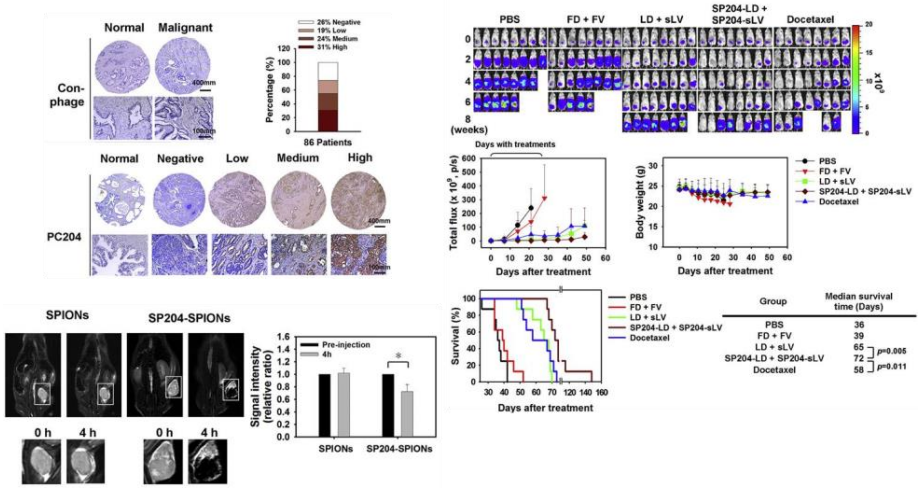
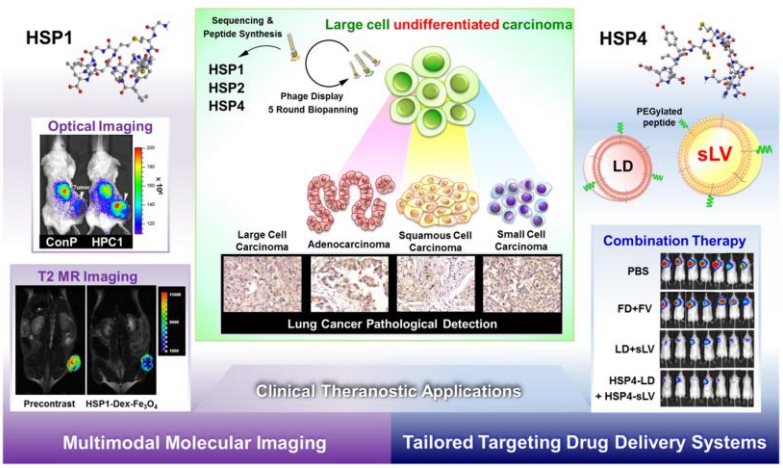
研發標靶藥物傳輸系統運用於癌症之影像分子及治療

主要領域　癌症治療

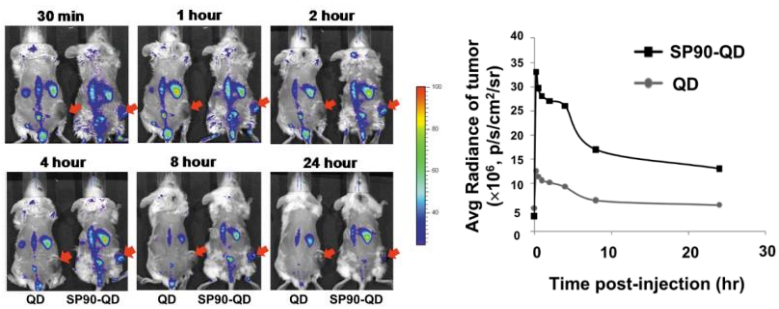
一. **癌症標靶胜肽對於前列腺癌的診斷和治療**/從前列腺癌細胞和前列腺癌患者的手術樣本已成功地辨認出特定胜肽標靶。標靶胜肽的接合使得顯像劑能更精確地遞送至腫瘤部位。此外，在小鼠異種移植和正交模型中發現脂質體doxorubicin和vinorelbine接合標靶胜肽的給藥顯著地增加對人類前列腺腫瘤生長的抑制。這些結果表明標靶胜肽,SP204,對於前列腺癌的標靶治療和分子影像方面具有重大潛力 (Biomaterials, 2016)。全球專利申請中。



二. **肺癌特定胜肽配體對於標靶藥物傳輸和影像診斷**/肺癌是全世界癌症相關死亡的主要原因之一。三種標靶噬菌體(HPC1、HPC2 和 HPC4）及其各自的展示胜肽（HSP1、HSP2 和 HSP4）能夠與 SCLC 和 NSCLC 細胞株以及臨床樣本結合，但不能與正常的肺炎組織結合。在NSCLC動物模型中，脂質體doxorubicin接合HSP1、HSP2 或 HSP4明顯地有更好的治療效果，優於無標靶脂質體藥物。在動物體內噬菌體制導的光學影像和胜肽-SPIONs的磁共振影像顯示HSP1是肺癌多模式分子影像中最有利的探針 (Theranostics 2017)。全球專利申請中。



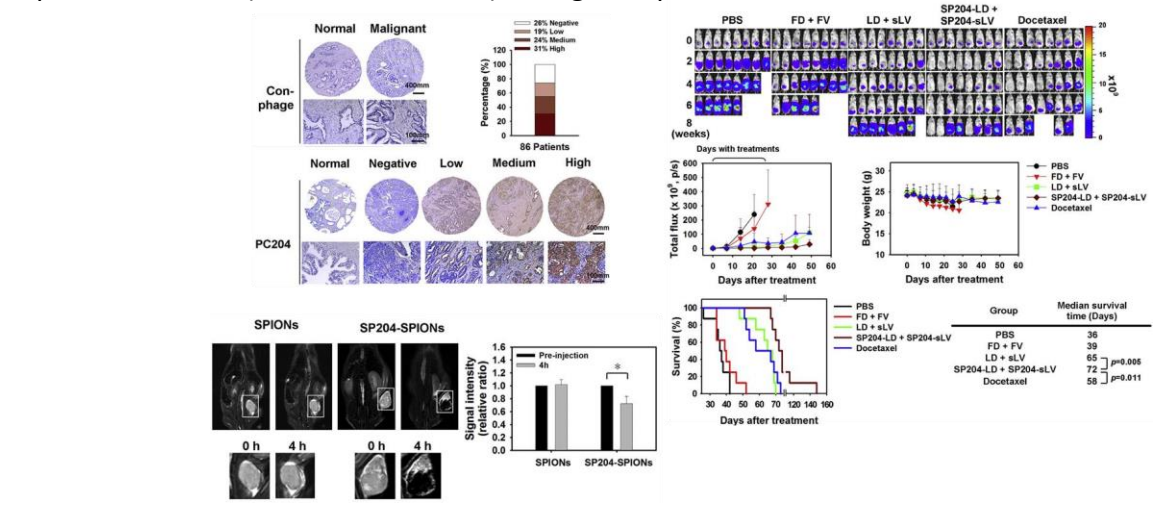
三. **癌症標靶胜肽對於乳癌的治療**/在此研究中，我們利用噬菌體展示鑑定了一種新的標靶胜肽SP90，它可以特異地結合乳癌細胞，並從乳癌患者上識別出腫瘤組織。在腫瘤異種移植和正交模型中，SP90 接合的脂質體doxorubicin被發現可藉由選擇性地增加在腫瘤中的積累來改善化療藥物的治療指數 (PLOS ONE 2013)。全球專利申請中。



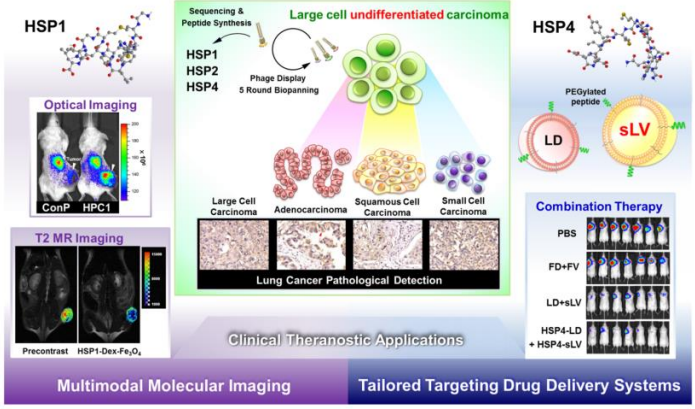
Development of Targeted Drug Delivery Systems for Cancer Molecular Imaging and Therapy

Research Area Cancer Treatment

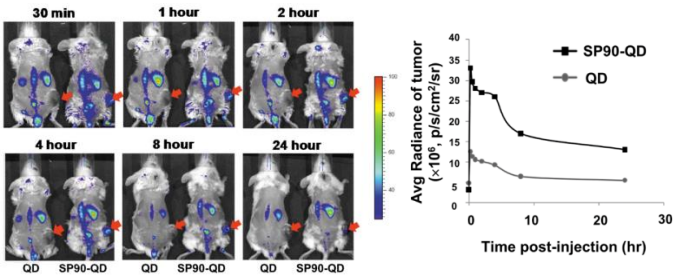
1. **Cancer targeting peptides for use in the diagnosis and treatment of prostate cancer**/ Specific peptides targeting prostate cancer cells and surgical specimens from prostate cancer patients were successfully identified. The conjugation of targeting peptide to imaging agents results in more precise delivery to tumor sites. Furthermore, administration of liposomal doxorubicin and vinorelbine conjugated with targeting peptides was found to markedly increase the inhibition of human prostate tumor growth in mouse xenograft and orthotopic models. These results indicate that targeting peptide, SP204, has significant potential for targeted therapy and molecular imaging in prostate cancer (Biomaterials 2016). The global patent has been filed.



2. **Lung cancer specific peptide ligands for targeted drug delivery and imaging diagnosis**/ Lung cancer is the leading cause of cancer-related death worldwide. Three targeting phages (HPC1, HPC2, and HPC4) and their respective displayed peptides (HSP1, HSP2, and HSP4) were able to bind to both SCLC and NSCLC cell lines, as well as clinical specimens, but not to normal pneumonic tissues. Liposomal doxorubicin conjugated to HSP1, HSP2, or HSP4 had significantly greater therapeutic efficacy than non-targeting liposomal drugs in NSCLC animal model. In vivo optical imaging of phage homing and magnetic resonance imaging of peptide-SPIONs revealed that HSP1 was the most favorable probe for multimodal molecular imaging of lung cancer (Theranostics 2017). The global patent has been filed.



3. **Cancer targeting peptides for treatment of breast cancer**/ In this study, we utilized phage display to identify a new targeting peptide, SP90, which specifically binds to breast cancer cells, and recognizes tumor tissues from breast cancer patients. In tumor xenograft and orthotropic models, SP90-conjugated liposomal doxorubicin was found to improve the therapeutic index of the chemotherapeutic drug by selectively increasing its accumulation in tumors (PLOS ONE 2013). The global patent has been filed.



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