



可三維列印血管新生藥物篩選平台

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市場及需求：

1. 組織血管再生與癌症血管新生之藥物篩選平台
2. 高通量藥物快篩平台
3. 血管細胞與其他細胞交互作用研究

技術摘要(含成果)：

利用天然生物材料將血管細胞與其他種類細胞(如幹細胞或癌細胞)組裝成 3D 細胞球體，再利用天然材料構成之水膠包覆細胞球體，直接觀察血管細胞之血管新生現象，或結合 3D 生物列印技術，將細胞球體與水膠共同列印來製成藥物快篩平台。水膠可支持血管細胞形成血管網絡，且穩定性佳，因此可長期觀察血管生長現象。

優勢：

1. 可反映活體內血管細胞與其他細胞的交互作用
2. 可反映活體內血管新生現象
3. 材料具有良好細胞相容性
4. 可 3D 列印製成高通量藥物快篩平台
5. 水膠穩定性佳可長期觀察

競爭產品：

1. Corning Matrigel matrix

專利現況：

本研究團隊對於細胞與生醫材料之交互作用有相當的了解，在國際上發表多篇利用生醫材料來製成細胞球體的研究，並對細胞於細胞球體內的特性變化做深入探討。另一方面，本團隊對於 3D 列印生物墨水的開發與生物 3D 列印技術的應用已有相當經驗，相關的列印材料、細胞培養技術與應用皆已申請專利保護。

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Printable screening platform for angiogenic drug

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Market Needs:

1. Drug screening platform for vasculogenesis and angiogenesis
2. High-throughput drug screening platform
3. Research in the interaction between vascular cells and other cells

Our Technology:

We generated the cellular co-spheroids composed of vascular cells and other cells (such as stem cells or cancer cells) by the natural materials. The formed co-spheroids were then encapsulated into the specific hydrogels, and the angiogenic phenomenon derived from co-spheroids was directly observed in the hydrogels. Combined with 3D bioprinting, the co-spheroids were directly bioprinted with hydrogels to form a high-throughput platform for drug screening. Due to the great stability of hydrogels, vascular networks can be maintained in the hydrogels for a long time.

Strength:

1. Crosstalk of vascular cells and other cells *in vivo* can be simulated.
2. Angiogenic phenomenon can be simulated.
3. Good cytocompatibility.
4. Printable screening platform.
5. Great stability for long-term observation.

Competing Products:

1. Corning Matrigel matrix

Intellectual Properties:

Our team has abundant experiences on the investigation of cell-biomaterial interaction, and published several reports focused on the cellular spheroid formation by using biomaterials. On the other hand, we also accumulated sufficient experiences on the development of bioinks and application of 3D bioprinting. The biomaterials and bioinks related to cellular spheroid formation and 3D bioprinting have been claimed to potent protection.

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