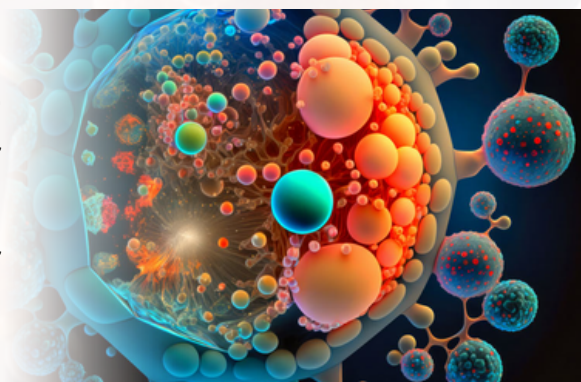


# HOW MSC EXOSOMES TREAT CANCER

Let's take a step back and understand how mesenchymal exosomes help in treating cancer in general. This explanation will be in simple terms so it's easy to follow.

## What Are Mesenchymal Exosomes?

Your body is made up of billions of cells. Some cells have special roles, like repairing damage or helping you heal. Mesenchymal stem cells (MSCs) are a type of repair cell found in places like your bone marrow, fat tissue and the umbilical cord. They release tiny bubbles called exosomes.



These exosomes are incredibly small—much smaller than cells—and they act like delivery vehicles, carrying "cargo" such as proteins, genetic instructions (like RNA), and other helpful molecules. They travel through your body to deliver this cargo to other cells.

## How Do Mesenchymal Exosomes Treat Cancer?

Cancer is a disease where certain cells in your body grow uncontrollably and refuse to die when they should. Exosomes help fight cancer in several ways:

### 1. Stopping Cancer Growth

Cancer cells grow much faster than normal cells. Exosomes can deliver messages to cancer cells that tell them to stop dividing so quickly. This helps slow down or even stop the tumor from growing.

### 2. Boosting Your Immune System

Your immune system is like your body's army, designed to protect you from harmful invaders, including cancer cells. But cancer is sneaky and can sometimes hide from your immune system. Exosomes can carry signals to wake up your immune cells and make them better at spotting and attacking cancer cells.

### **3. Starving the Tumor**

Tumors need a lot of nutrients to grow, and they often create their own blood supply to get them. Exosomes can block the formation of these blood vessels, effectively starving the tumor and stopping its growth.



### **4. Preventing the Cancer from Spreading**

Cancer cells can break away from the original tumor and spread to other parts of the body (a process called metastasis). Exosomes can change the environment around the tumor to make it harder for cancer cells to move and grow in new areas.

### **5. Improving the Effects of Other Treatments**

Cancer treatments like chemotherapy and radiation can be very harsh on the body. Exosomes can make cancer cells more sensitive to these treatments, which means they work better and can sometimes allow for lower doses, reducing side effects.

### **Why Are Mesenchymal Exosomes Special?**

One of the biggest challenges with cancer treatment is that many therapies damage healthy cells along with cancer cells. This is why treatments like chemotherapy often have tough side effects. Mesenchymal exosomes are much more precise—they focus on the cancer cells without harming healthy ones. This targeted approach could lead to fewer side effects and better outcomes for patients.

### **Where Is This Therapy Used?**

Mesenchymal exosome therapy is being used to treat all types of cancer at any stage.



## In Simple Terms:

Think of mesenchymal exosomes as tiny mail carriers that deliver special packages to the cancer cells. These packages carry instructions that:

- Slow down or stop the cancer from growing.
- Help your immune system fight back.
- Make it harder for the cancer to spread.
- Work alongside other treatments to make them more effective.

## How Mesenchymal Exosomes Help Cancer Patients During Chemotherapy

Mesenchymal exosomes are tiny particles that can help the body heal and reduce side effects during chemotherapy. Here's how they work:

### 1. Easing Chemotherapy Side Effects

**Lowering Inflammation:** Chemotherapy can cause swelling and irritation in the body, leading to problems like mouth sores, skin issues, and organ damage. Exosomes have special molecules that help calm down this inflammation, making patients feel better.

**2. Helping Blood Production:** Chemotherapy often lowers the number of blood cells, which can make patients feel tired and weak. Exosomes can support the bone marrow to produce healthy blood cells, reducing the need for blood transfusions.

### 3. Repairing and Healing Tissues

**Protecting Healthy Cells:** While chemotherapy kills cancer cells, it can also hurt healthy cells. **Exosomes help repair tissues** in the gut, skin, and mouth, which can reduce nausea, diarrhea, and mouth pain.

### 4. Shielding Organs:

Chemotherapy can harm important organs like the heart, liver, and kidneys. Exosomes help reduce this damage by promoting healing and reducing stress on the cells.

## 5. Improving Overall Well-Being

- **Boosting Energy:** By helping the body heal and reducing inflammation, exosomes can increase energy, reduce tiredness, and help patients feel better overall.