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Elucidation of the Exquisite Anti-T Specificity of *Artocarpus integrifolia* Lectin and the Subunit Heterogeneity in Molecule by A. Surolia, *Molecular Biophysics Unit, Indian Institute of Science, Bangalore 560 012, India.*

The Thomsen-Friedenreich (T) antigen is a tumor associated antigen of non-oncofetal origin and is probably one of the few chemically well-defined antigens with a proven link to malignancy; therefore, anti-T probes have enormous potentials in cancer research. Thermodynamic analysis of ligand binding to *Artocarpus* lectin together with their minimum energy conformations has shown that this lectin is highly specific for T-antigen (Galβ1→ 3GalNAc) and fails to recognize conformationally-related disaccharides such as lactose, N-acetyllactosamine and Galβ1→ 3GlcNAc. One of the unusual features of the lectin is that it has strong affinity for both MeαGal and MeαGalNAc, like the lectins specific for blood group A and B determinants respectively, yet it displays a remarkable specificity for binding to the T-hapten. Further studies were undertaken to resolve this dilemma and define its sugar specificity in considerable detail. Despite its strong affinity for MeαGalNAc and MeαGal, our studies have revealed that the lectin binds very poorly when galactose and GalNAc are in α-linkage with other sugars in A and B blood group determinants due to unfavourable steric interaction between the lectin and the sugars distal to α-linked Gal or GalNAc. It binds to Galβ1→ 3GalNAcαMe with 300 fold affinity over Galβ1→ 3GalNacβMe and fails to recognize asialo-GM1 oligosaccharides. Its exquisite specificity for T-antigen together with its virtual non-binding to Galβ1→ 3GalNAcβMe and asialo-GM1 should make *Artocarpus* lectin a valuable probe for monitoring the expression of T-antigen on the cell-surfaces.

Contrary to an earlier report, our SDS-urea polyacrylamide gels show two distinct bands for the lectin with Mr. 9500 (A subunit) and 10,200 (B subunit) respectively, hence the tetrameric lectin from *Artocarpus* is made of two pairs of non-identical subunits. Our preliminary sequencing studies on the native protein at each cycle gave atleast two distinct PTH amino acids. We, therefore, faced considerable difficulty in separating these subunits for sequence analysis by conventional methods. Isoelectric focussing of the native protein revealed several iso-lectin forms making sequencing task even more daunting. We were, however, able to resolve the peptides in the *Artocarpus* lectin by reverse phase HPLC with 1% TFA-Acetonitrile gradient in 7 distinct fractions to homogeneity. These results further confirm the occurrence of distinct types of subunits in the lectin. We have successfully sequenced more than 25 amino acids from the N-terminus of both types of subunits. Efforts to completely sequence the protein molecule are under progress.

Emerging Concepts in Fluorosis Research by A. K. Susheela, Kamal Sharma and T. K. Das, *Department of Anatomy, All India Institute of Medical Sciences, New Delhi 110 029, India.*

Dental and skeletal fluorosis is a serious health problem in 13 states of India. The main cause of the health problem being ingestion/inhalation of fluoride in excess through water, food, toothpaste, drugs and air (in industrial environment).

In dental fluorosis, the teeth get discoloured, culminate in brown and black teeth with pitting, perforation and get chipped off. Dental fluorosis is known to cause cosmetic and social problems. In skeletal fluorosis, the clinical manifestations begin with pain in the neck, back-bone, hip region, joints and culminate in stiff, immobile and painful joints. Paralysis is common occurrence in late stages and those afflicted have no alternative but to lead a vegetative life.

The pathological changes observed in the bone and dental tissues of fluorosed human patients have been explained at least partly by alterations in the organic matrix of these tissues. These alterations include increased ratio of iduronic acid to glucuronic acid containing sulphated isomers of glycosaminoglycans, reduction in their molecular weight and increased charge density. This, along with reduced cortisol levels leading to abnormal calcium metabolism have been implicated in causing cartilagenous (demineralized) loci formation in bone, mottling and pitting in dental tissues.

Susceptability to fluorosis is known to vary; it has been found to be determined by pre-existing inflammation, marked by increased serum haptoglobin levels. Those afflicted with skeletal fluorosis have high haptoglobin levels. Those who are residing in endemic areas for fluorosis and ingesting