המחלקה
לכימיה
הפקולטה למדעים מדויקים
אוניברסיטת בר־אילן

The Department of Chemistry Special Seminar

Tuesday 28/12/21 11:00 am

Room 112, Building 211

On the “Serum amyloid A in lipid transport, inflammation, and amyloid disease: an ancient protein that wears hydrophobicity on its sleeve”

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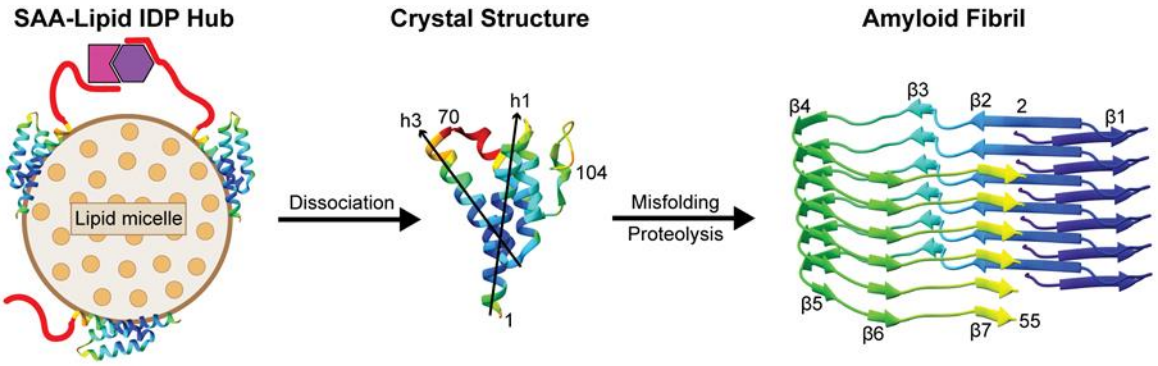
Boston University School of Medicine

Abstract Serum amyloid A (SAA) is an ancient enigmatic biomarker of inflammation and a protein precursor of AA amyloidosis, a life-threatening complication of chronic inflammation. The levels of this small soluble intrinsically disordered protein increase rapidly and dramatically up to 1,000-fold in blood following inflammation, infection or injury. The advantage for survival of this steep but transient increase is unclear, and the beneficial role of SAA in immune response is obscure. However, evolutionarily conserved aspects of the SAA structure, the rapid and major commitment of liver to its generation in acute phase response, and its lipophilic character indicate the vital role of SAA-lipid interactions. Our studies use a wide array of structural and biochemical methods to reveal a new role for SAA in clearing cellular membrane debris from the injured sites. We propose that SAA acts as a lipid scavenger and an intrinsically disordered protein hub in the inflammation control. We also explore molecular mechanism of SAA misfolding in AA amyloidosis, a major form of systemic amyloid disease in animals and humans. Together, these studies help establish raison d’etre for this enigmatic Cambrian protein, provide a molecular basis for its action in immune response and lipid homeostasis, and help find much-needed therapies for a life-threatening human disease.


SAA-Lipid IDP Hub
Crystal Structure
Amyloid Fibril
Lipid micelle
Dissociation
h3
70
h1
104
1
Misfolding
Proteolysis
β4
β3
β2
2
β1
β5
β6
β7
55