
Tentative Outline

Special Thematic Issue for Protein and Peptide Letters

Title of the Thematic Issue: Advances in Research of Tandem Repeat-Containing Proteins

Guest Editor's Name: Dr. Norio Matsushima

Scope of the Thematic Issue:

An array of protein tandem repeats is defined as several adjacent copies having the same or similar sequence motifs. The repeat number ranges from two to greater than 100. The repeat unit length ranges from single amino acid to amino acid sequence longer than 100 residues. It presents in proteins from viruses to eukaryotes. Human genome. Nearly 20% of the proteins encoded by the human genome contain multiple repeated units of 30–40 amino acids often occurring in tandem arrays referred.

Computational software run to find, characterize and annotate protein tandem repeats. Databases of structural repeats in proteins are available. However, the true character of tandem repeats in proteins is not certain still, because the research of the structure, functions, and evolution of tandem repeats are getting less research done than tandem repeats identified or annotated.

Tandem repeats in proteins may be grouped into two classes. In one class repeat unit form a globular structure, while in the other class the repeat unit forms a non-globular structure. In this special issue I focus non-globular tandem repeats. The examples are leucine rich repeat (LRR), ankyrin repeat, tandem repeats in ice nucleation proteins, polyglutamine, spider silk, mussel glue proteins, RNA polymerase II CTD, and the histone H1-like protein AlgP.

The goal of this Special Issue is to get a deep understanding of the correlations between sequence, structure, functions, ligand interactions, and evolution of tandem-repeat containing proteins and the tandem repeat itself (which may be obtained by peptide synthesis). I welcome all research of biochemistry, protein science, molecular biology, and bioinformatics. Moreover, I welcome the research of materials science of designed tandem repeat. Original scientific reports, review articles, commentary, perspective, and opinion papers are accepted.

Keywords: Tandem Repeat; Non-globular structure; Function, Ligand interaction; Synthesized peptides; Leucine rich repeat; Ice nucleation protein; spider silk.

Sub-topics:

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The sub-topics covered within the issue are:

- Database of tandem repeat proteins.
- Structure and functions of tandem repeats of short peptide sequences
- Synthesized mimetic tandem repeat including tandem repeats in mussel glue proteins
- Structure and function of polyglutamine
- Phosphorylation, copper binding, and function of RNA polymerase II CTD
- Structure of tandem repeats in spider silk
- Structure and functions of ice-nucleation proteins and antifreeze proteins
- Structure and functions of wheat glutenin

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- Sequence, structure, and ligand interactions of leucine rich repeats proteins
 - Intrinsic disorder in tandem repeat proteins
 - Tandem repeats in the histone H1-like protein AlgP, prion and anklyrin

Tentative titles of the articles and list of contributors:

1. The Carboxyl-Terminal Penta-Peptide Repeats of Major Royal Jelly Protein 3.
2. Hydration-induced structural transitions in biomimetic tandem repeat proteins.
3. Insights into the aggregation mechanism of PolyQ proteins with different glutamine repeat lengths.
4. Molecular interactions contributing to FUS SYGQ LC-RGG phase separation and co-partitioning with RNA polymerase II heptads.
5. Composition and in silico structural analysis of fibroin from liquid silk of non-mulberry silkworm *Antheraea Assamensis*.
6. Homochiral and racemic MicroED structures of a peptide repeat from the ice-nucleation protein InaZ.
7. Viscoelastic properties of wheat gluten in a molecular dynamics study.
8. Pediatric dilated cardiomyopathy-associated LRRC10 (Leucine-Rich Repeat-Containing 10) variant reveals LRRC10 as an auxiliary subunit of cardiac L-Type Ca(2+) channels.
9. Tandem repeats in giant archaeal Borg elements undergo rapid evolution and create new intrinsically disordered regions in proteins.
10. The histone H1-like protein AlgP facilitates even spacing of polyphosphate granules in *Pseudomonas Aeruginos*.

Schedule:

- ✧ Thematic issue submission deadline: 31st October 2023.

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