motor and sensory reinnervation while using only one device and setup. To accomplish this aim, our manuscript discusses all important prerequisites and crucial steps regarding training of the animals, data acquisition and data classification. Additionally, limitations and pitfalls such as the need for meticulous hard- and software adjustments as well as sufficient training of the experimental animals are emphasized.

We hereby present a comprehensive and detailed protocol on how to study motor and sensory recovery in various rodent models of peripheral and central nervous injuries via automated gait analysis. We are convinced that our work can contribute to promote optimum use of this evaluation method, supporting valid and reliable assessment of functional recovery in small animal models.

We would be grateful for your consideration.

Yours sincerely,

Johannes Heinzel