

Ricin

Intrasciatic nerve injection of the Ricinus communis agglutinin (RCA or ricin) causes [motor neuron disease](#) with functional deficits, such as those that occur in [amyotrophic lateral sclerosis](#) (ALS).

The objective of a study of Liang et al., from [Johns Hopkins Hospital, Baltimore](#), was to develop a new comprehensive platform for quantitative evaluation of [motor neuron](#) (MN) loss, muscular [atrophy](#) and behavioral deficits using different ricin injection regimens.

[Fluorogold](#) (FG)-guided [stereology](#) of MNs, in vivo magnetic resonance imaging (MRI) of muscular atrophy, and [CatWalk](#) behavioral testing were used to evaluate the outcome of rats treated with different ricin regimens (RCA60 0.5 µg, RCA60 3 µg, and RCA120 6 µg) as animal models of MN degeneration.

FG-guided stereological counting of MNs enabled identification, dissection and robust quantification of ricin-induced MN loss. The RCA60 0.5 µg and RCA120 6 µg regimens were found to be best suited as preclinical MN depletion models, with a low mortality and a reproducible MN loss, accompanied by muscle atrophy and functional deficits evaluated by MRI and the CatWalk method, respectively.

1) Fluorogold neuronal tracing provides a robust and straightforward means for quantifying MN loss in the spinal cord; 2) MRI is well-suited to non-invasively assess muscle atrophy; and 3) The CatWalk method is more flexible than rotarod test for studying motor deficits.

Intrasciatic injection of RCA60 or RCA120 induces nerve injury and muscle atrophy, which can be properly evaluated by a comprehensive platform using FG-guided quantitative 3D topographic histological analysis, MRI and the CatWalk behavioral test ¹⁾.

¹⁾

Liang Y, Zhang J, Walczak P, Bulte JWM. Quantification of Motor Neuron Loss and Muscular Atrophy in Ricin-Induced Focal Nerve Injury. J Neurosci Methods. 2018 Jul 26. pii: S0165-0270(18)30221-8. doi: 10.1016/j.jneumeth.2018.07.014. [Epub ahead of print] PubMed PMID: 30056087.

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