

**Abstract**

**Mechanism of Blood Vessel Endothelium Repairment of Wistar Murine (*Rattus norvegicus*) Atherosclerosis Model on the Administration of Physical Exercise And Allogeneous Stem Cell**

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**Objectives:** This research is aimed to well recognize the effect mechanisms of measured and regular physical exercise administration while given the *mesencymal stem cell* by intravene to the progress of heart blood vessel endothelium to atherosclerosis.

**Material and Methods:** This research is a *true experiment* research using *post test only control group design*. Sample of this research is male white murine (*Rattus norvegicus*) of Wistar strain in the number of 24 murine controlled homogenously under the inclusion criteria, which is atherosclerosis, aged 20 weeks, weighed 180-200 grams, inhybrid, and healthy condition characterized by good appetite and normal behavior. *Rattus Norvegicus* conforming inclusion criteria was divided into four groups, those were a group of control, a group of measured and regular physical exercise of moderate intensity treatment, a group of measured and regular physical exercise of moderate intensity treatment with the administration of *mesenchymal stem cell*, and a group of *mesenchymal stem cell* administration without moderate intensity physical exercise.

**Results:** Result of manova test was obtained and demonstrated that significant result was on IL-6 ( $p < 0,001$ ), VEGF ( $p < 0,001$ ), CXCR 4 ( $p < 0,001$ ), SDF-1 ( $p < 0,001$ ). This defined an expression difference of IL-6, VEGF, CXCR 4, and SDF-1 amongst the treatment groups. Insignificant result was on SOD ( $p = 0,058$ ) which elucidated that SOD expression difference was not found on the treatment groups. In a pathway analysis, repairing mechanism by two pathways, there are administrations of moderate intensity physical exercise and exogenous *mesenchymal stem cell*.

**Conclusion:** The attempts of lowering atherosclerosis risk factor is one of protecting blood vessel endothelium ways. Interpretation of this mechanism is expected to open new perspectives of atherosclerosis prevention and medication.

**Keyword** : *atherosclerosis, exercise, stem cell*