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## Investigation of protein stability and activity in Ionic liquids (IL) to control 3D Structure and Function of Simple and Complex Biomolecules in a quantitative and systematic manner.

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Ionic liquids (ILs) can have a stabilizing or destabilizing effect on proteins, which is strongly dependent on the cation and anion of the IL (1). Consequently ILs have potential to be tailored as beneficial solvents for enzymatic reactions and protein storage. The aim here is to develop detailed structure-property relationships between protic ionic liquid cations and anions and their ability to stabilize proteins. This will advance our understanding of specific solvent properties on protein stability, such as cation, anion, ionic strength, salt concentration and pH. The understanding of protein stability and function in ionic liquids will be advanced through employing an approach which builds molecular complexity from simple amino acids to multiple amino acids connected by peptide (bonds) to proteins (2). The proteins of primary interest to this project are water soluble proteins, which are also enzymes, whose functionality is dependent on their 3-D structure. The quantitative approach will enable direct comparison of protein properties between these IL and IL-water solvents in conventional aqueous systems.

### References

- (1) Attri, P.; Venkatesu, P. Thermodynamic characterization of the biocompatible ionic liquid effects on protein model compounds and their functional groups. *Phys. Chem. Chem. Phys.* 2011, 13, 6566.
- (2) Patel, R.; Kumari, M.; Khan, A. B. Recent Advances in the Applications of Ionic Liquids in Protein Stability and Activity: A Review. *Applied Biochemistry and Biotechnology* 2014, 172, 3701.

### Keywords or phrases (comma separated)

#### Are you a student?

Yes

#### Do you wish to take part in the Student Poster Slam?

No

#### Are you an ECR? (<5 yrs since PhD/Masters)

No

## What is your gender?

Female

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