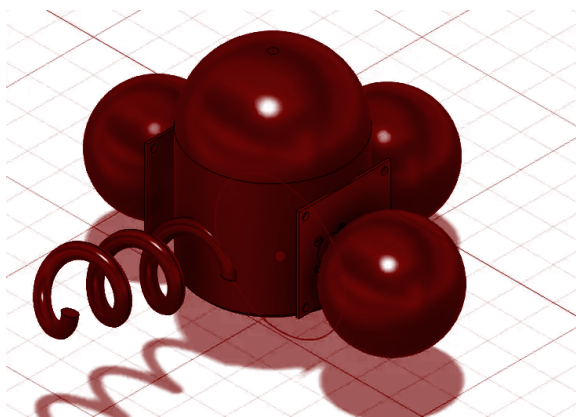


Precision Lymphocyte Chemotherapy with UCNPs



Lymphoma Treatment Through Photodynamic Nanocarriers

Photosensitizers are used as molecules that absorb light from a near-infrared radiation source which in turn facilitates an **ROS (radical oxygen) reaction**. This causes cell death in cancerous lymph tissues and mitigates their unique and complex immuno-multiplier effect without killing healthy white-blood cells and further damaging the immune system.

**We don't want a lose-lose situation.
Precision + Intensity Beats Precision.**

What's so Important About Lymphoma?

Photodynamic Therapy has improved the precision of killing lymph tumors. However, **Hodgkin lymph tumors** contain **Reed-Steering cells**, healthy B-cells that hamper the immune system's ability to fight infections, which weakens the body during chemotherapy. **PDT IS NOT STRONG ENOUGH TO ATTACK TUMORS BENEATH 1/3 INCH OF TISSUE**. The classic photosensitive treatment process becomes counterintuitive since chemotherapy is meant to reduce this multiplication effect, but the body isn't able to adjust to the spread of cancerous tissue due to the weakness of PDT.

Integrating UCNPs: How They Work

To target **Hodgkin lymphocytes** specifically, **upconversion nanoparticles (UCNPs)** pass near-infrared light and excite it to the frequency of UV light, to penetrate skin and target cancerous cells at high intensities, limited to within the vicinity of the lymphocyte, with around 70 times the energy absorbed.

PIONEERING NEW SOLUTIONS

Applying UCNP photon alterations to PS molecules:

- 1 Prevents lingering effects from the multiplication of Reed-Steering cells within a singular lymph node only.
- 2 Reduces the diffuse area on which energy from incident photons can scatter and damage healthy cells by optimizing the path of near-infrared light.

