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(54) Title: MICROFLUIDIC 3D PRINTING TECHNOLOGY-BASED CULTURED MEAT PRODUCTION DEIVCE AND USE THEREOF

(54) 发明名称: 一种基于微流控3D打印技术的细胞培养肉生产设备及其应用

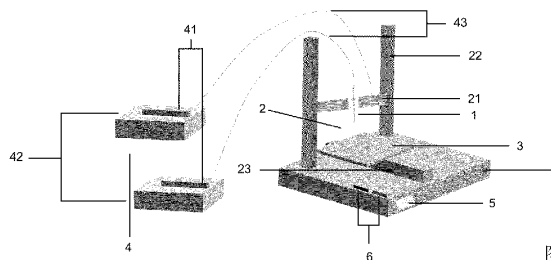


图 1

(57) Abstract: Disclosed are a microfluidic 3D printing technology-based cultured meat production device and a use thereof. The device comprises a printing nozzle, a printing moving system, a loading platform, a sample injection system and a base. The printing moving system is disposed on the base and is composed of a plurality of movable optical axes. The printing nozzle is disposed on a movable optical axis, the sample injection system is connected to the printing nozzle, and the printing nozzle is a micro-fluidic chip. The present invention is based on microfluidic 3D printing, where biological ink is extruded by means of a microfluidic chip to form printed fibers that, under the drive of the printing moving system, are stacked for formation to achieve single-step construction of a piece of three-dimensional tissue having tissue anisotropy, which is used for cultured meat production. The described device is easy to operate and offers rapid formation; and the structure, quantity and the like of microfluidic chips may be designed and flexibly replaced or adjusted as needed. Meanwhile, seed cells are directionally arranged within the fibrous basic structure of printed three-dimensional tissue and are further migrated and fused, thereby enhancing the differentiation and maturation of seed cells, as well as the efficiency of synthesizing relevant proteins.

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本国际公布:
— 包括国际检索报告(条约第21条(3))。
— 包括经修改的权利要求(条约第19条(1))。

(57) 摘要: 本发明公开了一种基于微流控3D打印技术的细胞培养肉生产设备及其应用, 该设备包括打印喷头、打印移动系统、载物平台、进样系统、底座, 打印移动系统置于底座上并由多个可移动光轴组成, 打印喷头设置在移动光轴上, 进样系统与打印喷头相连接, 打印喷头为微流控芯片。本发明基于微流控3D打印, 生物墨水经微流控芯片挤出形成打印纤维, 并在打印移动系统的带动下堆叠成型, 实现一步式构建具有组织各向异性的整块三维组织用于细胞培养肉生产, 其操作简单、成型迅速, 微流控芯片的结构、数量等可按需设计和灵活替换、增减, 且种子细胞在打印三维组织的纤维状基本结构中定向排列并进一步迁移、融合, 提高了种子细胞的分化成熟及相关蛋白的合成效率。