Synthesis and Characterization of Platinum Anticancer Compound Oxalato (1,4-dimethylpiperzine) Platinum(II)

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Cisplatin is a platinum-based chemotherapy drug that targets breast cancer, head and neck cancer, lung cancer and testicular cancer. It is found to be very effective in treating testicular cancer with a maximum success rate of up to 85%. This research involves the synthesis and characterization of a compound that is structurally similar to cisplatin, oxalato(1,4-dimethylpiperzine)platinum(II). The structural differences from the original cisplatin compound can lead to a preference for DNA targets over the more abundant but less active protein targets. The compound has a piperazine ring that forces the methyl groups to be directly in the platinum coordination plane, unique from other compounds our lab has studied. This compound was made to be more water-soluble by replacing chloride with oxalate. The reactivity of this compound was tested with readily available biomolecules methionine and guanosine monophosphate (GMP), which are the primary protein and DNA targets for platinum compounds. Moving forward, the compound will eventually be tested for toxicity in cancer cell lines.

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