

The choice of a tridentate ligand may also be of some significance; note that in the VO^{2+} complexes of tetradentate nitrilotriacetic acid or pyridine-methylimino-diacetic acid the apical site *trans* to oxygen is blocked by the nitrogen atom of the iminodiacetic moiety and substitution rates of reaction are much smaller [11]. In these conditions it is likely that "amavadine" is indeed "unique" for its function, but it is still not clear what kind of function it performs.

ACKNOWLEDGEMENTS

The authors thank Prof. F.M. Catarino from the Faculty of Sciences of Lisbon and his collaborators for providing us with specimens of *Amanita muscaria*.

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PS7.8 — MO

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METAL IONS AND THEIR INTERACTIONS WITH BIOLOGICAL FLUIDS: SPECIATION OF TRACE METALS IN SALIVA

It is now well appreciated that the biological action of a therapeutic agent is governed by the dynamic equilibrium of complexes involving that agent and the biological medium in which it acts. Thus, the *in vivo* chemical speciation of a transition metal based agent or a chelating agent may be different from the form in which it is administered due to complexation of endogenous ligands or metals in the biological fluid. Studies of the mode of action of gold compounds for the treatment of arthritis have recently been reported to be complicated by such biological interactions [1].

In order to understand the factors which control the efficacy of a particular agent, it is important to establish the coordination chemistry of this agent in the biological environment in which it acts and how this is affected by the addition of exogenous species. Unfortunately, it is rarely possible to measure directly the concentration of a metal or a ligand in a particular species in such complex media. Rather, it is often only possible to measure the total concentration of the metal or ligand, respectively.

It is, therefore, necessary to use indirect methodology to determine the chemical speciation of such systems. Recent technical advances in potentiome-

tric data collection and analyses enable precise, accurate formation constants to be routinely measured. These constants, together with sophisticated computer modelling techniques, allow one to compute metal-ligand species distributions in complex systems [2]. Such techniques have been used successfully to elucidate the principles governing the efficacy of copper salicylate, for example [3]. We are currently interested in the mode of action of active agents present in dentifrices, for example, zinc salts in the reduction of the growth of plaque [4]. As these agents exhibit their biological activity in the oral environment, their interaction with the components of saliva is of prime importance. As a first step in establishing the factors which determine the clinical efficacy of these agents, we have used the computer modelling technique to determine the distribution of trace metals amongst the organic ligands in saliva. The poster will present details of this model together with a collation of data concerning the composition of saliva and relevant binding equilibria. Concentration effects for the various components will be demonstrated and the "important" endogenous ligands will, thus, be identified.

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PS7.9 — TU

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STUDIES ON THE BIOCHEMICAL ACTIVITY OF SELENOCARRAGEENAN

The preparation and biochemical activity of selenocarrageenan are described. The results indicate that, for male mice, the supplementation of the diet with kappa-selenocarrageenan results in significantly higher biological availability and physiological effects than the supplementation with Na_2SeO_3 . The concentration of Se in whole blood, the glutathione peroxidase enzyme activity and the hemoglobin content increase by 23%, 13% and 22%, respectively with kappa-selenocarrageenan. The ability to prevent H_2O_2 and free radicals attack to the red cells also increases by 50% and 55% respectively.