

Report of "Research Award of Oral Sciences"

Major: Oral Sciences

Grade: 3rd grade

Department: Orthodontics and dentofacial orthopedics

Name: LIU YAO

Title: Conditioned Medium from the Stem Cells of Human Exfoliated Deciduous Teeth Ameliorates Neuropathic Pain in Partial Sciatic Nerve Ligation Models

1. Aim of research and results obtained

The aim of the research is to find how SHED-CM ameliorates neuropathic pain. In our experiments, we use partial sciatic nerve ligation model to induce neuropathic pain. Approximately 1/3 to 1/2 of the sciatic nerve was tightly ligated and after that we immediately injected SHED-CM or DMEM. We found after SHED-CM injection, in behavioral test data, there is significant difference between non-treatment group and SHED-CM treatment group, SHED-CM treatment greatly improved PSL-induced hypersensitivity. More macrophage 2 were found in the injured side of sciatic nerve compared to DMEM injection. Corresponding to this result, we also found more macrophage 2 accumulated in ipsilateral dorsal root ganglion in SHED-CM group as well as microglia disappeared in the ipsilateral dorsal horn. To investigate the role of macrophage 2 induced by SHED-CM injection in neuropathic pain, we performed macrophage 2 depletion. Notably, the hypersensitivity was rekindled and microglia reactivated after macrophage 2 depletion. Taken together, our data suggest that SHED-CM produced a powerful anti-nociceptive effect by inducing anti-inflammatory M2 macrophages and may be a suitable therapeutic candidate for neuropathic pain. However, detailed mechanism needs to be investigated.

2. Self-evaluation of research achievement:

Now we already got the results from sciatic nerve, dorsal root ganglion and spinal cord, but we haven't investigated the detailed mechanism how SHED-CM ameliorates

neuropathic pain, where SHED-CM has function on and which factors play the crucial role in pain amelioration. More experiments are necessary to investigate the detailed mechanisms.

3. Meeting presentation:

2020.08: The 43rd Annual Meeting of the Japan Neuroscience Society.

Place: <<Conditioned Medium from the Stem Cells of Human Exfoliated Deciduous Teeth Ameliorates Neuropathic pain in Mouse Partial Sciatic Nerve Ligation Models>>

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In preparation. Speaker: **Yao Liu**

4. Journal publication:

None