Abbas Parham
(Iran)

MESENCHYMAL STEM CELLS ARE A NEW EFFICIENT CANDIDATE FOR CANCER THERAPY

In these days, cancer is one of the main causes of mortality and morbidity in all countries. Unfortunately, current conventional cancer therapies (such as surgery, chemotherapy and radiotherapy) are symptomatic and passive in nature. Tumors especially malignant tumors remain unresponsive to traditional therapy despite of improved treatments. The majority of cancer patients die from the recurrence of metastasis or therapy-related life-threatening complications. The absence of sufficient specificity is the major obstacle for effective cancer therapy. Therefore, it is critical to explore efficient strategies specifically targeting neoplasms.

Since the discovery of the tumor-oriented homing capacity of mesenchymal stem cells (MSCs), the application of specific anticancer gene-engineered MSCs has held great potential for cancer therapies. Mesenchymal stem cells are the first type of stem cells to be utilized in clinical regenerative medicine. MSCs can be easily derived from different tissues such as bone marrow, fat tissue and umbilical cord blood. MSCs have capability of multipotent differentiation as well as fast proliferation. Moreover, MSCs show many other therapeutically advantageous features, such as the feasibility of autologous transplantation, immunomodulatory effects and a powerful paracrine function. More recently, the specific tumor-oriented migration and incorporation of MSCs have been demonstrated in various pre-clinical models, revealing the potential for MSCs to be used as ideal vectors for delivering anticancer agents.

Compared to other vehicles and/or delivery platforms as therapeutic carriers, MSCs have some advantages. First, tumortropic properties would make MSCs accumulate specifically at the tumor site for better delivery of therapeutic reagents. Second, MSCs are able to modulate the responses of the immune system. These properties will help in increasing MSC survival after transplantation. As the 3rd advantages, use of autologous stem cells faces no issue with the immune responses and would increase cell survival after transplantation, leading to

more effective delivery. These advantages suggest that MSCs can be efficiently used as vehicles to carry and deliver therapeutic reagents for cancer therapy. Nonetheless, challenges faced when using MSCs for this application and strategies to overcome them should be considered. These include strategies to improve uptake of anticancer drugs by MSCs, to maintain MSC viability while carrying cytotoxic anti-cancer drugs, to control the release profiles of drug-loaded nanoparticles, and the fate of MSCs *in vivo*.

The strategy is based on MSCs' capacity of tumor-directed migration and incorporation and *in situ* expression of tumor-specific anticancer genes such as interferon β (IFN-β), IFN-γ, interleukin 12 and 24, tumor necrosis factor-related apoptosis inducing ligand (TRAIL) or suicide gene/enzyme prodrugs. With the aim of translating bench work into meaningful clinical applications, in the current presentation, following a general description of MSCs I describe the interactions of MSC with cancers and the dual-targeted anticancer potential of engineered MSCs.

Аббас Пархем
(Иран)

МЕЗЕНХИМАЛЬНЫЕ СТВОЛОВЫЕ КЛЕТКИ КАК НОВОЕ ЭФФЕКТИВНОЕ СРЕДСТВО ЛЕЧЕНИЯ РАКА

Рак является одной из основных причин смертности и заболеваемости во всех странах. К сожалению, в настоящее время традиционные методы лечения рака (такие как хирургия, химиотерапия и лучевая терапия) являются симптоматическими и носят пассивный характер.

Отсутствие соответствующих знаний о природе болезни является основным препятствием для эффективной терапии рака.

С момента открытия способности мезенхимальных стволовых клеток (МСК), ориентироваться по направлению к опухоли, применение противораковых клеток (МСК), разработанных на основе генов, открыла большие возможности в лечении рака.

Было продемонстрировано специфичное перемещение клеток в направлении опухолей, которое раскрыло широкие возможности в использовании МСК в качестве идеального способа для доставки противоопухолевых агентов.

По сравнению с другими способами МСК имеют некоторые преимущества: 1) они имеют свойства передвигаться к опухолям, 2) обладают иммуномодулирующим эффектом, и 3) они более эффективны с точки зрения доставки. Таким образом, стратегия основана на способности МСК перемещаться в направлении к опухолевым очагам, встраиваться к ним, и выдавливать на месте специфические противоопухолевые клетки, такие как IFN-бета, IFN-gamma, IL 12 и 24. Тем не менее, остаются нелегкие вопросы, связанные с использованием МСК, которых необходимо рассмотреть и выработать стратегию по их решению.

Abbas Parhem
(Eýran)

MEZENHIMAL SÜTÜN ÖÝJÜKLERI DÜWNÜK KESELINI BEJERMEGIŇ TÄZE NETIJELI SERIŞDESI HÖKMÜNDE

Keseliň tebigaty barada düşünjäniň bolmazlygy düwnük keselini netijeli bejermegiň esasy kynçylygy bolup durýar.

Mezenhimal sütün öýjükleriniň (MSÖ) düwnüge garşy täsir etmekliginiň açylmagy, genleriň esasynda döredilen düwnüge garşy öýjükleriň (MSÖ) ulanylmagy düwnük keselini bejermeklige uly mümkinçilikler döretdi.

Çiş agentlerini gowşurmaklygyň täsirli usuly hökmünde MSÖ-ni ulanmakda giň mümkinçilikleri açyp görkezýän çişe garşy öýjükleriň häsiýetli hereketi görkezildi.

Beýleki usullar bilen deňeşdirilende MSÖ-niň käbir artykmaç taraplary bar: 1) olarda çişe garşy hereket etmeklik häsiýeti bar; 2) immunomodulirleýji netijeliligi bar; 3) olar gowşurmaklyk nukdaýnazaryndan has netijelidir. Şeýlelik bilen, esasy ýörelge MSÖ-niň çiş ojaklaryna tarap hereketi başarýanlygyna, olaryň içine ornaşyp, şol ýerde ýörite IFN-beta, IFN-gamma, IL 12 we 24 çiş öýjüklerini gysyp çykarýanlygyna esaslanandyr. Şeýle-de bolsa MSÖ-ni ulanmak bilen baglanyşykly seredip geçmekliğiň we ýörelgesini kesgitlemekliğiň zerurlygy bolan aňsat bolmadyk meseleler galýar.