



EXPERTS ON CHLORELLA AND ANTIDIABETIC EFFECTS

(Scientific studies listed below are not Cross Verified by Abca BioSolutions Pvt. Ltd.)

THE EFFECT OF CHLORELLA ON GLYCEMIC CONTROL OF DIABETES BY CARDINAL TIEN HOSPITAL.

Chlorella, A Type Of Unicellular Fresh Water Algae, Has Been A Popular Foodstuff In Asia, Especially In Taiwan. Recent Studies Have Shown The Hypoglycemic Effects Of Chlorella Through Increasing Glucose Uptake In The Liver And Muscle, Lowering Serum Free Fatty Acid Levels, Or Activation Of PPAR Gamma Receptor. However, The Hypoglycemic Effect In Diabetic Patients Have Not Been Studied. In Order To Clarify The Hypoglycemic Effects And Mechanism Of Chlorella In Diabetic Patients, The Investigators Conducted A 12-Week Randomized, Double-Blind, Placebo-Control Trial On Diabetic Patients.

[Verified February 2011 By US National Library of Medicine, Clinical Trials](#)

THE INHIBITORY EFFECTS OF THE GREEN ALGA CHLORELLA PYRENOIDOSA AGAINST KEY ENZYMES RELEVANT FOR TYPE-2 DIABETES

The Inhibitory Effects Of The Green Alga Chlorella Pyrenoidosa Against Key Enzymes Relevant For Type-2 Diabetes Were Reported For The First Time In The Present Work. The Alga Exerted Its Anti-Diabetic Actions By Scavenging Free Radicals And/OR Chelating Transition Metals But Not By Suppressing Reactive Carbonyl Species. The Findings Strongly Supported The Benefits Of Microalgae As Functional Foods In The Prevention And Alleviation Of Diabetes.

[Evaluation of the Green Alga Chlorella pyrenoidosa for Management of Diabetes. By Sun Z, Chen F., J Food Drug Anal. 2012\(Suppl\); 20:246-249.](#)

PANCREAS-PROTECTIVE EFFECTS OF CHLORELLA IN STZ-INDUCED DIABETIC ANIMAL MODEL: INSIGHTS INTO THE MECHANISM

A Significant ($P < 0.05$) Reduction Of Blood Glucose Level In Diabetic Chlorella-Treated Rats Was Observed Compared To Diabetic Untreated. Chlorella Increased The Number Of Glutathione-Positive Cell In Diabetic Rats Compared To Untreated Diabetics. Chlorella Administration Increased The Percentage Of Insulin Secreting Pancreatic Beta Cells Both In Normal And Diabetic Treated Rats. The Present Results Suggest That Chlorella May Play An Important Role In Improving The Overall Condition Of Diabetic Patients And Delay Its Complication By Restoring The Function Of Pancreatic Insulin-Secreting Cells.

[Pancreas-protective effects of chlorella in STZ-induced diabetic animal model: insights into the mechanism By Amr Amin and Co-Workers, Journal of Diabetes Mellitus, \(2011\) Vol.1, No.3, 36-45.](#)

PROTECTIVE ACTIONS OF MICROALGAE AGAINST ENDOGENOUS AND EXOGENOUS ADVANCED GLYCATION ENDPRODUCTS (AGES) IN HUMAN RETINAL PIGMENT EPITHELIAL CELLS

Results Showed That In Cultured Human-Derived Retinal Pigment Epithelial ARPE-19 Cells, The Extract Of *Chlorella zofingiensis* And Its Nutritional Ingredient Astaxanthin Exhibited Significant Inhibitory Effects On The Formation Of Endogenous N³-Carboxymethyllysine (CML), A Key AGE Representative, Through The Suppression Of Intracellular Oxidative Stress. These Results Suggested The Positive Roles Of Astaxanthin, Lutein And EPA In Controlling The Development Of Diabetes. These Microalgae, Therefore, Might Be Regarded As Beneficial Foods And Preventive Agent Choices For Patients With Diabetic

[Protective actions of microalgae against endogenous and exogenous advanced glycation endproducts \(AGEs\) in human retinal pigment epithelial cells By Zheng Sun and Co-Workers. Food Funct., 2011, 2, 251 *Chlorella pyrenoidosa* for management of diabetes. By Sun Z, Chen F., J Food Drug Anal. 2012\(Suppl\); 20:246-249.,](#)

CHLORELLA PROTECTS AGAINST HYDROGEN PEROXIDE-INDUCED PANCREATIC B-CELL DAMAGE

They Investigated The Protective Effects Of *Chlorella* On H₂O₂-Induced Oxidative Damage In INS-1 (832/13) Cells. *Chlorella* Partially Restored Cell Viability After H₂O₂ Toxicity. To Further Investigate The Effects Of *Chlorella* On Mitochondria Function And Cellular Oxidative Stress, We Analyzed Mitochondria Membrane Potential, ATP Concentrations, And Cellular Levels Of Reactive Oxygen Species (ROS). *Chlorella* Prevented Mitochondria Disruption And Maintained Cellular ATP Levels After H₂O₂ Toxicity. It Also Normalized Intracellular Levels Of ROS To That Of Control In The Presence Of H₂O₂. *Chlorella* Should Be Studied For Use In The Prevention Or Treatment Of Diabetes.

[Chlorella Protects Against Hydrogen Peroxide-Induced Pancreatic b-Cell Damage by Chia-Yu Lin and Co-Workers \(2014\) J Med Food 17 \(12\) , 1-8](#)

THE EFFECT OF CHLORELLA VULGARIS SUPPLEMENTATION ON LIVER ENZYMES, SERUM GLUCOSE AND LIPID PROFILE IN PATIENTS WITH NON-ALCOHOLIC FATTY LIVER DISEASE BY MEHRANGIZ EBRAHIMI-MAMEGHANI

Weight, Liver Enzymes, Fasting Blood Sugar (FBS) And Lipid Profile Decreased Significantly In Both Groups (P<0.05). The Differences In Weight, ALP And FBS Between The Two Groups Were Statistically Significant (P=0.01, P=0.04 And P=0.02, Respectively). Conclusion: *C. vulgaris* Seems To Improve FBS And Lipid Profile And Therefore Could Be Considered As An Effective Complementary Treatment In NAFLD.

[The Effect of Chlorella vulgaris Supplementation on Liver Enzymes, Serum Glucose and Lipid Profile in Patients with Non-Alcoholic Fatty Liver Disease by Mehrangiz Ebrahimi-Mameghani and Co-Workers \(2014\) Health Promotion Perspectives, 4\(1\), 107-115.](#)

CHLORELLA INGESTION SUPPRESSES RESISTIN AND RELATED GENES' EXPRESSION IN PERIPHERAL BLOOD CELLS OF BORDERLINE DIABETICS

A Total Of 252 Genes Showed Changed Expression Levels Between These Two Groups. Six Of These Were Type 2 Diabetes-Associated Genes, Including Resistin, An Insulin Resistance Inducer That Exhibited Markedly Reduced Expression With *Chlorella* Ingestion (P $\frac{1}{4}$ 0.01). Resistin mRNA Expression Significantly Correlated With Changes In HbA_{1c} And TNF-A And IL-6 Levels, All Of Which Are Strongly Associated With Glucose Metabolism And/Or Inflammation.

[Chlorella ingestion suppresses resistin and related genes' expression in peripheral blood cells of borderline diabetics by Hiroshige Itakura and Co-Workers \(2015\) Clinical Nutrition ESPEN 10 e95-e101.](#)

THERAPEUTIC POTENTIALS OF UNICELLULAR GREEN ALGA CHLORELLA IN ADVANCED GLYCATION END PRODUCT (AGE)-RELATED DISORDERS

We Have Recently Found That Unicellular Green Alga Chlorella Inhibited The Formation Of AGEs In Vitro. Since Several Lines Of Evidence Have Shown Anti-Atherogenic Effects Of Chlorella On Animal Models, We Hypothesize Here That The Beneficial Aspects Of Chlorella On Atherosclerosis Could Be Ascribed, At Least In Part, To Its AGE Inhibitory Property And That Chlorella May Have Therapeutic Potentials In Treatment Of Patients With Other AGErelated Disorders Such As Diabetic Microangiopathy And Alzheimer's Disease.

[Therapeutic potentials of unicellular green alga Chlorella in advanced glycation end product \(AGE\)-related disorders by S. Yamagishi and Co-Workers \(2005\) 65, 953-955](#)

INHIBITORY EFFECTS OF MICROALGAL EXTRACTS ON THE FORMATION OF ADVANCED GLYCATION ENDPRODUCTS (AGES)

Sun And Co-Workers evaluated the Anti-Glycation Activities Of 20 Microalgae During Different Growth Phases. The Green Microalgae Chlorella Sp. And Diatom Nitzschia Laevis Exhibited The Highest Inhibitory Effects Against The Formation Of Total AGEs, Especially Pentosidine And N"-Carboxymethyllysine.

[Inhibitory effects of microalgal extracts on the formation of advanced glycation endproducts \(AGEs\) by Sun, Z and Co-Workers \(2010\) Food Chem. 120, 261-267.](#)