

**ABSTRACT****MORPHOLOGICAL RESPONSE OF PURKINJE CEREBELLUM CELLS  
AS THE EFFECTS OF MOTOR STIMULUS VARIATIONS  
ON YOUNG MUS MUSCULUS****By:  
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This research was aimed at defining a model of motor stimuli for increasing the neurogenesis and proliferacy of Purkinje Cerebellum cells. There were four types of motor stimulus variations applied. (1)Free movement motor stimulus variation (BB), (2)Free movement motor stimulus variation with a training of with 12-minute-without-weight-aerobic-swimming (BBA), (3)Limited movement motor stimulus variation with a training of 12-minute-without-weight-aerobic-swimming (TBBA) and (4)Limited movement motor stimulus variation (control).

The research was a laboratory experimental research. The design used was Randomized Subjects Posttest Only Control Group design. It was conducted in macroscopic and microscopic ways. Macroscopic observation was done to collect data of cerebellum's weight and young mus musculus' weight. Microscopic observation was done through histological examination of sagittal cuts with 10-micron density from the research objects. Results of the observation covered the Cerebellum's weight, Purkinje Cerebellum cell bodies' and dendrites' diameters, the number of Sulcus Gyrus Cerebellum, the percentage of Purkinje Cerebellum cells' damage level and the number of Purkinje Cerebellum cells.

The findings of the research with LSD 0.05 showed that, (1)the Cerebellum's weight of BB and BBA=0.00(ns), BB and TBBA=0.05(s), BB and Control=0.05(s), BBA and Control=0.04(s), TBBA and Control=0.01(ns), BBA and TBBA=0.05(s); (2)the Purkinje Cerebellum cell bodies' diameters of BB and BBA=0.28(ns), BB and TBBA=0.75(s), BB and Control=0.67(s), BBA and Control=0.38(s), TBBA and Control=0.08(ns), BBA and TBBA=0.47(s); (3)the Purkinje Cerebellum cell dendrites' diameters of BB and BBA=0.10(ns), BB and TBBA=0.30(s), BB and Control=0.26(s), BBA and Control=0.16(ns), TBBA and Control=0.03(ns), BBA and TBBA=0.19(s); (4)the number of Sulcus Gyrus of BB and BBA=4.75(s), BB and TBBA=8.75(s), BB and Control=8.50(s), BBA and Control=3.75(s), TBBA and Control=0.25(ns), BBA and TBBA=4.00(s); (5)the percentage of Purkinje Cerebellum cell cores' damage level from Mann-Whitney test of BB and BBA  $p=0.48$ (ns), BB and TBBA=0.00(s), BB and Control  $p=0.00$ (s), BBA and Control  $p=0.00$ (s), TBBA and Control  $p=0.17$ (ns), BBA and TBBA  $p=0.00$ (s); and (6)the number of Purkinje Cerebellum cells of BB and BBA=42.67(s), BB and TBBA=133.92(s), BB and Control=131.67(s), BBA and Control=89.00(s), TBBA and Control=2.25(ns), BBA and TBBA=91.25(s).

In conclusion, (1)the increase of Cerebellum's weight physiologically on the young mus musculus was affected by the free movement motor stimulus variation (BB); (2)the free movement motor stimulus variation (BB) affected on the increase of Purkinje Cerebellum cells' body diameters physiologically; (3)the increase of Purkinje Cerebellum cells' dendrites diameters physiologically was affected by free movement motor stimulus variation (BB); (4)the free movement motor stimulus variation (BB) affected the increase of the number Sulcus Gyrus Cerebellum physiologically; (5)the percentage of Purkinje Cerebellum cells' cores damage level in the free movement motor stimulus variation (BB) was  $< 5\%$ ; (6)the free movement motor stimulus variation (BB) gave a significant effect on the increase of number of Purkinje Cerebellum cells physiologically.

**Keywords:** Morphological response, Purkinje cells, Motor stimulus variations