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Non-Confidential Description - PSU No. 4463
"Novel Lectins from Tree Root Transcriptome Samples"

Keywords:
Lectin, cDNA library, Snowdrop lectin, Galanthus nivalis lectin

Links:
Inventor website

Inventors:
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Background
Lectins bind to a soluble carbohydrate or carbohydrate moiety that is part of a glycoprotein or glycolipid. Glycolipids as components of cellular membranes and/or extracellular matrix, affect interactions between cells and their external environment. As a result of this binding and associated effects, lectins manifest activities including antitumor, immunomodulatory, antifungal, anti-viral, and anti-insect activities, which often find practical applications. Existing commercial uses include applications in biotechnology (e.g. glycomics, lectin arrays) and biomedicine (blood typing, flow cytometry). Since glycan-mediated cell interactions are generally associated with pathological processes, evaluating lectins for their medical potential is a growing field and likely to yield results of societal and economic importance. Discovery and characterization of new lectins at a genetic level, followed by cloning and purification, may contribute to the development of new tools to identify changes in protein glycosylation, subsequently leading to a better understanding of lectin biology and to powerful therapies and diagnostic tools.

Invention Description
The present invention provides compositions comprising 85 novel lectins isolated from tropical plant root transcriptomes. Orthology analyses indicate that they are not plant genes; they are more likely from root-associated fungi. The cDNA (and peptide) library of lectins is described, ready for purification (in milligram [mg] to gram [g] quantities) and screening for function and application. The proof of concept provides evidence to antifungal capabilities of at least one of the lectins.

Advantages/Applications
- Graft-vs-host disease
- Therapeutic application both as a drug and/or drug adjuvant/carrier
- Diagnostic for dysregulation of glycoprotein associated conditions/diseases.
- Cancer biomarker discovery and diagnostic
- Anti-viral, anti-fungal, antibacterial properties (topical and systemic therapeutic applications)
- Fractionation of biological fluids
- Dialysis filtration column.
- Lectin arrays for glycomic applications
- Research tool
- Protecting plant from pathogen – fungicide, pesticide, insecticide
- Transgenic plants method for inhibiting the growth of a pathogen, fungus, bacterium or virus

Published patents/publications
Provisional patent application filed May 2016.

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