# Trehalose effect in patients with Alzheimer's disease: focus on circulating microRNAs assessed by direct hybridization

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Trehalose is a non-reducing disaccharide constituted by two glucose molecules, and it is considered novel food. It is present naturally in some plants, microorganisms, and insects now included in human nutrition. It is worth noting that trehalose is not present in mammals. Recently, it has been suggested to delay the neurodegeneration process in Alzheimer's disease (AD), in which there is no cure at the moment. Trehalose could explicate its protective roles against the development of this chronic disease by modulating epigenetic molecules such as microRNAs. Herein, twenty AD patients were randomly assigned to two groups: one received 15 g per week of intravenous trehalose for 12 weeks, and a placebo receiving saline. The study was registered in the Iranian Registry of Clinical Trials (Code: IRCT20130829014521N15). Blood samples were obtained at the beginning and end of the treatment. Circulating microRNAs were assessed with the ncounter flex platform and differentially expressed to trehalose-treated group were identified: hsa-miR-1268a, hsa-miR-3605-3p, hsa-miR-555, and hsa-miR-6511a-3p were significantly downregulated, while hsa-miR-324-3p and hsa-miR-539-5p showed significant upregulation. Their gene targets were determined through bioinformatics approaches, revealing that trehalose treatment impacts critical AD-related pathways and proteins.

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