

利用虎奶菇製備抗腫瘤納米硒

Preparation of Selenium Nanoparticles with Strong Anti-Tumor Activity Using Tiger Milk Mushroom

利用虎奶菇菌核多糖蛋白複合物(PSP)製備高穩定性的抗腫瘤納米硒

Preparation of highly stable selenium nanoparticles with strong anti-tumor activity using polysaccharide-protein complexes (PSP) isolated from mushroom sclerotia of *Pleurotus tuber-regium*

專利申請編號及國家：201110208539.2(中國)

特色與優點

- 是首次有科學家利用菇類PSP來做穩定劑，製備高穩定性的抗腫瘤SeNPs
- 此新穎的SeNPs是在一個簡單的“食品級”氧化還原體系中製備出來
- 此新穎的SeNPs具有高穩定性、大小可控和可溶水等特質

應用

1. 菇類PSP：
 - 可穩定SeNPs的新功能食品配料
→ 促進食用菇栽培產業之發展
2. SeNPs：
 - 新型癌症化學預防藥物 / 保健食品
→ 促進藥品及保健食品工業之發展
→ 提升公共健康水準及減輕政府的醫療開支

獎項

- 第40屆日內瓦國際發明展 - 金獎 (2012年4月)
- 中國代表團獎 (2012年4月)
- 2011國際食品保健因子大會-青年科學家獎 (2011年11月)

「硒」是一種人體健康必需的微量元素。由於納米硒(SeNPs)具有生物可用度高、毒性低及抗腫瘤活性強等特質，因而成為新的研究熱點。然而，納米粒子本身極易聚集，若聚合體一旦超過了納米尺度，其抗腫瘤活性就會大大降低。利用虎奶菇菌核提取的多糖蛋白複合物，我們成功在一個簡單的“食品級”氧化還原體系中製備出高穩定性的SeNPs。初步研究發現這穩定化SeNPs能高效地誘導乳腺癌細胞凋亡，但對正常細胞幾乎沒有細胞毒性。



虎奶菇菌絲體、菌核及子實體的培養
Cultivation of mycelium, sclerotium & fruiting body of *Pleurotus tuber-regium*

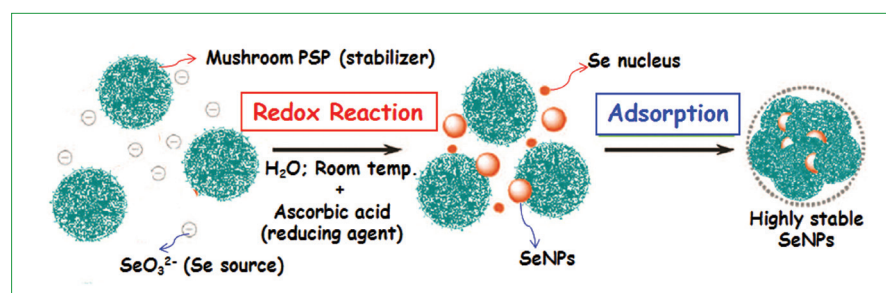


2011國際食品保健因子大會-青年科學家獎
Young Investigator Award - 2011 International Conference on Food Factors



第40屆日內瓦國際發明展-中國代表團獎
Prize of the Chinese Delegation of the Exhibition, 40th International Exhibition of Inventions of Geneva, Switzerland

Recently, selenium nanoparticles (SeNPs) have become a new research target, since they were found to possess excellent bioavailability, low toxicity and remarkable anti-tumor activity. Nevertheless, SeNPs aggregate easily and their anti-tumor activity will be significantly reduced, once their nano-size could not be maintained. By using the PSP isolated from mushroom sclerotia of *Pleurotus tuber-regium*, highly stable SeNPs were successfully prepared under a simple food-grade redox system. Besides, these novel SeNPs were found to remarkably inhibit the growth of human breast carcinoma MCF-7 cells by apoptosis induction in a dose-dependent manner, but were non-cytotoxic toward the normal cells.



於一個簡單的“食品級”氧化還原體系中製備高穩定性SeNPs
Preparation of highly stable SeNPs under a simple food-grade, environmental friendly redox system

Patent Application No.: 201110208539.2 (China)

Special Features and Advantages

- This nanotechnology is the first of its kind to prepare highly stable SeNPs with strong anti-tumor activity using mushroom PSP as stabilizer
- The novel SeNPs are prepared under a simple food-grade redox system
- The novel SeNPs are highly stable, size-controllable and water-dispersible

Applications

1. Mushroom PSP:
 - brand new functional food ingredients for stabilizing SeNPs
→ facilitate the development of mushroom cultivation industry
2. SeNPs:
 - novel cancer chemopreventive agents/health food products
→ facilitate the development of both drug and health food industries
→ promote public health & alleviate government's medical expenses

Awards

- Gold Medal - 40th International Exhibition of Inventions of Geneva, Switzerland (April 2012)
- Prize of the Chinese Delegation of the Exhibition, 40th International Exhibition of Inventions of Geneva, Switzerland (April 2012)
- Young Investigator Award - 2011 International Conference on Food Factors (November 2011)

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