Dr. Andrii Domanskyi is a neuroscientist with more than 18 years of combined experience in both the industrial sector and international academic settings. His expertise centers on the use of in vivo and ex vivo models to investigate neurodegenerative diseases and chronic pain.

Dr. Domanskyi completed his PhD at the University of Helsinki in Finland. After earning his doctorate, he joined the German Cancer Research Center (DKFZ Heidelberg) as a postdoctoral scientist, where he spent seven years developing and characterizing innovative in vivo models of neurodegenerative diseases.

Following his postdoctoral appointment, Dr. Domanskyi returned to Finland to serve as a senior scientist. In this role, he focused on exploring the therapeutic potential of neuronal stem cells for neurorepair in neurodegenerative diseases and ischemic stroke. He subsequently secured funding to establish his own research group at the Institute of Biotechnology, University of Helsinki. There, his group developed both in vivo and in vitro models as well as high-content drug screening assays targeting pathological protein aggregation.

Currently, Dr. Domanskyi is a Senior Research Scientist at Orion Pharma in Finland. In this position, he is responsible for designing and overseeing pre-clinical efficacy studies using in vivo and ex vivo models to study inflammatory, neuropathic, and osteoarthritis-related chronic pain. He also manages outsourced studies and leads pre-clinical research projects within the organization.

Abstract:

Osteoarthritis remains a major contributor to chronic pain, with currently available pharmacological treatments often proving limited and insufficient. A significant challenge in developing effective analgesics lies in accurately assessing pain behavior in preclinical rodent models. Recent advancements in machine learning algorithms and computational resources have enabled the automated detection and quantification of diverse behavioral parameters from video recordings of freely moving rodents. BlackBox imaging platform, capable of recording animal movements, body posture, and weight distribution across paws, has demonstrated efficacy in capturing and quantifying pain-related behaviors in various models.

We validated the BlackBox platform for its capacity to automatically acquire and analyze reliable, quantitative, and objective data relating to spontaneous and unrestricted pain-like behaviors in rats. Several behavioral parameters were identified as altered in monoarthritic pain models, which were induced by complete Freund's adjuvant (CFA) tibiotarsal or monosodium iodoacetate (MIA) knee intra-articular injections in rats. To evaluate the significance of these behavioral readouts in relation to pain phenotype, animals received a single intravenous injection of anti-NGF antibody (tanezumab), a clinically established analgesic proven effective in osteoarthritis pain management.

We compared the performance of the BlackBox and CatWalk XT platforms in assessing static weight bearing and found that BlackBox also detected additional behavioral parameters responsive to tanezumab treatment. Both systems confirmed reduced weight bearing on the injured paw in CFA and MIA models—a deficit attenuated by tanezumab administration. Collectively, our findings strongly endorse the BlackBox system as an effective tool for quantifying pain behavior in rat osteoarthritis models.