Roles of microRNAs in Th17 and Treg in post stroke pulmonary infection

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Abstract

Background: Th17 plays an important role in promoting the inflammatory response in the body, while Treg cells have the function of inhibiting excessive inflammation. Therefore, Th17/Treg ratio plays an important part in regulating the inflammatory response. Th17 and Treg are all differentiated from the naive CD4+T cells, which is mainly in the spleen. In the case of stroke, when infected, the Th17/Treg ratio increases, but the body's immunity is reduced. Studies have shown that there is a specific expression of microRNA in the subsets of T cells. We speculate that those microRNA specifically expressed in Th17 and Treg are maintaining their polarity and their characteristic cell function.

Objective: We aimed to study the expression of specific expression of microRNA in Th17 and Treg in the case of post stroke pulmonary infection. The effects of these microRNA on the differentiation, function and plasticity of Th17 and Treg were also studied.

Methods: The right MCO rats were injected Pseudomonas aeruginosa bacterial suspension into the trachea after 24h (the experimental group) and in the control group, the right external carotid artery was separated and ligated, but the thrombus line was not inserted. The bacterial suspension was injected into the trachea 24h after operation also. After 24h, the two groups of animals were sacrificed and the spleen was taken out. The naive CD4+T cell were isolated by flow cytometry. The expression level of these characteristic microRNA was detected.

In vitro experiments, the inhibitors and activators of differential expression of microRNA in Th17 and Treg were applied to Th17 and Treg, respectively. Then, firstly, we use antigen to stimulate the two subsets and measured the cell function by detecting their specific cytokine. Secondly, Treg was cultured under Th17 polarization condition, Th17 was cultured under Treg polarization condition and the proportion of two cells and their specific cytokine were detected by 3 days after.

Results: Some characteristic microRNA in the two subsets expressed differently (miR-519-3P, miR-559, miR-129-3p, miR-542-3p and miR-548). These microRNA affected the level of differentiation (miR-519-3P, miR-559 and miR-129-3p), cell function and plasticity of Th17(miR-519-3P) and Treg(miR-129-3p, miR-542-3p and miR-548), respectively.

Conclusion: In the presence of stroke, the difference in expression of some microRNA can change differently, function and plasticity of Th17 and Treg and then influence the immune function when pulmonary infection.

Keywords—*microRNA, Th17, Treg, post stroke pulmonary infection*

Professional Biography

Zhengtian Gu, male, 37 years old, has got his bachelor’s degree in the school of medicine, Huazhong University of science and technology and master’s degree in the school of medicine, Jiangsu University and worked in Neurology department as a physician for 8 years. Now he is further pursuing his PhD study in Southeast University, and doing the basic research work in the field of immunity after stroke. He has published more than 5 papers in reputed journals.



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