

BÖLÜM 11

BİYOSENSÖRLER VE LATERAL AKIŞ (LFA) TESTLERİNİN MİKROBİYOLOJİK TANIDA KULLANIMI



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Biyosensörlere Genel Bakış

Uluslararası Temel ve Uygulamalı Kimya Birliği (IUPAC) tanımına göre biyosensörler, biyolojik öneme sahip bir biyomolekülün tespiti için biyomolekülün konsantrasyonu ile orantılı şekilde ölçülebilir bir sinyal oluşturmak üzere bir biyolojik öğeyi (biyoalgılayıcı bileşenler) bir fizikokimyasal bileşenle (biyodönüştürücü bileşen) birleştiren analitik cihazlardır^{1,2}. Bir biyosensörde temel amaç biyokimyasal bir sürecin elektriksel sinyale çevrilmesidir².

İnsanlık tarihinde, pandemik ve endemik salgınlar nedeniyle milyonlarca kişi hayatını kaybetmiştir. Bilimsel gelişmeler ve sağlık sistemlerindeki başarılarla rağmen salgın riskleri artarak devam etmektedir. Özellikle fekal-oral yolla bulaşan bakteriyel ve viral salgınlar her yıl milyonlarca can almaktadır. Solunum yoluyla yayılan salgınlar -1918'de influenza, 2003'te Şiddetli Akut Solunum Sendromu [Severe Acute Respiratory Syndrome (SARS)], 2012'de Orta Doğu Solunum Sendromu [Middle East respiratory syndrome (MERS)] ve

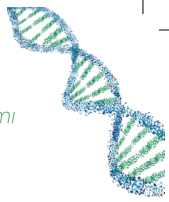
2019'da Coronavirus disease-19 (COVID-19) pandemileri- nedeniyle milyonlarca ölüm olmuştur^{2,4}.

SARS-CoV-2 virüsünün neden olduğu COVID-19 Aralık 2019'da ortaya çıkmasından bu yana hızla tüm dünyaya yayılmış, pandemiye dönüşmüş ve küresel insan sağlığı için önemli bir tehdit oluşturmuştur. Pandemi sadece küresel sağlığı değil ülkelerin ekonomisini, sosyal istikrarını ve toplumun uygarlık sürecini önemli ölçüde etkilemiştir. Öncelikli olarak toplum sağlığını korumak ve iyileştirmek amacıyla hastalıkların zamanında tanımlanması ve müdahale edilmesi için yeni hasta-başı [point-of-care (POC)] teşhis yöntemleri geliştirmenin önemi giderek artmaktadır^{2,4,6}.

Bulaşıcı hastalıkların yönetiminde üç ana strateji vardır: Enfeksiyon kaynağının kontrolü, bulaş yollarının kesilmesi ve enfeksiyon açısından risk altında olan kişilerin korunması. Bu üç stratejiden erken tanı, erken izolasyon ve hasta bireylerin erken tedavisini gerektiren enfeksiyon kaynağının kontrolü için hassas, hızlı ve doğru tespit metotları ve cihazlarına ihtiyaç bulunmaktadır. Bulaşıcı has-

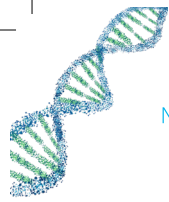
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