

Methods for Producing Cultured Meat that has Heterogeneous Composition

Tech ID: 31737 / UC Case 2019-311-0

SUMMARY

UCLA researchers in the Departments of Integrative Biology and Physiology and Molecular, Cellular, and Developmental Biology have developed a novel method for the production of marbled, cultured meat with desirable texture and flavor.

BACKGROUND

Revolutions in food production are necessary to support a growing global population, which is projected to expand by 30% over the next 30 years. Meat is the primary source of protein for many societies and is therefore an attractive target for agricultural innovation. In particular, beef is widely consumed due to its relatively low cost and ready availability, while remaining both energy-dense and nutrient-rich. However, industrial livestock farming requires the greatest amounts of non-renewable energy, water, and land use, and produces total greenhouse gas emissions above all foods. One strategy to reduce the environmental impact of beef production is to culture alternative meat options ex vivo from cells. Current approaches rely on culturing a single type of cell to create a unified meat product. Developing new methods to culture meat can lead to beef with delicious flavor, texture, and tunable nutritional content, as well as broad consumer appeal which is critical to minimize the harmful environmental effects of the human diet.

INNOVATION

UCLA researchers have established a method to produce cultured beef with desirable texture and flavor, which has potential to achieve significant environmental benefits over conventional beef. Cultured marbled beef is made by tuning the number of fat cells that are interspersed among muscle cells, to result in the typical ‘marbling’ feature of highly prized beef. This strategy should preserve the appropriate sensory features of beef, while improving the texture and flavor compared to single cell type culture. The ratio of fat within the muscle is tunable and can enable improved nutritional content compared to conventional or pure myocyte cultured beef. Further, marbled culture meat will provide an environmentally sustainable alternative to beef production with reduced energy, water, land use, and greenhouse gas emissions. This method of beef culture is scalable to feed the growing global population, which is especially critical in the face of the earth’s changing climate and land use.

APPLICATIONS

- ▶ Cultured meat for consumption
- ▶ Environmental sustainability
- ▶ Beef with enhanced nutritional profile

ADVANTAGES

- ▶ Preserves desirable sensory properties of beef
- ▶ Increased texture and flavor beyond single cell type cultured meat
- ▶ Recreates ‘marbling’ feature of high-end conventional beef and other marbled products
- ▶ Environmental benefits including: estimated reductions in energy (45%), water (96%), land use (99%), and greenhouse gas emissions (96%) compared to conventional beef
- ▶ Scalable, alternative food production method

STATE OF DEVELOPMENT

CONTACT

UCLA Technology Development Group
 ncd@tdg.ucla.edu
 tel: 310.794.0558.



INVENTORS

- ▶ Rowat, Amy C.

OTHER INFORMATION

KEYWORDS

Cultured meat, cultured beef, food science, food, marbled, nanofiber, nanofiber scaffold, myocytes, myotubes, co-culture, microporous scaffold

CATEGORIZED AS

- ▶ **Agriculture & Animal Science**
 - ▶ Animal Science
 - ▶ Other
- ▶ **Biotechnology**
 - ▶ Food
- ▶ **Nanotechnology**
 - ▶ Materials

RELATED CASES

2019-311-0

Myotube formation from myocytes has been demonstrated on structured, aligned nanofibers. Pectin, alginate, and gelatin can be mechanically tuned for cell-type specific growth, and will therefore be used as scaffold materials.

PATENT STATUS

Country	Type	Number	Dated	Case
European Patent Office	Published Application	3959303	03/02/2022	2019-311
United States Of America	Published Application	2020/219755	10/29/2020	2019-311

ADDITIONAL TECHNOLOGIES BY THESE INVENTORS

► [Mechanical Phenotyping Of Single Cells: High Throughput Quantitative Detection And Sorting](#)

Gateway to Innovation, Research and Entrepreneurship

UCLA Technology Development Group

10889 Wilshire Blvd., Suite 920, Los Angeles, CA 90095

<https://tdg.ucla.edu>

Tel: 310.794.0558 | Fax: 310.794.0638 | ncd@tdg.ucla.edu

© 2019 - 2022, The Regents of the University of California

[Terms of use](#)

[Privacy Notice](#)

