BÖLÜM 10

İLAÇ KEŞFİNDE VERİMLİLİK VE HASSASİYETİ ARTIRMAYA YÖNELİK YENİLİKÇİ STRATEJİLERİ

Mehtap TUGRAK SAKARYA[1]

GİRİŞ

Medisinal kimya, farmasötik bileşiklerin tasarımı, geliştirilmesi ve optimizasyonuna odaklanan disiplinler arası bir alandır. Kimya, biyoloji ve farmakoloji ilkelerini bir araya getirerek hastalıkları etkili şekilde tedavi edebilecek biyoaktif moleküllerin oluşturulmasını amaçlamaktadır (1). Bu alandaki temel araştırma konuları arasında yeni bileşiklerin sentezi, yapı-aktivite ilişkisi (SAR) çalışmaları, ilaç özelliklerinin (örneğin çözünürlük ve biyoyararlanım) optimizasyonu ve farmakolojik etkilerin değerlendirilmesi yer almaktadır. Küçük moleküllü ilaçların keşfi ve tasarımı, medisinal kimya alanında büyük bir öneme sahip olmuş ve çok sayıda hastalıkla mücadelede yeni tedavilerin geliştirilmesinde temel yapı taşını oluşturmuştur (2). Küçük moleküller, tarihsel olarak kanser, enfeksiyon hastalıkları ve kronik rahatsızlıklar gibi birçok hastalığın etkili tedavisinde kritik bir rol oynamıştır (3-5). Ancak, küçük moleküllü ilaç keşfi süreci çeşitli zorlukları da içerisinde barındırmaktadır. Klinik denemelerde yüksek başarısızlık oranları, biyolojik sistemlerin karmaşıklığı ve hassas hedeflere yönelik tedavilere duyulan ihtiyaç gibi etkenler bu süreci zorlaştırmaktadır (3, 6, 7). Bu nedenle, küçük moleküllü ilaç tasarımının etkinliğini ve başarısını artıracak yenilikçi yaklaşımlara duyulan ihtiyaç giderek artmaktadır (8). Geleneksel yöntemler çoğunlukla deneme-yanılma esasına dayanmakta olup, bu süreç hem zaman alıcı hem de yüksek kaynak tüketimi gerektiren bir yapıya sahiptir. Buna ek olarak, biyolojik sistemlerin karmaşıklığı ve hastalıkların çeşitliliği, ilaç tasarımında daha hedefe yönelik ve stratejik yaklaşımların benimsenmesini zorunlu kılmaktadır. Bu bağlamda, kü-

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