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## Effects of Aqueous Extract of *Trachyspermum copticum* L. link Seeds on TGF-beta Receptor 1 and 2 Genes Transcription in MCF-7 Cell Line

**Presenter Author:** Marzieh Alikhani  
**Email:** marziehalikhani@sbm.ac.ir

**Corresponding Author:** Forouzan Karimi

Marzieh Alikhani<sup>1</sup>, Forouzan Karimi<sup>2</sup>, Hassan Darbandi-Tamijani<sup>3</sup>, Shima Rasouli<sup>4</sup>, Sarira Shahnava<sup>5</sup>, Mohammad Kamalinejad<sup>6</sup>, Ahad Khalilnejad<sup>7</sup>, Mohammad-Reza Sohrabi<sup>8</sup>

1. Department of Immunology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
2. Department of Immunology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
3. Department of Immunology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
4. Department of Immunology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
5. Department of Immunology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
6. Department of Pharmacognosy, School of Pharmacy, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
7. Department of Immunology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
8. Department of Community Medicine, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

**Background and Aim :** TGF-beta 2 signaling pathways exert a pivotal role in behavior and fate of tumor cells. Therefore, these pathways are target of drug discovery researches. In our previous studies, treatment of MCF-7 cell lines with aqueous extract of *Trachyspermum copticum* L. link seeds, in a time and dose dependent manner, associated with change in TGF-beta 2, Smad2, and Smad4 gene expression at the level of transcription. In this complementary study, regarding the importance of TGF-beta in TGF-beta 2 signaling pathway, we evaluated the effects of this extract on TGF-beta receptor (TGF-beta R 1 and 2) genes coding the heterodimer complex of receptor in MCF-7 cell line of human breast cancer. **Methods :** Non-cytotoxic concentrations of the extract determined by MTT test. MCF-7 cell line treated with non-cytotoxic concentrations (5 and 40 µg/mL) of extract for 24 hours. Then, Real-Time PCR was performed for evaluating the expression of TGF-beta Receptors 1 and 2 genes at the level of transcription, comparing the control groups. Data were analyzed using REST® software and Analysis of Variance. Level of significance was set at 0.05. **Results :** Treatment of cells with the extract showed meaningful changes in TGF-beta R1 at the level of transcription ( $p < 0.05$ ); so that in cells treated with concentration of 5 µg/mL of extract gene transcription reduced to almost half (0.52) and in those treated with concentration of 40 µg/mL of extract, gene transcription increased to 1.34 times comparing to control group. Treatment of cells with extract showed no meaningful changes in TGF-beta R2 gene expression at the level of transcription ( $p = 0.148$ ). **Conclusion :** Results suggest that treatment of MCF-7 cells with aqueous extract of *Trachyspermum Copticum* (L.) Link seeds in a dose dependent manner can affect the TGF-beta Receptor 1 gene transcription, but not the TGF-beta Receptor 2. This can affect the microenvironment of tumor cell. Although further studies, including investigation of simultaneous expression of genes and proteins of TGF-beta Receptor chains are required to provide evidences of the effectiveness of *Trachyspermum Copticum* (L.) Link seeds on tumor cells. **Keywords :** *Trachyspermum copticum* (L.) Link; Zenian; Anticancer; Aqueous Extract; Human Breast Cancer Cell Line (MCF7);, Gene Expression; Gene Transcription; Transforming Growth Factor-beta Receptor 1 (TGF-beta R)

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