# Article information:

培养人类微生物群和培养组学 |自然评论微生物学
<https://www.nature.com/articles/s41579-018-0041-0>

# Article summary:

1. Culturomics is a culturing approach that uses multiple culture conditions, MALDI-TOF mass spectrometry and 16S rRNA sequencing for the identification of bacterial species.

2. Environmental and clinical microbiologists have contributed to the revival of culture in microbiology by developing methods and media that mimic natural environments, using dilution culture to detect minority populations, co-culture to provide growth-promoting factors, and identifying deficiencies in nutrients and signalling molecules in standard media.

3. The revival of culture in clinical microbiology laboratories was initiated by microbiologists specializing in the culture of intracellular bacteria, who developed techniques such as the shell-vial technique and axenic media design based on genome sequencing of isolates obtained in pure culture.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

该文章主要介绍了微生物群和宏基因组学的培养方法，其中重点介绍了culturomics这种多重培养条件、MALDI-TOF质谱和16S rRNA测序相结合的方法。然而，该文章存在以下几个问题：

1. 偏见来源：该文章对于微生物群和宏基因组学的培养方法只进行了简单的介绍，并没有深入探讨其优缺点及潜在风险。同时，该文章对于环境微生物学家和临床微生物学家所做出的贡献也只是简单提及，并未全面呈现。

2. 片面报道：该文章只介绍了一种培养方法，即culturomics，并未涉及其他常用的培养方法。同时，该文章并未提到目前仍存在很多难以培养的微生物种类，如肠道菌群中的某些菌株。

3. 无根据主张：该文章中提到“great plate count anomaly”这一概念来描述自然环境中细胞数量与可形成活性菌落数量之间的差异。然而，该说法并没有得到足够证据支持。

4. 缺失考虑点：该文章并未考虑到不同培养方法对微生物群落结构的影响，以及培养过程中可能引入的偏差。

5. 主张缺失证据：该文章中提到环境微生物学家使用稀释培养法来检测少数菌群。然而，该方法并未得到足够的证据支持其准确性和可靠性。

6. 未探索反驳：该文章并未探讨其他学者对于culturomics这种培养方法的质疑和反驳。

7. 宣传内容：该文章似乎在宣传culturomics这种培养方法，并未客观地呈现其优缺点及潜在风险。

综上所述，该文章存在一定的偏见和片面性，需要更全面客观地呈现微生物群和宏基因组学的培养方法及其应用。同时，需要更深入地探讨不同培养方法对微生物群落结构的影响，并注意到可能存在的风险。

# Topics for further research:

* 微生物群和宏基因组学的优缺点及潜在风险
* 其他常用的微生物培养方法
* great plate count anomaly概念的证据支持
* 不同培养方法对微生物群落结构的影响和可能引入的偏差
* 稀释培养法的准确性和可靠性证据
* 对culturomics培养方法的质疑和反驳

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