

Bölüm 5

HÜCRE DÖNGÜSÜ ve KONTROL NOKTALARI

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Hücre döngüsü, hücresel bileşenlerin ikiye katlandığı ve daha sonra yavru hücrelere doğru bir şekilde ayrıldığı olaylar dizisidir. Ökaryotlarda, DNA replikasyonu ayrı bir sentez veya S-fazı ile sınırlıdır ve kromozom ayrımı mitoz veya M-fazında meydana gelir. İki gap fazı, G1 ve G2 olarak bilinen S fazını ve mitozu ayırır.

Hücre döngüsü ilerlemesini bozan herhangi bir şey, belirli bir hücre popülasyonunun azalmasına veya genişlemesine yol açabilir. Tümör hücrelerinde; çoğalmayı durduran sinyal yollarını bozan, çoğalmaya neden olan yolları aktive eden mutasyonlar geliştiği açıktır. İnsan tümör hücrelerinin hem hücre döngüsü hem de kontrol noktası yollarının anahtar bileşenleri içinde mutasyonları vardır. Bu bölümde hücre döngüsü mekanizması ve kontrol noktası sinyalizasyonuna odaklanarak, hücre döngüsün kanserdeki yeri anlatılmıştır.

HÜCRE BÖLÜNME DÖNGÜSÜ

Hücre bölünmesi, sıralı kontrol noktalarından geçer. İlk G_0 olan durağan hücreden bölünme işlemine hazırlandığı G1'e hareket eder. Böylelikle hücre boyutunu kaybetmeden iki hücreye geçiş için proteinler sentezlenir. Hücre daha sonra DNA sentez fazına veya kromozomların her birinin bir kez kopyalandığı S fazına girer. Bunu, G2 fazı izler ve sonra mitozu başlatır. Mitozun tamamlanması üzerine, yavru hücreler, ortama bağlı olarak, durağan veya ikinci bir hücre bölünmesi turu başlatabilir (Şekil 1).

Hücre döngüsünün farklı fazları boyunca ilerleme, hücre bölünmesi için ge-

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