

16th International Conference and Exhibition on

Pharmaceutical Formulations

July 26-27, 2018 | Rome, Italy

Thermal stability of recombinant human interleukins-1 receptor antagonist

Amal Abukharies

University of Manchester, UK

Introduction: rhIL-1Ra is a recombinant form of the natural anti-inflammatory mediator, interleukin-1 receptor antagonist that competitively binds with type I receptors (IL-1RI). It inhibits effects of other inflammatory mediator, interleukin -1 (IL-1). However, the rhIL-1Ra has tendency to aggregate at high temperatures and is hence stored at 2°C to 8°C.

Aim: The overall project aim is to study thermal stability of the rhIL-1Ra and investigate changes in the secondary structures within the nucleation phase. This may provide clues to reduce the rate of aggregation of protein.

Methods: Initially, visual inspection (photographs) was made following the incubation of rhIL-1Ra at 37°C. Then, the aggregation was followed quantitatively by recording changes in the optical density. A more sensitive technique was also used to follow aggregation in the nucleation phase, where sub-visible particles may exist, using particle sizing. The formation of non-native β -structure of the protein was followed by use fluorescence spectroscopy using Thioflavin T (THT). Attempts were also made, using circular dichroism (CD), to assess any induced changes in the secondary structure of the protein induced thermally.

Results & Conclusions: Our study suggests that rhIL-1Ra has visible signs of cloudiness within 6 hrs at 37°C. When this is followed by light scattering over 24 hrs period a number of kinetic phases due to aggregation were observed starting with a nucleation phase where changes in particle size were observed. Protein assay indicated a trace amount of rhIL-1Ra was aggregated. Fluorescence assay in particular the Thioflavin T, and CD spectrum results provide earlier indication of formation of non-native beta structures.

Biography

Amal Abukharies is currently pursuing her PhD in Pharmacy and Pharmaceutical Sciences at the University of Manchester, England. She has published more than 5 papers in international journals.

amal.abukharies@manchester.ac.uk

Notes: