

**S009** (Bio)molecule mineral interactions for (bio)technological applications

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Interactions between inorganic materials and biomolecules at the molecular level, although complex, are commonplace. Examples include biominerals, which are, in most cases, facilitated by and in contact with biomolecules; implantable biomaterials; and food and drug handling. The effectiveness of these functional materials is dependent on the interfacial properties i.e. the extent of molecular level 'association' with biomolecules. This presentation will present information on biomolecule-inorganic materials interactions and our current understanding using selected examples. The examples may include (1) polyamine-silica interactions to generate porous and non-porous materials (2) peptide mediated crystal formation, (3) peptide binding to amorphous particles and (4) protein binding to surfaces with defined chemistry and topography. A wide range of experimental techniques (microscopic, spectroscopic, particle sizing, thermal methods and solution methods) are used by the research group to study interactions between (bio)molecules and molecular and colloidal species that are coupled with computational simulation studies to gain as much information on the molecular scale interactions.

Our goal is to uncover the mechanisms underpinning any interactions and to identify 'rules' or 'guiding principles' that could be used to explain and hence predict behaviour for a wide range of (bio)molecule-mineral systems.