

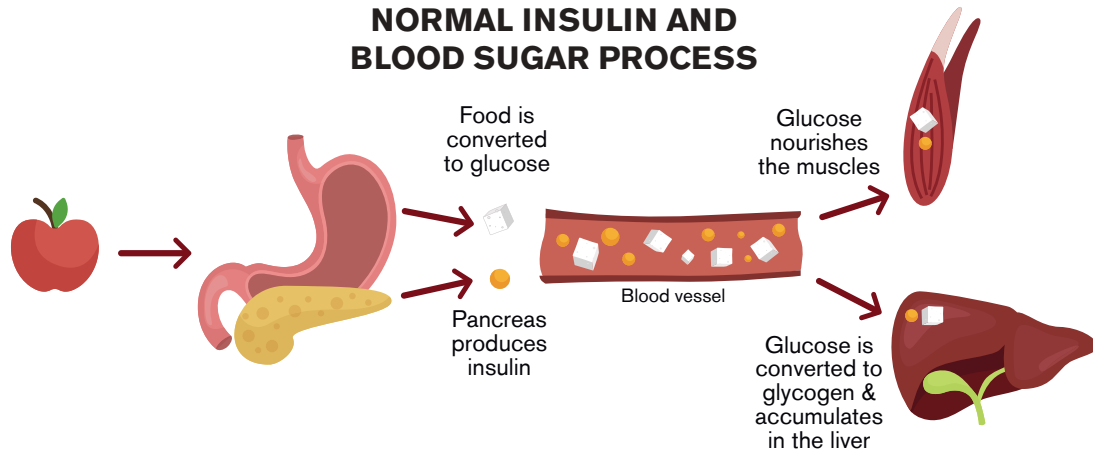
DR.VEGAN[®]

Oh Sugar!

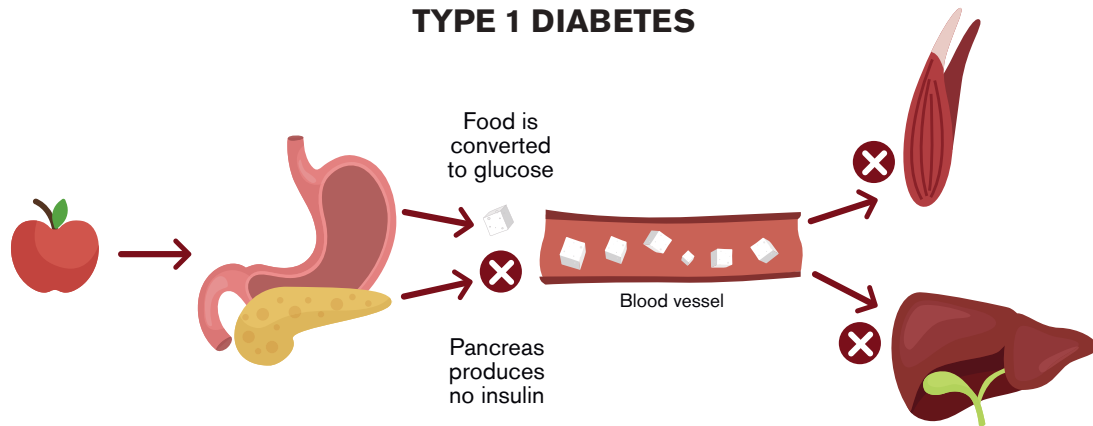
*Strategies for insulin resistance
and blood sugar control*

Practitioner Toolkit • *For practitioner use only*

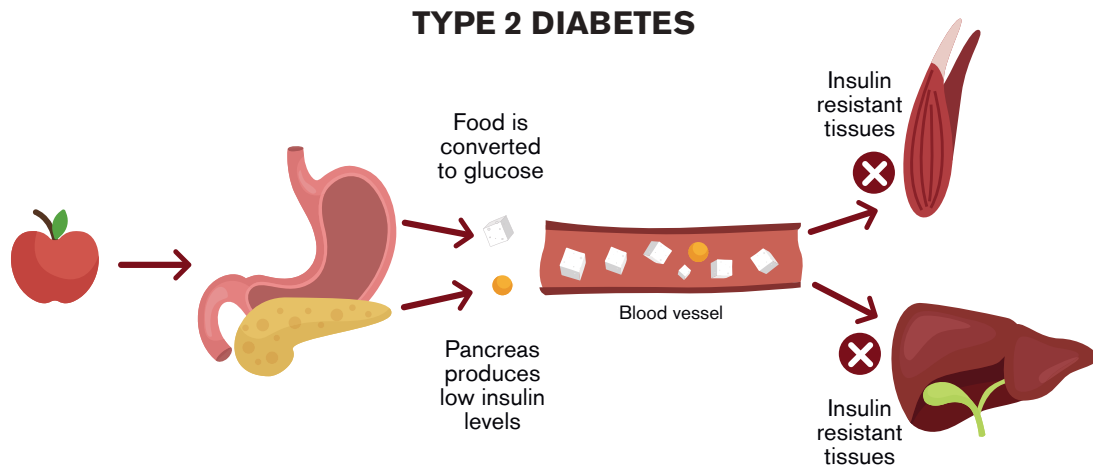
NORMAL INSULIN AND BLOOD SUGAR PROCESS



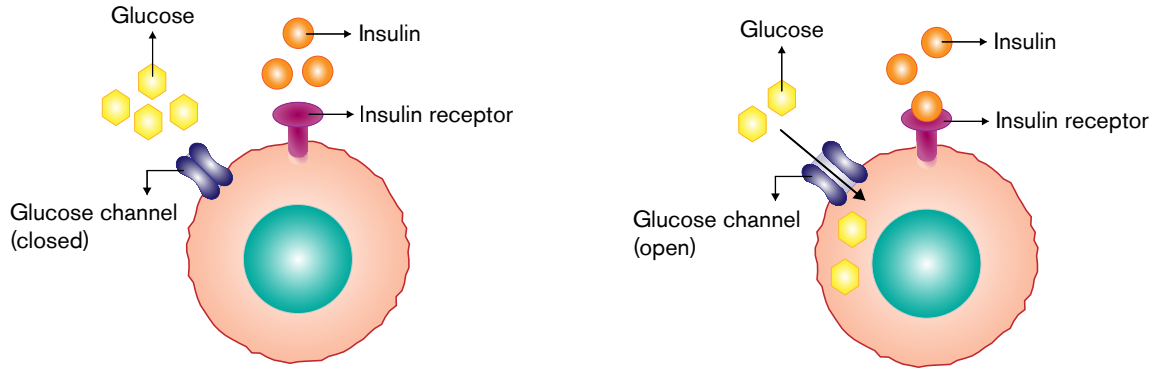
TYPE 1 DIABETES



TYPE 2 DIABETES



INSULIN



Insulin Resistance

Definition

Insulin resistance is a pathological condition where muscle and liver cells fail to respond effectively to insulin, leading to a reduced glucose uptake and an increase in blood insulin levels.

Pathophysiology

Insulin binds to insulin receptor sites on the cells. This initiates signal transduction via insulin receptor substrate proteins.

In insulin resistance, there is impaired activation of the Phosphoinositide 3-Kinase - Protein Kinase B Pathway (PI3K-Akt), leading to reduced Glucose Transporter Type 4 (GLUT4) translocation in muscle and adipose tissues.

The Mitogen-Activated Protein Kinase (MAPK) pathway remains active, contributing to inflammation and vascular dysfunction.

Hepatic insulin resistance leads to increased gluconeogenesis and lipid accumulation, known as Non-Alcoholic Fatty Liver Disease.

Etiology

Genetic factors: Family history, polymorphisms in IRS1, PPARG, and other genes.

Obesity: Excess adipose tissue, particularly visceral fat, secretes pro-inflammatory cytokines (TNF- α , IL-6, resistin) and free fatty acids (FFAs), which impair insulin signalling.

Sedentary lifestyle: Reduced glucose uptake due to lower muscle metabolism.

Dietary factors: A high intake of refined carbohydrates, added sugars and saturated fats. Fructose also contributes to hepatic insulin resistance.

Hormonal imbalances: Polycystic ovary syndrome, Cushing's syndrome, growth hormone excess, hypothyroidism.

Etiology	Chronic inflammation: Systemic inflammation contributes to insulin receptor dysfunction. Medications: Glucocorticoids, thiazides, beta-blockers, antipsychotics.
Clinical Manifestations	Metabolic: Hyperglycemia, hyperinsulinemia, dyslipidemia, central obesity. Cardiovascular: Hypertension, endothelial dysfunction, atherosclerosis. Dermatologic: Acanthosis nigricans, skin tags. Endocrine/reproductive: PCOS, infertility, erectile dysfunction. Hepatic: Non-alcoholic fatty liver disease (NAFLD).
Diagnosis	Fasting insulin and glucose: Raised fasting insulin and glucose levels. Homeostatic model assessment for insulin resistance(HOMA-IR) Oral glucose tolerance test (OGTT): Delayed glucose clearance, high insulin levels. Insulin tolerance test (ITT): Measures insulin sensitivity through glucose disposal rate. Clamp studies (gold standard): Hyperinsulinemic-euglycemic clamp (assesses insulin sensitivity directly).
Complications	Type 2 Diabetes Mellitus (T2DM) begins with insulin resistance, where cells lose sensitivity to insulin, causing the pancreas to produce more. Over time, progressive β-cell dysfunction leads to insufficient insulin production, resulting in high blood sugar levels. Cardiovascular disease: Increased risk of myocardial infarction and stroke. Non-alcoholic fatty liver disease (NAFLD/NASH): Can progress to cirrhosis. Hypertension: Enhanced sodium retention and endothelial dysfunction. Polycystic ovary syndrome (PCOS): Hyperandrogenism, infertility. Neurodegenerative Disorders: Increased risk of Alzheimer's disease ('Type 3 diabetes').
Management	Diet: Low-glycemic index, Mediterranean or ketogenic diet, and reduced sugar intake. Exercise: Aerobic and resistance training improves insulin sensitivity. Weight loss: Reduces visceral fat and pro-inflammatory cytokines.
Prevention	• Regular physical activity and maintaining a healthy weight. • Avoid processed foods and refined sugars. • Early screening in at-risk individuals (e.g., obese, family history of T2DM).



TIPS FOR BLOOD SUGAR BALANCE & REDUCING INSULIN RESISTANCE

LIFESTYLE

Exercise regularly

Strength training increases muscle glucose uptake, improving insulin sensitivity. Walking after meals (10–15 minutes) reduces post-meal blood sugar spikes. HIIT (high-intensity interval training) enhances glucose metabolism.

Manage stress

Chronic stress raises cortisol, which can contribute to insulin resistance. Meditation, deep breathing, or yoga can help lower stress

Prioritise sleep

Poor sleep disrupts insulin regulation. Aim for 7–9 hours of quality sleep per night.

Avoid late-night eating

Eating close to bedtime can disrupt insulin function and lead to higher fasting blood sugar levels.

Limit alcohol and quit smoking

Excessive alcohol impairs glucose metabolism. Smoking increases insulin resistance.

Monitor blood sugar

Track blood glucose levels to identify patterns and triggers.

Cold exposure

Cold showers or ice baths may improve insulin sensitivity by activating brown fat.

DIETARY ADVICE

Consume protein at every meal

Protein slows glucose absorption and prevents blood sugar spikes.

Choose fibre-rich foods

Non-starchy vegetables (e.g, broccoli, spinach, cauliflower), legumes, and whole grains improve insulin sensitivity.

Limit refined carbohydrates and sugar

Reduce white bread, pasta, pastries, and sugary drinks to prevent blood sugar spikes.

Increase healthy fats

Avocados, nuts, and olive oil help stabilise blood sugar levels.





Eat low-glycaemic foods

Stick to foods with a low glycaemic index (e.g., quinoa, berries, and lentils) to prevent insulin surges.

Consume apple cider vinegar (ACV)

Some studies suggest taking ACV may improve insulin sensitivity.

Stay hydrated

Drink plenty of water to help flush excess glucose from the bloodstream.

Consider intermittent fasting

12-16 hour fasting windows may help improve insulin sensitivity.

Balance macronutrients:

Combine carbohydrates, proteins, and fats at each meal to slow glucose absorption.

GLUCOBALANCE®

GlucoseBalance® was formulated by practitioners to help support cravings, fatigue, highs and lows of blood sugar, and weight management. Including Chromium, Cinnamon, Fenugreek Seed, Bitter Melon, Inositol and Apple Cider Vinegar in highly bioavailable forms, GlucoseBalance® is an advanced formula to maintain healthy blood sugar levels and support insulin function.



	PER 2 CAPSULES	EC NRV % *
Cinnamon	750mg	**
Fenugreek Seed	400mg	**
Myo-Inositol	300mg	**
Bitter Melon	250mg	**
Apple Cider Vinegar	200mg	**
Alpha Lipoic Acid	100mg	**
Maitake Mushroom	100mg	**
Chromium	200µg	500

* NRV= Nutrient Reference Value

** No NRV Established

INGREDIENTS

Inositol, Apple Cider Vinegar Powder (*Malus sylvestris*), Alpha Lipoic Acid, Maitake Mushroom Powder (*Grifola frondosa*), Fenugreek Seed Extract (*Trigonella foenum-graecum*), Bitter Melon Extract (*Momordica charantia*), Ceylon Cinnamon Bark Extract (*Cinnamomum zeylanicum*), Chromium Picolinate, Capsule Shell (*Hydroxypropyl Methylcellulose*).

FREE FROM

Added Sugar, Starch, Sweeteners, Gluten, Wheat, Soya, Lactose, Dairy, Artificial Flavours, Colours and Preservatives.

PAIRS WELL WITH



Gut Works®



HeartPro®



Magnesium

Directions

- Take two capsules each day with food.
- We recommend taking it with or within 30-60 minutes after each main meal. Avoid taking it on an empty stomach.
- As a natural, plant-based supplement, it is safe to take alongside most medications and treatments. However, as with all supplements, if you're uncertain, we recommend your clients consult with a GP or healthcare practitioner first.

What customers can look forward to

1-2 weeks

Blood sugar levels could become more consistent. Support for energy slumps and sleep.

2-4 weeks

Improvement in mood swings with fewer highs and lows in blood sugar. Supports macronutrient metabolism.

1-2 months

Supports appetite and digestion with fewer food cravings.

3 months

Improvement in insulin sensitivity and blood lipid levels.

KEY INGREDIENTS IN GLUCOBALANCE®



Cinnamon

Enhances glucose uptake: Cinnamon contains bioactive compounds like cinnamaldehyde and methylhydroxy chalcone polymer, which increase insulin receptor phosphorylation and enhance glucose uptake by cells.¹

Cinnamon mimics insulin action: Cinnamon potentiates insulin, directly stimulating glucose uptake in muscle and adipose tissue.²



Fenugreek Seed

Increases insulin secretion: Fenugreek contains 4-hydroxyisoleucine, an amino acid that enhances pancreatic β -cell insulin secretion.³

Improves GLUT-4 translocation: Within the muscle cells, Fenugreek promotes glucose transporter (GLUT-4) activity, increasing glucose uptake.⁴



Myo-inositol

Enhances insulin sensitivity: Myo-inositol is a precursor to inositol phosphoglycans (IPGs), which act as second messengers in insulin signalling.⁵

Reduces insulin resistance: Myo-inositol promotes PI3K/Akt pathway activation, essential for glucose uptake in muscle and adipose tissue.⁶



Bitter Melon

Mimics insulin (polypeptide P): This plant contains charantins, vicine, and polypeptide P, which exhibit insulin-like effects, reducing blood glucose levels.⁷

Enhances AMPK activation: Bitter melon increases AMP-activated protein kinase (AMPK), a key regulator of glucose metabolism.⁸

Promotes glucose uptake: Bitter melon increases GLUT-4 translocation in muscle and liver, improving glucose disposal.⁹



Apple Cider Vinegar

Reduces postprandial glucose spikes: Acetic acid in Apple Cider Vinegar inhibits disaccharidase enzymes, delaying carbohydrate breakdown and increasing the time it takes for glucose to reach the blood stream.¹⁰

Improves insulin sensitivity: Apple Cider Vinegar increases glucose uptake within the muscles and reduces hepatic gluconeogenesis. Vinegar enhances muscle blood flow, which may facilitate better glucose delivery and uptake by muscle cells.¹¹



Alpha Lipoic Acid

Potent antioxidant: ALA reduces oxidative stress, a main factor in insulin resistance and β -cell dysfunction.¹²

ALA mimics insulin: This mimicking makes it useful for improving glucose uptake in people with insulin resistance. It works through key signalling pathways (p38 MAPK, PI 3-Kinase, Akt1), which are also activated by insulin.¹³

Blocks p38 MAPK: Blocking p38 MAPK reduces glucose uptake and helps control GLUT4 activity.¹³



Maitake Mushroom

β -glucans improve insulin sensitivity: Maitake contains β -glucans, which are polysaccharides that improve insulin sensitivity and glucose tolerance. β -Glucans form a gel-like substance in the gut, slowing down carbohydrate digestion and glucose absorption. This results in a gradual increase in blood sugar levels, preventing insulin spikes and reducing insulin resistance over time.

Regulates pancreatic β -cells: Maitake helps sustain insulin secretion in response to glucose levels.¹⁴



Chromium

Enhances insulin receptor activity: Chromium increases insulin receptor phosphorylation, leading to more efficient glucose uptake.¹⁵

Upregulates GLUT-4: Chromium facilitates glucose transport into muscle and fat cells.^{16,17}

Lowers blood sugar fluctuations: Chromium supplementation reduces postprandial hyperglycemia and improves HbA1c.¹⁸

DRUG INTERACTIONS

Interaction Severity

Moderate

Antidiabetes Drugs	Cinnamon, Fenugreek, Inositol, Bitter Melon, Apple Cider Vinegar, Alpha-lipoic Acid, Maitake and Chromium may lower blood glucose levels, and medications may need to be adjusted.
Antihypertensive Drugs	Cinnamon and Maitake may increase the risk of hypertension when taken with these drugs.
Anticoagulant / Antiplatelet Drugs	Fenugreek and Alpha-lipoic Acid may increase the effects of these drugs.
Clopidogrel	Fenugreek may change the way this drug works.
Metoprolol	Fenugreek may increase the risk of hypotension when used with this drug.
Phenytoin	Fenugreek may decrease the levels of this drug.
Sildenafil (viagra)	Fenugreek may decrease the effects of this drug.
Theophylline	Fenugreek may decrease the levels of this drug.
Warfarin	Fenugreek and maitake may increase the effects of this drug.
P Glycoprotein Substrates	Bitter Melon may increase the levels of these drugs.
Pazopanib	Bitter Melon may increase the risk of side effects from this drug.
Didoxin	Apple Cider Vinegar, when taken with this drug, may increase the risk of toxic cardiac effects.
Diuretic Drugs	Apple Cider Vinegar, when taken with these drugs, may increase hypokalaemia.
Insulin	Apple Cider Vinegar, when taken with this drug, may increase the risk of hypokalaemia. Chromium may increase the risk of hypoglycemia when taken with this drug.

Alkylating Agents	Alpha-lipoic Acid may decrease the effects of these drugs.
Thyroid Hormones	Alpha-lipoic Acid and Chromium may decrease the effects of these drugs.
Antitumour Antibiotics	Alpha-lipoic Acid may decrease the effects of these drugs.

*Drug-nutrient interactions have been taken from the Natural Medicines Database, October 2024.
Please do your own due diligence before recommending this product to individuals taking medicines.*

DR.VEGAN® PRACTITIONER SCHEME

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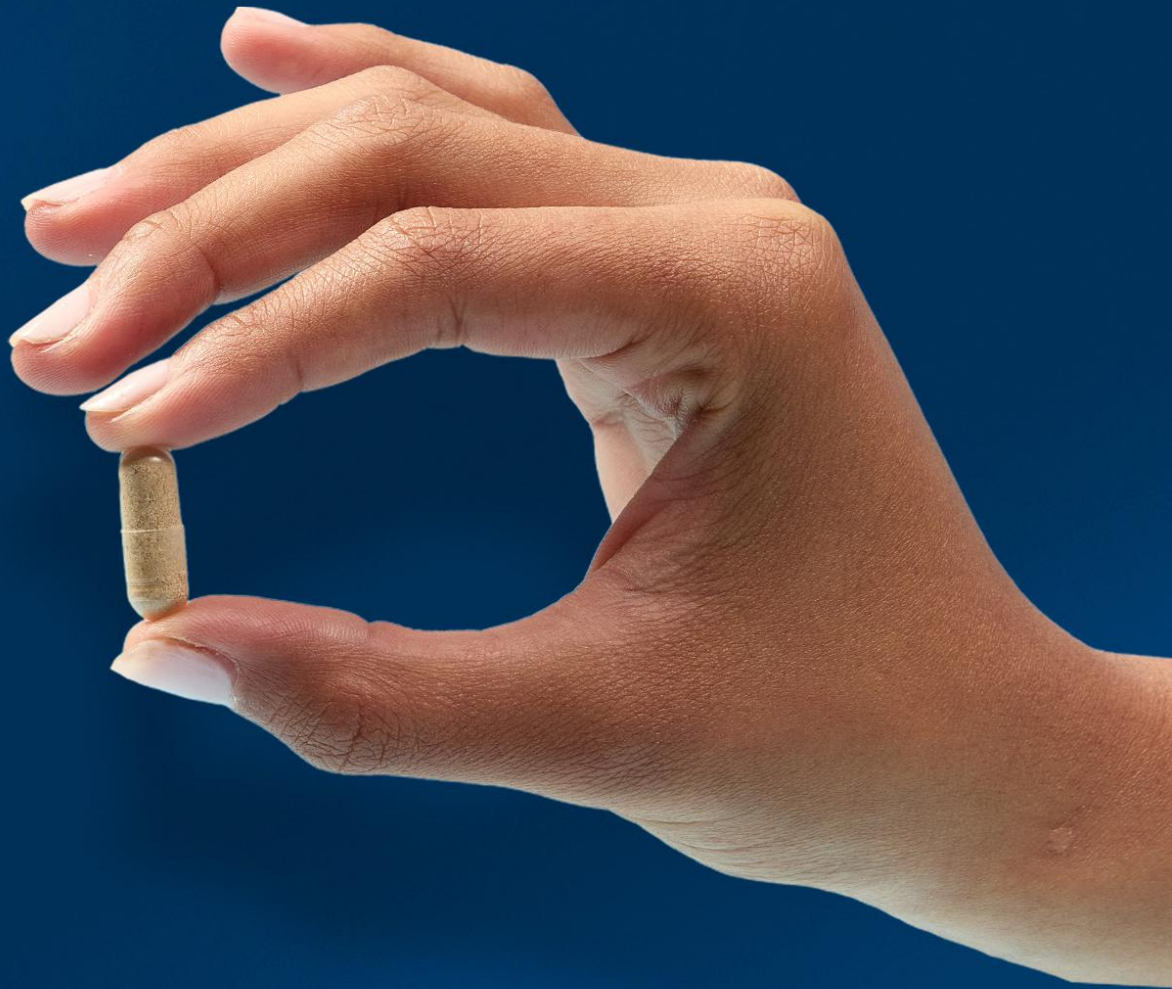


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REFERENCES

1. *J Am Coll Nutr.* 2001 Aug;20(4):327-36.
2. *Diabetes Research and Clinical Practice.* Volume 62, Issue 3, December 2003, Pages 139-148
3. *Journal.* 2017, *European Journal of Medicinal Chemistry.*
4. *Pharmaceuticals (Basel).* 2023 Mar 30;16(4):515.
5. *Open Heart.* 2022 Mar 2;9(1):e001989.
6. *Biochem Soc Trans.* 2023 May 30;51(3):1057–1069.
7. *Nutr Rev.* 2006 Jul;64(7 Pt 1):331-7.
8. *PLoS One.* 2013 Apr 25;8(4):e62309.
9. *Chemistry and Biology* Volume 15, Issue 3, 21 March 2008, Pages 263-273.
10. *April 2000 Journal of Nutrition* 130(3):507-13.
11. *European Journal of Clinical Nutrition* volume 69, pages 734–739 (2015).
12. *Endocrine, Metabolic & Immune Disorders-Drug Targets (Formerly Current Drug Targets - Immune, Endocrine & Metabolic Disorders),* Volume 9, Number 4.
13. *Diabetes* 2001;50(6):1464–1471.
14. *Diabetes Obes Metab.* 2002 Jan;4(1):43-8.
15. *Biochemistry* 2005, 44, 22, 8167–8175.
16. *Molecular Endocrinology,* Volume 20, Issue 4, 1 April 2006, Pages 857–870.
17. *Mutat Res.* 2006 Nov 7;610(1-2):93-100.
18. *Evidence-Based Practice* 16(1):p 5, January 2013.



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