Biomedical

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Anti-Viral Activity of Formally Substitution-inert Coordination Compounds

The Modulation of Glycan Targeting

Human cytomegalovirus (HCMV), a member of the herpesvirus family, is a double-stranded DNA virus that infects approximately 60% of individuals in developed countries and nearly 100% of individuals in developing countries. HCMV causes significant disease in immunocompromised patients, such as transplant patients, and is the major infectious cause of birth defects when acquired congenitally. Transplant patients with the infection are most at risk for severe morbidity and current strategies to avoid HCMV disease include the use of prophylactic or pre-emptive therapy and antiviral therapies, such as ganciclovir and letermovir. These therapies are inadequate due to severe toxicities and emergence of single and multidrug-resistant strains; thus, there is an urgent need for improved therapeutic options.

The technology

Inventors at Virginia Commonwealth University have discovered a new approach to interfere with the Heparan Sulfate Proteoglycan (HSPG) receptor mechanism for viral entry. This interference leads to significant *in vitro* anti-viral activity for formally substitution-inert charged coordination compounds. Through the manipulation of structure and charge of positively charged, formally substation-inert coordination compounds, glycan function can be modulated. For instance, the inventors tested their approach against HCMV by using positively charged compounds (DiplatinNC (DiPtNC), TriplatinNC (TriPtNC), and Werner's Complex (WC)) to inhibit the viral entry by neutralizing the negative charges of the cell surface glycosaminoglycans. This resulted in significant selective antiviral activity against HCMV with correspondingly low toxicity.

Benefits

- Selective antiviral activity
- Protects the substrate itself from protein recognition
- High selectivity index
- Low toxicity

Applications

- Preventative antiviral activity therapy against HCMV and other herpes viruses, HIV, and Zika viruses
- Interfere with the HSPG receptor mechanism for viral entry
- Modulate GAG function

Patent status:
Patent pending: U.S. and foreign rights are available.

License status:
This technology is available for licensing to industry for further development and commercialization.

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