

综述

# 纺锤体检测点机制对细胞周期的调控

刘子杰;翁亚光

400016, 重庆医科大学医学检验系(教育部重点实验室)

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**摘要** 细胞周期的各个步骤是连续进行的,各个步骤都受到严格而精细的调控,在某一个环节出现错误将会妨碍后续过程的进行,进而出现细胞分裂错误而导致非整倍体细胞,肿瘤细胞形成或细胞死亡。有丝分裂的后期染色体分离到两个子代细胞中,只有染色体平均分配到子代细胞中才能保证遗传的稳定性,但细胞分裂是一个不可逆的过程,所以染色体的分离是细胞分裂最为重要的一个步骤,这一步骤受到一种称为纺锤体监测点(spindle checkpoint, SCP)机制的严格调控。这种机制在纺锤体组装出现错误或染色体与微管连接出现错误时就会激活,激活后对细胞周期发出一个阻碍信号进而影响两个主要的细胞周期过程①只有两个染色单体与来自两极的微管形成稳定而且正确的连接后,后期才开始进行;②直到姊妹染色单体正确的分离后有丝分裂才结束。本文主要是介绍SCP对前一个过程的调控作用。

**关键词** [纺锤体](#); [纺锤体检测点](#); [细胞周期](#); [着丝点](#); [有丝分裂](#)

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Clinical Diagnosis Laboratory , Chongqing University of Medical Science

LIU Zi-jie, WENG-Ya-guang

Key laboratory of Ministry of Education , Chongqing 400016, P. R. China

**Abstract** Each step of cell cycle is processed continuously and regulated by strict and precise mechanism. Some errors in each section of this cycle will impede the following progress, resulting in mis-take

of cell division leading the formation of aneuploid cell, tumor cell or cell death. In the Anaphase of mitosis, chromosomes separate into two daughter cells. Only chromosomes are distributed equally into daughter cells can ensure the genetic stability. Cell division is irreversible, so the segregation of chromosome is one of the most important steps. Which is regulated by this mechanism called spindle checkpoint(SCP). It can be activated as long as there is abnormality of spindle assembling and connection between chromosomes and microtubule. This activation sends out a repressing signal to influence two major courses of cell cycle(1) under condition that two chromatids link with the microtubule from double pole stably and correctly, cell cycle can be started.(2) until the sister chromatids separate exactly, mitosis can fall the curtain.

**Key words** [Spindle](#) [Spindle checkpoint](#), [Cell cycle](#), [Kinetochore](#) [Mitosis](#)

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通讯作者 翁亚光 [wengyaguang@126.com](mailto:wengyaguang@126.com)

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