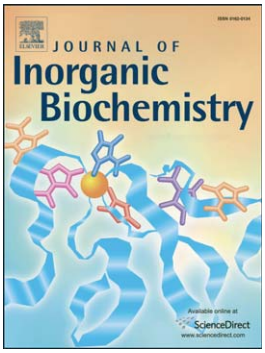

Selective speciation improves efficacy and lower toxicity of platinum anticancer and vanadium antidiabetic drugs

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Selective speciation improves efficacy and lower toxicity of platinum anticancer and vanadium antidiabetic drugs

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Abstract (245 words and 250 words allowed)

Improving efficacy and lowering resistance of drugs can be addressed by consideration of the coordination complex speciation and key reactions important to vanadium drugs and platinum drugs under biological conditions. The methods of analyses vary depending on the specific metal ion chemistry. The vanadium compounds interconvert readily, whereas the reactions of the platinum compounds are much slower and thus much easier to study. However, the vanadium species are readily differentiated because of different colors. For both vanadium and platinum systems the importance of understanding the processes as the compounds enter cells is needed to better combat the disease. There are many nucleophiles present in the cytoplasm, which are critical for these drugs because the processing is important to the efficacy of the drugs. Examples of two formulations of platinum compounds illustrate how changing the chemistry of the platinum will result in less toxic and better tolerated drugs. The consequence of the much lower toxicity of the drug, can be readily realized because cisplatin administration requires hospital stay where as Lipoplatin can be done in an outpatient manner. Similarly, the properties of Satraplatin allow for development of an oral drug. These forms of platinum demonstrate that the direct consequence of more selective speciation is lower side effects and cheaper administration of the anticancer agent. Therefore we urge that as the community goes forward in development of new drugs, control of speciation chemistry will be considered as one of the key strategies in the future development of anticancer drugs.