



Theranostics: The Convergence of Therapy and Diagnostics in Precision Medicine

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Description

Theranostics is a rapidly growing field of medicine that combines diagnostic and therapeutic techniques to improve patient outcomes. It involves the use of imaging technologies to identify the precise location of a disease, followed by the targeted administration of therapy to that location. The concept of theranostics has gained significant attention in recent years, with the potential to revolutionize the way we treat many diseases, including cancer.

Theranostics is an approach to medicine that focuses on individualized treatment plans for patients. This approach recognizes that each patient's disease is unique and requires a personalized approach to treatment. By combining diagnostics and therapeutics, theranostics allows physicians to tailor treatments to individual patients, resulting in better outcomes and fewer side effects.

The most common application of theranostics is in the treatment of cancer. Traditional cancer treatments such as chemotherapy and radiation therapy are often non-specific and can damage healthy cells,

leading to severe side effects. With theranostics, however, targeted therapies can be delivered directly to cancer cells, resulting in more effective treatment with fewer side effects.

One of the key technologies used in theranostics is Positron Emission Tomography (PET) scanning. PET scanning involves the injection of a radioactive substance into the body, which is then absorbed by cancer cells. The radioactive substance emits positrons, which can be detected by a PET scanner. This allows physicians to identify the precise location of cancer cells in the body.

Once the cancer cells have been identified, targeted therapies can be administered directly to the affected area. This can be done in a number of ways, including the use of radioisotopes, which can be delivered directly to the cancer cells, killing them without damaging healthy tissue. Radioisotopes can also be used to deliver targeted doses of radiation to cancer cells, which can be more effective than traditional radiation therapy.

Another key technology used in theranostics is Magnetic Resonance Imaging (MRI). MRI uses powerful magnetic fields and radio waves to produce detailed images of the body. MRI can be used to identify the location of tumors and other abnormalities in the body, allowing physicians to target therapies directly to these areas.

In addition to cancer, theranostics is also being used to treat a wide range of other diseases, including cardiovascular disease, autoimmune disorders, and neurological disorders. For example, theranostics can be used to deliver targeted doses of medication to the heart, reducing the risk of side effects and improving outcomes in patients with heart disease.

One of the major advantages of theranostics is that it allows physicians to monitor the effectiveness of treatments in real-time. By using imaging technologies to track the progress of a disease, physicians can adjust treatment plans as needed, ensuring that patients receive the most effective therapies possible. This can lead to better outcomes and fewer side effects for patients.

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