

integrin $\beta 1$ 在不同细胞周期肝癌细胞与内皮细胞粘附中的作用

宋关斌*、罗庆、申小东、严润彬、秦建、邓小燕、蔡绍哲
重庆大学生物工程学院, 教育部生物力学及组织工程重点实验室

探讨了 integrin $\beta 1$ 在不同细胞周期人肝癌细胞 (SMMC-7721) 上的表达和在肝癌细胞与人脐静脉内皮细胞粘附过程中的作用。未同步处理的肝癌细胞 (对照组) 各细胞周期时相百分比为 G₀/G₁ 期 53.51%、G₂/M 期 11.01%、S 期 35.48%，采用胸腺嘧啶脱氧核苷、秋水仙碱顺序阻断和胸腺嘧啶脱氧核苷双阻断后释放培养的方法获得 G₁ 期和 S 期的肝癌细胞，其同步率分别为 74.09% 和 98.29%。G₁ 期肝癌细胞 integrin $\beta 1$ 表达的荧光强度较 S 期和对照组相应值明显降低。利用微管吸吮技术定量研究了肝癌细胞与内皮细胞之间的粘附力学特性，发现 G₁ 期肝癌细胞的粘附力值比 S 期相应值明显降低 ($P < 0.01$)，而 S 期的粘附力值与对照组比较无明显差别，integrin $\beta 1$ 在肝癌细胞与内皮细胞粘附过程中的贡献约 50%。结果提示：胸腺嘧啶脱氧核苷和秋水仙碱能较好地将肝癌细胞同步于 G₁ 期和 S 期，integrin $\beta 1$ 在 SMMC-7721 肝癌细胞上的表达水平呈现周期差异，在肝癌细胞与内皮细胞粘附过程中，S 期细胞可能起的作用更大，integrin $\beta 1$ 在这一粘附过程中起着重要作用。

ROLES OF INTEGRIN $\beta 1$ ON ADHESION BETWEEN DIFFERENT CYCLIC HEPATOCELLULAR CARCINOMA CELLS AND HUMAN UMBILICAL VEIN ENDOTHELIAL CELLS

To investigate expression of integrin $\beta 1$ and its roles on adhesion between different cyclic hepatocellular carcinoma cells (HCC) and human umbilical vein endothelial cells (HUVECs), the synchronous G₁ and S phase HCC were achieved through thymine-2-desoryriboside and colchicines sequential blockage method and double thymine-2-desoryriboside blockage method, respectively. Expression of integrin $\beta 1$ on hepatocellular carcinoma cells was detected with mono-antibody blockage technique and flow cytometer. Further, the adhesive force between HCC and HUVEC and the role of integrin $\beta 1$ in this adhesive course were studied by micropipette aspiration technique. The results showed that percentage of each phases of the control HCC cell cycle are 53.51% of G₀/G₁ phase, 11.01% of G₂/M phase and 35.48% of S phase, while the synchronous rates of G₁ and S phase SMMC-7721 cells amount to 74.09% and 98.29%, respectively. The expressive fluorescent intensity of integrin $\beta 1$ in G₁ phase HCC is depressed significantly than the values of S phase and non-synchronized HCC. Accordingly, the adhesive forces of G₁ phase HCC to HUVEC was significantly lower than the value of S phase cell ($P < 0.01$), but it has no remarkable difference when compared the value of S phase HCC with controlled HCC; the contribution of integrin $\beta 1$ was about 50% in this adhesive process of HCC and HUVEC. It suggested that HCC would be synchronized preferably in G₁ and S phase with thymine-2-desoryriboside and colchicines, the expression of adhesive molecule integrin $\beta 1$ present difference in G₁ and S phase HCC. Possibly, S phase cells take a great action in HCC's adhesion to HUVEC, and integrin $\beta 1$ play an important roles in this adhesive course.

关键词