

made great progress, but some problems still need further study, as an anti-tumor drug delivery vector, HA has targeting tumor cells, the role of the site is mainly CD44 receptor, and CD44 receptors may exist a wide range of expression, the variation itself reduces the selectivity of the target, short update cycle and easy saturation disadvantages. Therefore, to overcome these shortcomings of CD44 receptors, to improve the active targeting of tumors is the future direction of research.

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INDUCING CALLUS OF GENTIANA MANSHURICA KITAG.

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Abstract The time of surface sterilization by 10% NaClO for sprouting seeds of *Gentiana manshurica* Kitag. was evaluated. The conditions of callus inducing from the explants of hypocotyls were examined. The results indicated that the optimal time for seeds surface sterilization by NaClO is 8 min, the proportion of different concentration of hormones have the same effects on inducement of callus, and 1/2 MS medium containing 6-BA 0.5mg/L and 2,4-D 2mg/L is the optimal condition for the growth of callus of *G. manshurica* Kitag.

Keyword *Gentiana manshurica* Kitag . ; Seeds sprouting; Callus

Objection and Meanings Recently, overexploitation of wild plants has resulted in extensive cropping. The term “callus” originates from the Latin word callum, which refers to the massive growth of cells and cell masses[5]. Callus could be converted into suspension cells which are used to ferment bioactive compounds. This study can lay the foundation for establishing the asexual reproduction system and producing the bioactive secondary metabolites by large scale fermentation of suspension cells.

Materials and methods Seeds of *G. manshurica* Kitag. are kindly offered by professor Chen Wang of Harbin Normal University. Seeds of *Gentiana manshurica* Kitag. were soaked in distilled water for 48 hours and sterilized with 75% ethanol for 40s. Then the seeds were washed with sterile distilled water repeatedly. The treated seeds were surface sterilized by using 10% of NaClO for 6min, 8min and 10min, respectively. One drop of Tween-80 was also added as surfactant. After 6, 8, 10 minutes the seeds were washed 4-5 times with sterile distilled water to remove the traces of bleach with gentle shaking under sterile conditions[1]. The seeds were incubated on MS solid medium containing no hormones at 25 °C for 16 hours with light conditions[2]. Hypocotyls were cut from aseptically germinated seedlings. Each kind of explants was cut into small segments and incubated on 1/2 MS solid medium containing different concentration hormones at 25 °C with 16 hours with light. The growth status of each group was compared. Callus in good growth status was picked, cut off the browning part and cut into 1cm segments[3,4]. The segments were incubated on MS medium containing different concentration of hormones. The growth status were compared among the groups.

Results and discussion Germination rate of the seeds with different surface sterilized time was compared (Table 1) (Figure 1). The results showed that 8 min is the best timing for seeds surface sterilizing of *Gentiana manshurica* Kitag. for sprouting. When the length of sterilization time is shorter than 8 min, there are more survival microorganisms of surface, and can result in more contaminated opportunities in later tissue culture. On the other hand, the length of sterilization time is longer than 8 min, the seeds would be damaged, and the rate of germination would decrease. Callus induced on mediums containing different concentration of hormone was compared (Figure 2). The results showed that the effect of different concentrations of hormones on callus of *Gentiana manshurica* Kitag. inducement is basically the same. The growth of subculture callus is affected by the variation of concentration of 6-BA combined with 2,4-D. When the concentration of 6-BA in medium is high the callus become partly browning, and different concentration of 6-BA with 2,4-D is important to callus growth.

Table 1 The germination rate of *Gentiana manshurica* Kitag. seeds with different sterilize time

surface sterilize time	6min	8min	10min
Germination rate	50%	87.2%	71.8%



Figure 1. germinated seedlings of *Gentiana manshurica* Kitag.



Figure 2. callus of *Gentiana manshurica* Kitag.

Conclusions The results showed that 8 min is the best timing for surface sterilization on germination of seeds of *Gentiana manshurica* Kitag. Short time of surface sterilization can not entirely kill the microorganism, and long time lasting will also hurt the seeds. Appropriate proportion of hormone contained in medium was the key factor for callus growth.

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EFFECTS OF GINSENG ON ALZHEIMER'S DISEASE IN CENTRAL NERVOUS SYSTEM

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Abstract: Alzheimer's disease (AD) is a progressive neurodegenerative disease that is the most common form of dementia in the elderly. It is characterized by a cognitive decline, usually marked by loss of potential memory, followed by overall damage to the higher cortical function. Ginseng, as a traditional Chinese medicine (TCM) has long been used to alleviate many diseases, especially diseases associated with aging and memory deterioration. Ginseng has an impact on multiple action sites and is an ideal choice for the development of multi-target drugs. Therefore, Ginseng and its active substance ginsenosides are becoming more and more popular in neurological protection. This article reviews the effects and mechanism of ginseng and ginsenosides in the central nervous system (CNS) associated with Alzheimer's disease.

Key words: Alzheimer's disease, ginseng, ginsenosides, central nervous system

Alzheimer's disease is the most typical dementia disease, accompanied by neurodegeneration¹. It is estimated that there are more than 35 million AD patients worldwide, with about 36 million expected by 2050². Ginseng is a traditional Chinese medicine which considered a magic plant that effectively treats many health problems. Ginsenosides, the active compounds of ginseng, are widely used in the pharmacological examination of ginseng. And it was increasingly accepted that ginseng and ginsenosides have some effects on central nervous system diseases. In the central nervous system diseases, one of the typical symptoms is Alzheimer's disease. And at present, ginseng and its related compounds have been widely used in the study of AD.

By referring to the relevant literatures, the pharmacological effects and mechanism of ginseng and ginsenosides in CNS have been summarized as follows:

Effects on neurite outgrowth. By screening neurite outgrowth activities of several ginseng drugs in human neuroblastoma SK-N-SH, Tohda et al. proved that ginsenoside Rb1 and its intestinal metabolite M1 restored the damaged space memory by the induction of synaptic vesicles through intraventricular injection of A β 25-35 in the AD animal model³.

Neuroprotection. Tu et al. in human neuroblastoma cells SY5Y, using cyclosporin A (CsA) inhibit calcineurin (CN) induced multiple sites of tau hyperphosphorylation, accompanied by oxidative stress. Results show that leaves of Panax ginseng (GSL) induced the increase of SOD activity and SH content. Indicating that GSL may have some effects on neuroprotection on certain features of AD⁴.

Anti-inflammatory effects. Wang et al. demonstrated the neurological and anti-inflammatory effects of gin-