Structural elucidation and biophysical characterization of Retinol Binding Protein 3

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Retinol Binding Protein 3 (RBP3) is a soluble protein localized in the interphotoreceptor matrix (IPM) [1]. The role of RBP3 in the interphotoreceptor matrix is still under debate; however, it is now clear this protein plays a role in the shuttling of retinoids between the photoreceptors and the Retinal Pigmented Epithelium (RPE) [2]. Mammalian RBP3 is a single glycosylated peptide chain of around 1325 amino acids, the gene encoding this protein has undergone a quadruplication event, and, for this reason, is possible to identify within the peptide chain four homologous modules consisting of ~300 amino acids each [3]. The high flexibility of this protein is the major obstacle to full-length, high-resolution, structure determination [4]. So far, there are only X-ray crystallography structures of non-mammalian single modules and one Cryo-Electron Microscopy (Cryo-EM) structure determined for the full-length bovine protein at a resolution of 6-7 Å [5,6,7]. Here we use crystallography (Figure 1A) and Cryo-EM (Figure 1B) to determine the structure of the Module 4 and the structure of the full-length protein [8]. The effects induced by the ligand binding are analysed through Small Angle X-ray Scattering technique (Figure 1C) [8].

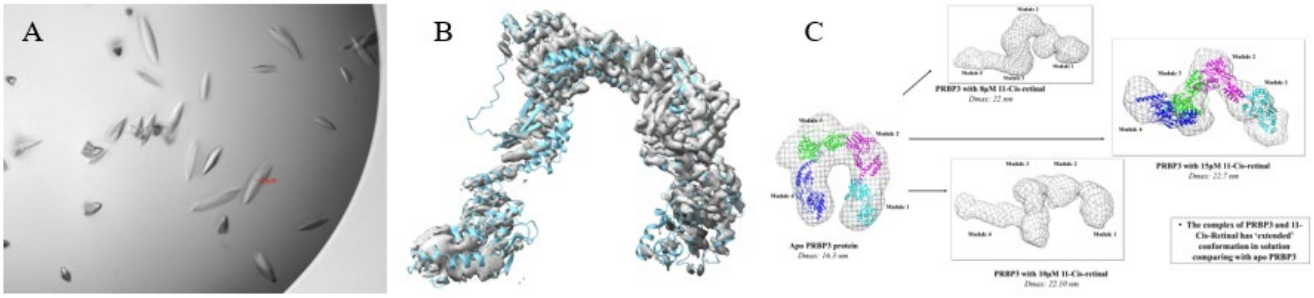

Figure 1. A) Crystals of *Sus scrofa* RBP Module 4. B) AB initio model of *Sus scrofa* full length RBP3. C) Conformational changes of *Sus scrofa* RBP3 induced by ligand binding.

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