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The Effect of Curcumin on CD155 Gene Expression in Colorectal Carcinoma

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Abstract:colorectal carcinoma (CRC) is one of medical and/or surgical challenge that affect older age persons. One of predominant tumor marker is over expression of CD155 gene. Curcumin in nowadays employed for a variety of human diseases. **Aim of study:** to demonstrate if curcumin has anti-cancer effect on colorectal carcinoma (detected by reduction of CD155 gene expression) or not. **Materials and method:** CL40 cell line was prepared in 96 tissue culture plate, the level of CD155 gene was estimated by using RT-PCR before and after treating CL40 cell with 2 µg/ml solution of curcumin. **Results:** there was significant reduction of CD155 gene expression after treatment with curcumin. **Conclusion:** curcumin has a potential targeting cytotoxic effect on colorectal carcinoma cells.

Keyword: Colorectal carcinoma, CD155 gene, Curcumin, RT-PCR.

Introduction:since (CRC) regarded as one of the most common tumor in human beings (4th common type), many researches has been focused on satisfactory alternative medicinal approach to minimize the burden of this malignancy (Center, Jemal et al. 2009). One of molecular marker of CRC is over expression of CD155 gene that has high relationship to malignancy-potential and crucial effect in metastasis and neo-vascularization of new tumor cells (Masson, Jarry et al. 2001).

Many studies has been focused on the role of plant extract in treatment or palliation of human malignancy(Al-Yasiry, Abood et al.). One of these substances that currently is ongoing thoroughly investigated is Curcumin (Al-Yasiri, Awad et al. 2017). Due to curcumins' cytotoxic effect on variable tumors with less side effect than chemical drugs , this makes it a potential safe hope for reduction the influence of these tumors include CRC (Al-Yasiri, Awad et al. 2017). According to many studies, it was shown that the least cytotoxic concentrationofcurcumin on variable tumor cell in vitro (cell line studies) is about 2 µg/ml (Jia, Zhang et al. 2014).

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Materials and method:CL40 cell lines is used as experimental model for this study on (CRC). A 96 tissue culture plate was prepared seeded with at least $1X10^4$CL40 cells for each sample. Curcumin was prepared in laboratory at concentration of 2 µg/ml and was added to 80 samples while 80 samples were untreated and used as a control group. Real time PCR (RT-PCR) was used to estimate the level of CD155 gene expression in both treated and control group by comparing of the significance of PCR-cycle threshold(Jawad and AR 2020) (CT value is inversely associated with level of gene expression) using the following primers:

Forward5'-TATCTGGCTCCGAGTGCTTGCC-3' primer; and reverse 5'-ATCATAGCCAGAGATGGATACC-3' primer.The RT-PCR protocol involve the following steps:a) initial single cycle of denaturation for 5 min. at95C^o, (b) with subsequent annealing at 58 C^o for 40 sec,c) extension step at 72 C^o for 40 sec, (d) with finalholding the specimen at 8 C^o.

Results and discussion:statistical analysis by using paired *t-test* was used. It was demonstrated that curcumin has very significant role in reduction of CD155 gene expression at P value < 0.001 as showed in table (1).

Table (1): the CT value of CD155 gene (expressed as Mean±SD) estimated by real timePCR.

Group Name	No. of samples	Mean±SD	P value
Treated CRCcells	30	14.680±1.95*	0.001
Untreated CRC cells	30	41.325±5.214	
* means significant at given p value			

The characteristic role of curcumin as a cytotoxic agent against CRC cell was linked to its effect on NF-κB, STAT3, activated protein-1 (AP-1), epidermal growth response-1 (Egr-1), and p53, a crucial signaling factors in cancer development and progression(Wong, Ngai et al. 2019). The high affinity of curcumin to reduce CD155 gene expression may be related to the capability of curcumin to highly binding the trans-membrane lipophilic gene receptor that is eventually suppress intracellular machine to promote gene over-expression(Gromeier, Solecki et al. 2000).

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