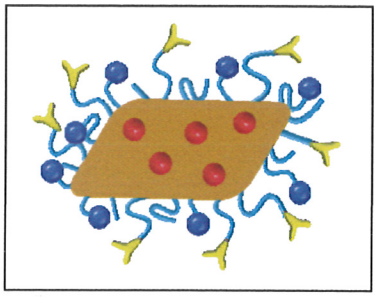
經修飾的奈米矽片以及經修飾的奈米矽片用於製備治療癌症藥



提案人： 張志豪 副教授
單　位： 國立臺灣大學　醫學系骨科部
簡　歷： 張志豪副教授於 1993 年畢業於台大醫學系，1994 年起擔任台灣大學附設醫院骨科部住院醫師、總住院醫師及主治醫師。2003 年前往美國加州大學聖地牙哥分校醫工研究所任研究員，2010 年取得台灣大學醫學工程學研究所博士學位。專長於手足外科、肩肘關節手術、抗菌材料、醫材表面處理及 3D 列印骨科研究。張志豪副教授曾任台灣手外科醫學會第十三屆理事長、宜蘭羅東博愛醫院骨科部主任等，現為國立台灣大學醫學院附設醫院骨科部主治醫師及手足外科主任、國立台灣大學醫學院骨科專任副教授、台灣手外科醫學會理事長、醫療器材創新發展協會理事長。

市場及需求:

近期在奈米尺度的載體(nanoscale vectors)或奈米載體等方面的進展包括：結構經設計的脂質體(liposome)、微膠粒(micelle)、樹枝狀聚合物(dendrimer)、聚合物(polymer)、量子點(quantum dots)、碳奈米管(carbon nanotubes)、金屬奈米顆粒，如氧化鐵，金奈米顆粒以及中孔二氧化矽(mesoporous silica)的應用。這些奈米載體的生物相容性(biocompatibility)係為另一個重要的課題。藥物專一性遞送的機制係為設計活性標靶基團(active targeting moieties)，使其結合或辨識細胞表面的受體，該活性標靶基團例如：抗體(antibodies)、脂蛋白(lipoproteins)、激素(hormones)、帶電位點(charged sites)以及核酸(nucleic acids)。

技術摘要(含成果):

本發明係提供一種經修飾的奈米矽片，包含：奈米矽片；連接元，其係共價鍵結至該奈米矽片；以及有機基團(organic moieties)，其係一有機分子連繫(tethering)至該連接元所形成。本發明提供一種經修飾的奈米矽片用於製備治療癌症藥物之用途，其中經葉酸 (folic acid)及螢光異硫氰酸鹽 (FITC)修飾的奈米矽片係用於作為藥物之載體。

優勢:

1. 經修飾的奈米矽片的細胞毒性係可控制在合理的範圍之內，並且可有效標靶腫瘤細胞。
2. 經修飾的奈米矽片，其中該有機分子係選自由腫瘤細胞標靶物質(cancer-cell targeting agents)及螢光分子(florescence molecules)所組成。

競爭產品:

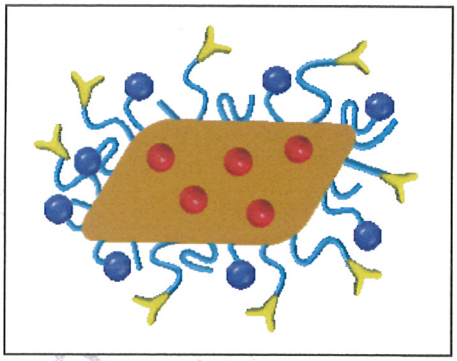
專利現況:

聯絡方式(請不用填):

臺大產學合作總中心
Tel: 02-3366-9945,　E-mail: ntuciac@ntu.edu.tw

The modification of Nano Silicate Platelet and its application for drug delivery against cancer

PI： Assoc. Prof. Chih-Hao Chang
Department of Orthopedic Surgery, National Taiwan University



Experience:

Professor Chih-Hao Chang is currently the Associate Professor in National Taiwan University. He was the Managing Director of Taiwan Society for Surgery of the Hand (TSSH). He was engaged in teaching, research and clinical work for over twenty years. He received his PhD in Biomedical Engineering Institute in 2010 from National Taiwan University. In addition to his university and hospital work, Professor Chang is energetic in research relating to antibacterial material, surface treatment of medical device and 3D-printed orthopedics device.

Market Needs:

Recent progress of nanoscale vector was involved in structural design of liposome, micelle, dendrimer, polymer, quantum dots, carbon nanotubes, metal nanoparticles (Au or Fe_3O_4), mesoporous silica and their applications. The biocompatibility of nanoscale vector is another major concern. Drug delivery could be accomplished by active targeting moieties (such as antibodies, lipoproteins, hormones, charged sites and nucleic acids) binding and recognizing cell receptors specifically.

Our Technology:

A modified Nano Silicate Platelet (NSP) was developed. The modified NSP was composed of a NSP; linkers, which were bound to NSP covalently; organic moieties, which were tethered on linkers. In this invention, the folic acid and FITC served as organic moieties on NSP and the modified NSP were provided as a potential drug delivery carrier against cancer.

Strength:

1. The cytotoxicity of modified NSP was in a safety range and the targeting tumor cells efficiently were achieved.
2. Multi-functions were achieved by the dual tethering of cancer-cell targeting agents and florescence molecules onto the same NSP units.

Competing Products:

Intellectual Properties:

Contact (do not need to fill out):

Center for Industry-Academia Cooperation, NTU
Tel: 02-3366-9945, E-mail: ntuciac@ntu.edu.tw