

(12) 按照专利合作条约所公布的国际申请

(19) 世界知识产权组织
国际局



(10) 国际公布号
WO 2024/007982 A1

(43) 国际公布日
2024 年 1 月 11 日 (11.01.2024)

(51) 国际专利分类号:

C12N 5/077 (2010.01) *D01F 1/10* (2006.01)
D01F 8/18 (2006.01) *A23J 3/22* (2006.01)
D01F 8/02 (2006.01)

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(21) 国际申请号: PCT/CN2023/104613

(22) 国际申请日: 2023 年 6 月 30 日 (30.06.2023)

(25) 申请语言: 中文

(26) 公布语言: 中文

(30) 优先权:

202210777912.4 2022 年 7 月 4 日 (04.07.2022) CN

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(54) **Title:** MICROFLUIDIC BIOMIMETIC FIBER FOR PRODUCING CELL CULTURED MEAT, AND PREPARATION METHOD THEREFOR AND USE THEREOF

(54) 发明名称: 一种用于细胞培养肉生产的微流控仿生纤维及其制备方法和应用

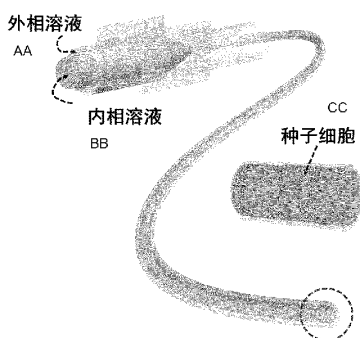


图 1

AA Outer phase solution
BB Inner phase solution
CC Seed cells

(57) **Abstract:** Provided are a microfluidic biomimetic fiber for producing cell cultured meat, a preparation method therefor and the use thereof. The microfluidic biomimetic fiber has a shell-core structure, wherein the shell is formed by means of crosslinking a cell-non-adhesive high polymer, and the inner core wrapped by the shell is a hydrogel solution mixed with seed cells. Inner phase fluid and outer phase fluid are respectively introduced into an inner phase channel and an outer phase channel of a microfluidic device, the two-phase fluid forms a stable laminar flow structure in a microfluidic device channel by means of adjusting the flow velocities of the inner phase and the outer phase, which is extruded from an outlet of the device to obtain biomimetic fiber. The method for constructing the biomimetic fiber on the basis of the microfluidic technique has the advantages of simple preparation, rapid prototyping and mild reaction. The prepared biomimetic fiber can be used for cell cultured meat production after culturing. The seed cells in the biomimetic fiber are directionally arranged, migrated, fused and grown in a fiber carrier, and therefore the differentiative capacity of the seed cells is significantly improved, the synthesis of muscle-related protein is increased, and the efficiency of cell cultured meat production is improved.

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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: 提供一种用于细胞培养肉生产的微流控仿生纤维及其制备方法和应用, 该微流控仿生纤维具有"壳-核"结构, 外壳由具有细胞非粘附性的高聚物交联后形成, 外壳包裹的内核为混有种子细胞的水凝胶溶液。将内、外相流体分别通入微流控装置内、外相通道中, 通过调节内、外相流速使两相流体在微流控装置通道形成稳定的层流结构, 从装置出口处挤出获得仿生纤维。基于微流控技术构建仿生纤维, 制备方法简单、成型快速、反应温和, 制备的仿生纤维经过培养后可应用细胞培养肉生产, 仿生纤维中的种子细胞在纤维载体中定向排列、迁移和融合生长, 进而使种子细胞的分化能力得到显著提升, 肌肉相关蛋白合成增加, 提高细胞培养肉生产效率。