



发光学应用及交叉前沿

基于拉曼光谱的微重力三维培养条件下的人HepG2细胞的研究

王雁军¹, 王桂文², 姚辉璐²

1. 中国科学院动物研究所膜工程与生物膜国家重点实验室 细胞生物学系, 北京 100101;

2. 广西科学院 生物物理实验室, 广西 南宁 530003

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摘要：采用一个波长为785 nm的半导体激光束来囚禁人的肝癌细胞并激发人的肝癌细胞的拉曼光谱,分析模拟微重力三维培养条件下的人肝癌细胞的DNA、蛋白和脂类的生物学物质的变化和表达情况。结果显示,微重力三维培养条件下和平面培养下的人肝癌细胞的拉曼光谱在527.1 367.1 438.1 659 cm⁻¹处有明显的差异。

关键词：人肝癌细胞 微重力 三维培养 拉曼光谱

Study on Liver Cancer Cells (HepG2) Under Simulated Microgravity Based on Raman Spectroscopy

WANG Yan-jun¹, WANG Gui-wen², YAO Hui-lu²

1. State Key Laboratory of Biomembrane and Membrane Biotechnology, Institute of Zoology, Chinese Academy of Sciences (CAS), Beijing 100101, China;

2. Laboratory for Biophysics, Guangxi Academy of Sciences, Nanning 530003, China

Abstract: In our work, HepG2 was cultured onto biodegradable polyglycolic acid(PGA) polymer scaffolds, which was cultured in a rotating cell culture system (RCCS) to form a three-dimensional (3D) and human liver cancer cells cultured in common plate. We detected the spectra of HepG2 cells under two culture conditions and compared the spectra changes of the different cells under two culture conditions. The results show that Raman spectroscopy can differentiate among HepG2 cells under two culture conditions. 527 cm⁻¹ and 1 357 cm⁻¹ peaks of HepG2 cells under simulated microgravity are higher than that of HepG2 cells in common plate. 1 438 cm⁻¹ and 1 659 cm⁻¹ peaks of HepG2 cells under simulated microgravity are lower than that of HepG2 cells in common plate. It is known that 527 cm⁻¹ represents Fe(II), N-N-Melm, 1 357 cm⁻¹ represents Guanine, porphyrins (haemoglobin), lipids, 1 438 cm⁻¹ represents CH₂ deformation (lipids), cholesterol, and 1 659 cm⁻¹ represents Amide I: proteins. These biomaterials which induce these peak changes are possibly related to 3D culture.

Keywords: liver cancer cells simulated microgravity three dimensional culture Raman spectroscopy

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通讯作者: 姚辉璐, E-mail: huiluy@gmail.com

作者简介: 王雁军(1976-), 女, 辽宁丹东人, 主要从事肝脏病和激光拉曼光谱的研究。E-mail: wangyanjun117@163.com

作者Email: huiluy@gmail.com

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