

# New advances and ideas of TCM combined with stem cells in the treatment of tumor

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**Abstract:** in recent years, tumor stem cells should be used as the entry point in the clinical treatment of tumor, and based on the targeted regulation of tumor stem cells to treat tumor. In addition, traditional Chinese medicine also plays an effective role in the treatment of tumors. Based on this, this paper focuses on the new progress of TCM combined with stem cells in the treatment of tumors.

**Keywords:** traditional Chinese medicine; Stem cells; Tumor; Progress; Train of thought

**Publication date:** June, 2019

**Publication online:** 30 June, 2019

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Over the years, anti-tumor research has always been guided by directly kill tumor cells of anti-tumor drugs research strategy is gradually began to change, the theory of cancer stem cells, and it has been separated from a wide variety of tumor cancer stem cells, which provides a new idea for the study and treatment of tumor, at the same time, traditional Chinese medicine (TCM) in the direction which is intervention in cancer stem cells.<sup>[1]</sup>This paper reviews the recent advances in the study of traditional Chinese medicine in tumor stem cells in order to provide a new direction and strategic reference for the study of TCM combined with stem cells in the treatment of tumor cells.

## 1 research on the intervention of traditional Chinese medicine on various tumor stem cells

### 1.1 Leukemia stem cells

TCM theory holds that the occurrence and development of tumors are caused by deficiency of vital energy,

imbalance of Yin and Yang, and aggregation of toxic and evil, that is, the process of “positive, negative and evil”. Tian fierce and righting thrift Chinese medicine on 32 cases of leukemia patients not clear pith in haploid hematopoietic stem cell transplantation, the results of the traditional Chinese medicine treatment group compared with control group, the Chinese medicine treatment group the incidence of severe GVHD is lower than the control group, showed that the centralizer thrift Chinese medicine treatment can reduce the occurrence of severe GVHD, improve patients after transplantation immune status.<sup>[2]</sup>TengWenJing etc from “promoting blood circulation to remove blood stasis” class of traditional Chinese medicine “dispelling blood stasis” and “new blood”, respectively, in conformity with the stem cells in the circulation process and the result of stem cell cycle characteristics, by promoting blood circulation to remove blood stasis type of traditional Chinese medicine to investigate bone marrow hematopoietic stem cells “niche” CXCR4 a balance with chronic granulocyte white blood CXCL12 axis, the study found that CXCR4 / CXCL12 axis in the stem cell niche in chronic myelogenous leukemia may has the special biological mechanism, and further discuss the hematopoietic I - cell biology behavior level, the influence of the find new breakthrough for CML pathogenesis research.<sup>[3-4]</sup>Finally, it was proved that “activating blood and removing blood stasis” could not only interfere with the proliferation and differentiation of bone marrow hematopoietic stem cells, but also affect the circulation of stem cells.

### 1.2 Research on solid tumor stem cells

#### 1.2.1 human breast cancer stem cells

Mammary gland tumour is one of common tumour, "yellow emperor nei jing · plain ask" the yue says: "healthy gas remains inside, evil cannot dry". Through

experimental research, jin yu et al. found that fuzheng xiaoma can significantly inhibit the proliferation of human breast tumor McF-7 cells in vitro, and induce their apoptosis, so as to achieve the purpose of anti-tumor.<sup>[5]</sup>Chen xiquan et al. reported that the serum containing drugs of traditional Chinese medicine fuzheng quyu had different inhibitory effects on the proliferation of breast cancer stem cells mda-mb-231, which may inhibit the proliferation and apoptosis of tumor cells by regulating the expression of mir-34a target gene SIRT1.<sup>[6]</sup>

### 1.2.2 human brain tumor stem cells

Brain tumor stem cells have the characteristics of proliferation, self-renewal and multidirectional differentiation, and they account for a very low proportion of tumor tissues, but they are the key to the malignant characteristics of tumors. Ting-ting, etc in the twilight, dong ling grass and spreading hedyotis herb of joint compound extract more yesterday of human cytomegalovirus (HCMV) respectively.there positive study, brain tumor stem cells transplantation tumor found compound Chinese herbal extract and ever more inhibition of glioma PCLS respectively.there - 2 mRNA expression differences significant main effect, show that compound Chinese herbal medicine extracts joint more yesterday for HCMV, respectively.there malignant glioma growth inhibition.<sup>[7]</sup>Liu jianmin et al. studied the effects of huoxue huayu decoction on the invasion ability of C6 brain tumor stem cells (BTSCs) and the expression of TIMP1 mRNA. The study confirmed that huoxue siwu decoction, xuefuzhuyu decoction and yuedang decoction can promote the expression of TIMP1 mRNA, enhance the inhibitory effect of matrix metalloproteinase, and thus inhibit the invasion ability of C6 BTSCs.<sup>[8]</sup>

## 2 Research progress of traditional Chinese medicine

Traditional Chinese medicine is the crystallization of the traditional culture and wisdom of the Chinese nation. Liu yunxia et al. reported that yiqi and kidney-tonifying prescription had a significant effect on anti-proliferation and metastasis of gastric tumor cells, and the mechanism was to down-regulate the expression of CD24, CD44 and EpCAM, the surface markers of gastric tumor CSC, induce benign differentiation of gastric tumor CSC, and reduce the proportion of CSC in the tumor body to achieve the effect.<sup>[9]</sup>Fu Yang et

al. observed that the effective components of lichong shengmai decoction could affect the characteristics of ovarian tumor stem cells and cisplatin sensitivity, and reverse the resistance of ovarian tumors to cisplatin mainly by down-regulating the expression level of ABCC1 and its mRNA and reducing the drug outflow.<sup>[10]</sup>Yang peiying et al. concluded that traditional Chinese medicine (single medicine and compound traditional Chinese medicine) can help to strengthen the body, reduce toxicity and increase efficacy, prolong survival time and improve the quality of life, and has a good effect in the prevention and treatment of toxic side effects caused by chemotherapy of malignant tumors.<sup>[11]</sup>According to a large number of research results, traditional Chinese medicine has provided us with new approaches and ideas for the study of cancer due to its overall concept of syndrome differentiation, the research method of constitutive theory, the treatment mode of discriminative theory and the advantages of low toxicity and no drug resistance peculiar to natural drugs.<sup>[12]</sup>

## 3 Conclusion

In summary, a large number of experimental studies have shown that the tumor is caused by a small number of stem cells with gene mutations. Among them, traditional Chinese medicine treatment is a common method of tumor treatment in China. After long-term clinical practice, combined with radiotherapy and chemotherapy, tumor metastasis or recurrence can be avoided after surgery. Therefore, it is necessary to combine traditional Chinese medicine with stem cells to treat tumors.

In recent years, the in-depth understanding of tumor biology has made people gradually realize that directly killing tumor cells is not a "unipolar" effective strategy for treating tumors. Studies on tumor immunity, tumor stem cells, autophagy and EMT have provided a "multi-polarization" direction for the development of anti-tumor drugs. Traditional Chinese medicine treats diseases with the guidance of regulating the balance of Yin and Yang. This is also the evidence for the fact that most of the anti-tumor traditional Chinese medicine ingredients have very weak effect on killing tumor cells in vitro. The multi-component and multi-target characteristics of traditional Chinese medicine determine that its anti-tumor effect and mechanism will be reflected in all aspects of tumor biology. Therefore, the evaluation of the anti-tumor effect of traditional

Chinese medicine and the explanation of the mechanism, based on the development of new drugs of traditional Chinese medicine need to combine with the progress of tumor biology to adopt a variety of strategies and different methods.

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