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New biological soldiers called decoys

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Decoys are widely emerging in the field of nanotechnology as they are being used to cure diseases. They are nanoparticles that mimic the cells, tissues or organs of the host. They compete with the host cells to attach the pathogen or virus to themselves. Decoys further engulf the pathogens to protect the host cells and tissues. These particles are coated around the cells or tissues to be protected.

The use of decoys is a new approach that is being developed to fight autoimmune diseases. They are being used to mimic tissues and organs which need to be protected from the attack of autoimmune cells. The results are more promising than the conventional methods of treatment.

Further, decoys are being devised to be employed in ligand-receptor interactions. Toxins and infectious agents exploit these interactions to gain entry into the host, hence causing pathogenesis. Therefore, the decoys are modified to mimic the receptors to which the toxins and infection agents bind, further acting as a potential anti-toxin.

Similarly, exosome decoys are being studied in order to protect hosts against bacterial toxins such as staphylococcal enterotoxin B, which triggers the mass activity of T cells that give rise to a condition called toxic shock syndrome (TSS), which leads to physical impairment and death. Deeper insights into anti-toxin decoys could eliminate such horrendous conditions.

The advancement of decoys was accelerated when soluble CD4 was innovated to treat AIDS. The CD4 molecule has immunoglobulins attached to its outer portion which binds to HIV-1. These immunoglobulins are fused with a protein scaffold to act as a decoy.

Recently, amidst the COVID-19 pandemic, researchers have focused on creating nanosponges that could be a potential treatment for SARS CoV-2. Nanosponges are small pieces of plastic that are attached to the membrane of the lung cells, which together mimic the lungs. This way, the nanosponges attract the virus more quickly when compared to the actual lung cells. This crafty decoy then engulfs the virus and minimises the impact on the lungs. This treatment works even on late-stage COVID patients. The mass production and commercialisation of decoys can save millions of people who suffer from diseases that currently do not have a cure. Additionally, they can replace costly therapies and medicines owing to their rapidity and ease of production.

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