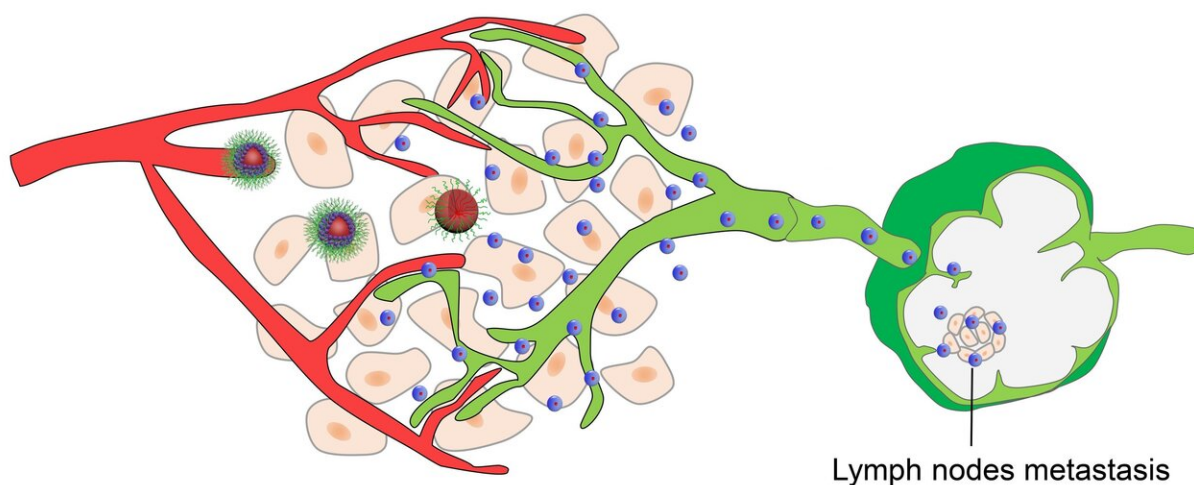


# Nanoparticle therapy targets lymph node metastases

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iClusters (red/blue/green circles) enter a tumor through the bloodstream (red vessels), then disassemble into smaller nanoparticle drugs (blue circles) that can pass through lymphatics (green vessels) into lymph nodes and kill metastases. Credit: *ACS Nano* 2019, DOI: 10.1021/acsnano.9b03472

Metastasis, in which cancer cells break free from the primary tumor and form tumors at other sites, worsens the prognosis for many cancer patients. The lymph nodes—glands of the immune system located throughout the body—are typically the traveling cells' first destination. Now, researchers have developed a strategy to target metastases in lymph nodes for destruction, before they can cause cancer at other

locations. They report their results in *ACS Nano*.

Soon after a patient is diagnosed with cancer, they typically undergo lymph node biopsies to determine if their cancer has spread. However, this [surgical procedure](#) can cause pain, infection and other problems. Studies have shown that [cancer cells](#) travel from tumors to specific [lymph nodes](#) primarily through tiny vessels called lymphatics, which carry immune cells and fluid rather than blood. So, a treatment that could be injected into the bloodstream, enter a tumor and then pass through the lymphatics might treat metastases. Hong-Jun Li, Jin-Zhi Du and colleagues had previously developed a nanoparticle delivery tool, called iCluster, that travels through the bloodstream to a tumor. It's a large cluster of nanoparticles, and the acidic environment of the tumor causes iCluster to disassemble into its smaller components, which can penetrate deep into tumors and deliver chemotherapies. But the team wondered whether these smaller nanoparticles could also pass through the lymphatics that connect the tumor to lymph nodes.

To find out, Li, Du and colleagues injected iCluster, labeled with a red dye, into the bloodstream of mice with transplanted tumors. By [fluorescent imaging](#), they observed that small nanoparticles carrying the chemotherapy drug cisplatin could indeed pass through the lymphatics from the tumor to adjoining lymph nodes. In another experiment, the researchers treated mice with primary tumors before metastasis with iCluster, and a couple of days later, surgically removed their primary tumors, similar to what would be done for [cancer patients](#). About 40% of the treated mice were still alive 110 days later. That's in contrast to the untreated mice—all of them died from metastases within 51 days of surgery. Then, the team tested the therapy on mice that already had metastases. The iCluster-treated mice lived longer, and upon autopsy, had far fewer tumors than untreated mice.

**More information:** Jing Liu et al, Enhanced Primary Tumor

Penetration Facilitates Nanoparticle Draining into Lymph Nodes after Systemic Injection for Tumor Metastasis Inhibition, *ACS Nano* (2019).  
[DOI: 10.1021/acsnano.9b03472](https://doi.org/10.1021/acsnano.9b03472)

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