

Hücre Bazlı Nanotaşıyıcı Sistemler-Eksozomlar

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| Giriş

Hücre bazlı nanosistemlerin taşıyıcı olarak kullanılması son yıllarda dikkat çeken ve umut verici bir stratejidir. Hücre bazlı nanotaşıyıcılar biyomimetik nanotaşıyıcılar olup, ekstraselüler veziküller (EV) ve hücre membranıyla kaplı nanotaşıyıcılar olarak sınıflandırılmaktadır. Biyomimetik nanotaşıyıcılar; hastalıkların mikroçevresini taklit eden bir ortam oluşturmak, mikroorganizma, hayvan veya insandan kaynaklanan endojen maddelerin izolasyonu veya bu endojen maddelere yapı ve fonksiyon olarak benzer ürünlerin sentezi şeklinde elde edilen ve özellikle tümör bölgesi gibi hedef bölgelerin karakteristik özelliklerini taklit ederek, terapötik ajanların spesifik etki bölgelerine iletilmelerini sağlamaya yönelik nanotaşıyıcıları biyomimetik teknolojisiyle birleştiren umut verici nanotaşıyıcılardır (1, 2).

EV'ler, hücreler tarafından ekstraselüler boşluğa salgılanan lipide bağlı veziküllerdir. miRNA'lar, plazma zarı ve sitozol gibi önemli işlevleri olan pek çok proteini, lipitleri ve nükleik asitleri içermektedirler.

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bulunmaktadır. Eksozomun kaynağına göre içerdiği biyobelirteçler de çeşitlilik göstermektedir.

Eksozomların kanser başta olmak üzere parkinson, Alzheimer, kalp hastalıkları, inflamatuvar hastalıklar, serebrovasküler hastalıklar, depresyon, anksiyete, demanslar, Diabetes mellitus, HIV, AIDS ve hepatit C gibi tedavisi zor viral hastalıklar gibi pek çok hastalığın teşhis ve tedavisinde ve antiretroviral aşuların üretilmesinde kullanılabilme potansiyelleri ile ilgili akademik ve klinik çalışmalar devam etmektedir. Günümüzde eksozom ile yapılan çalışmalar çeşitli kanser türlerinde yoğunlaşmış ve eksozomların kanseri tedavi etme potansiyellerinin yüksek olduğu pek çok çalışma ile kanıtlanmıştır. Bu umut verici sonuçlara rağmen, kanser hücrelerinden elde edilen eksozomların tümör ilerlemesinde metastaza yol açma risklerinin de bulunduğu göz ardı edilmemelidir. Bunun yanı sıra, eksozomların teşhis/tedavide kullanılabilmeleri için ölçek büyütme ve standardizasyonla ilgili zorlukların da üstesinden gelinmesi gerekmektedir. Bu engellere rağmen, eksozomlar ilaç taşıyıcı sistem olarak kullanılmak üzere oldukça ümit vadeden sistemler olarak görülmektedir. Eksozomlara ilaç yüklemesi genellikle sonikasyon, inkübasyon, elektroporasyon gibi aktif yükleme yöntemleri ile yapılmaktadır. Eksozoma ilaç ya da miRNA, siRNA gibi aktif bileşenlerin yüklendiği çok az sayıda çalışma bulunmaktadır. Eksozomlara ilaç/aktif bileşen yüklenmesi ile ilgili daha ayrıntılı çalışmaların yapılması gerekmektedir. Gelecekte farmasötik alanda ilaç/aktif bileşen yüklü eksozomların ilaç taşıyıcı sistem olarak teşhis ve tedavi amacıyla kullanılmalarının oldukça geniş yer tutacağı düşünülmektedir.

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