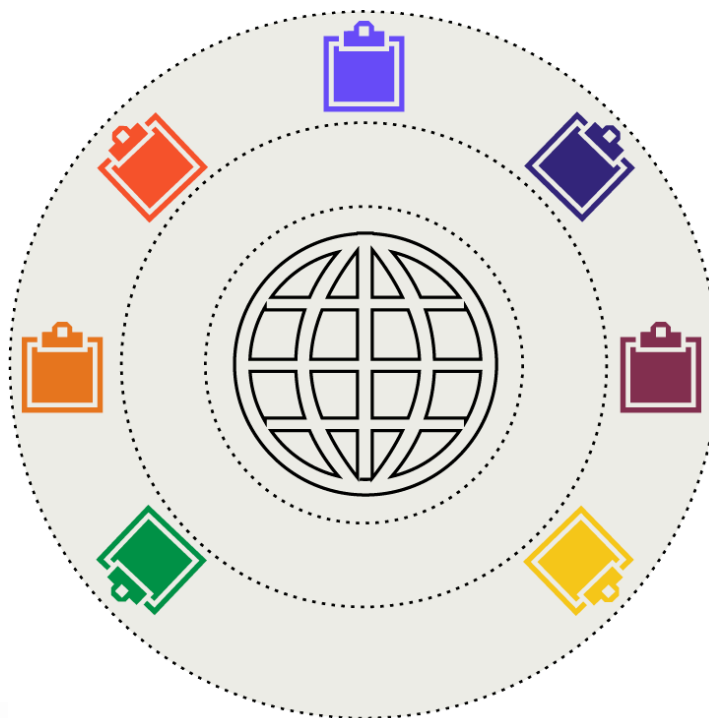


THE POWER OF PREDICTIVE BIOMARKERS

Eight Predictors of Life and Death



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Introduction to Predictive Biomarker Tests

A stitch in time does save nine (stitches); an ounce of prevention is worth a pound of cure. Today, we can identify problems before they become serious—as soon as the body is simply out of balance, before actual damage has been done. Ninety two percent of a person's health is determined by habits—and habits can be changed for the better. Now is the time to take action and save lives: your life and the lives of your patients. This report presents the opportunity to save, and improve, those lives by integrating these predictive biomarker tests and interpretations brought together by Dr. Russell Jaffe, MD, Ph.D., CCN.

Eight Predictive Biomarker Tests

Predictive biomarker test results provide a comprehensive, accessible, actionable and personalized plan for health. Dr. Jaffe has brought together eight functional tests that are predictive of outcome and useful in monitoring therapeutic responses. Normal lab results merely report “usual” or “normal” results or ranges—useful for statistical, but not clinical purposes. Interpreting patient results to these 8 tests in relation to predictive (healthy) goal values is a more effective forecaster of individual health risk or resilience. The test values can indicate years - or even decades - of life either gained or at risk. These tests have been performed on large populations, with sufficient follow up, and we are confident in their predictive power.

Biomarker Test	Measures
Hgb A1c (Hemoglobin A1c)	Blood Sugar, Diabetic Risk, and Insulin Resistance
hsCRP (high sensitivity C-Reactive Protein)	Repair and Inflammation Status
Homocysteine	Methylation, Detox
Oxidized LDL/HDL	Oxidative Stress and Antioxidant Status in Cell Membrane
8-Oxoguanine	Oxidative Stress and Antioxidant Status in Cell Nucleus.
Vitamin D	Cell Communication Status,
First AM Urine pH	Assess mineral need and cell acid/alkaline balance
LRA by ELISA/ACT	Immune response to up to 491 items.

The Eight Predictive Biomarkers & What They Measure

Traditional Test Results Vs. Predictive (Healthy) Goal Values

Until functional predictive tests became available, traditional tests provided us with information about “usual” or “normal” ranges of a particular item of concern; yet these tests provided little or no insight into a person’s relative health or true risk for a condition. Rather, they revealed only if a person was sicker than the population used to standardize that test. By contrast, predictive biomarker Goal Values put forth here by Dr. Jaffe provide information consistent with the concepts of “optimum” or “high-level health” values championed by Cheraskin and Ringsdorf or the individual needs for nutrients pioneered by Roger Williams.

Biomarker Test	Predictive Goal Value	Indicates
Hgb A1c (Hemoglobin A1c)	< 5%	The body is effectively managing blood sugar levels
hsCRP (high sensitivity C-Reactive Protein)	< 0.5 mg/L	The body is in a steady state of repair
Homocysteine	< 6µmol/L	The body has enough methylation nutrients to keep homocysteine levels in normal range, reducing cardiac risk
Oxidized LDL/HDL	~0	Adequate antioxidant protection
8-Oxoguanine	< 5.3 ng/mg of creatinine	Adequate antioxidant protection
Vitamin D	50-80ng/mL	Sufficient Vitamin D to maintain cellular equilibrium and communication.
First AM Urine pH	6.5-7.5	Healthy pH
LRA by ELISA/ACT	No Delayed Allergies	Healthy Immune Tolerance

Predictive Test #1: Hemoglobin A1c (Hgb A1c)

Blood Sugar, Diabetic Risk & Insulin Resistance

This marker is the one most often used to evaluate blood sugar, diabetic risk and insulin resistance. A decade ago, blood sugar was measured by testing glucose levels on a given day. However, blood glucose level reflects only activity over the previous 12 to 18 hours. In contrast, Hgb A1c indicates the average blood sugar level *for the previous three months*.

This is important because frequently patients have normal blood glucose on a given test day, but their Hgb A1c levels could be elevated. Day-to-day blood glucose levels can fluctuate with exercise, meal timings or other medications. More importantly, high blood glucose levels tend not to be the norm until a person has advanced pre-diabetes. Hgb A1c provides a much more reliable indication of actual, immediate risk.

Hgb A1c marks insulin resistance; when levels are elevated (Hgb A1c >5 %), that means the body is no longer properly managing blood sugar levels. Elevated levels also strongly suggest a tendency toward higher inflammation throughout the body.

Research has shown that insulin resistance and pre-diabetes can frequently be improved with diet and exercise. Hgb A1C provides a reliable test to evaluate the effects of dietary and nutritional support programs*.

Biomarker	Predictive (Healthy) Goal Value (GV)	Elevated Levels (Above GV) Indicate
Hemoglobin A1c (Hgb A1c)	< 5 %	Levels = or > 5 % indicate the body is not effectively managing blood sugar.

Ask **PERQUE Integrative Health (**PIH**) about evidence-based solutions to bring Hgb A1c to healthy goal value.*

Predictive Test #2: High-Sensitivity C-Reactive Protein Inflammation

C-Reactive Protein (CRP) is one of the first widely-available tests that offers a tangible marker of inflammation. The *High-Sensitivity C-reactive Protein* (hsCRP) test measures very low amounts of CRP in the blood providing much more precise and accurate readings. When CRP is high, that is a definite indication of an inflammatory process present throughout the body. (Note: In some cases inflammation is present, yet CRP is not elevated.) CRP levels are considered elevated when greater than .5 mg/L.

When inflammation persists, that is almost always a feature of subclinical disease—a process smoldering below the surface that is not yet detectable, but in which tissue damage is occurring.

High CRP levels are common in pre-diabetes and diabetes, reflecting insulin resistance and metabolic syndrome—all conditions associated with a high risk of cardiovascular disease. Elevated CRP levels can also indicate a long-term infection. It is also an important marker of cardiovascular risk.

As a predictive biomarker, hsCRP reflects the effectiveness and efficiency of immune defenses, which are responsible for neutralizing any sign of infection, repairing daily wear and tear, and identifying and eliminating cancerous cells.

Biomarker	Predictive (Healthy) Goal Value (GV)	Elevated Levels (Above GV) Indicate
High sensitivity C-Reactive Protein (hsCRP)	< 0.5 mg/L	Systemic inflammation which could be associated with pre-diabetes or diabetes, insulin resistance and metabolic syndrome—all conditions associated with increased cardiovascular risk. Elevated CRP levels can also indicate a long-term infection.

Predictive Biomarker Test #3: Homocysteine

Cardiovascular Risk

This chemical byproduct of cell function, homocysteine, is a widely-recognized marker of cardiovascular risk, and looks at risk independently of other markers, like cholesterol. Homocysteine levels reflect a process that occurs within every cell in the body, known as methylation chemistry. Methylation and cell detoxification control the expression of our genetic material through DNA, RNA and protein replication. When this process is not working properly, homocysteine levels are elevated; therefore, this marker reveals function or dysfunction on the most basic level.

Homocysteine levels are considered elevated when greater than 6 $\mu\text{mol/L}$. High homocysteine is associated with disorders ranging from heart disease and cancer to Alzheimer's disease and osteoporosis. The good news is that elevated homocysteine levels reflect an imbalance correctable through diet and supplements*. As homocysteine levels return to a more normal range, it indicates reduced risk.

Biomarker	Predictive (Healthy) Goal Value (GV)	Elevated Levels (Above GV) May Indicate
Homocysteine	< 6 $\mu\text{mol/L}$	Reveals dysfunction on the most basic level and may indicate disorders and risk of conditions ranging from heart disease and cancer to Alzheimer's disease and osteoporosis.

Ask **PIH about evidence-based solutions to bring homocysteine levels to healthy goal value.*

Predictive Test #4: Oxidized LDL/ HDL

Oxidative Stress & Antioxidant Status

Oxidized LDL is a measure of the health of DNA in our mitochondria, the “engine” within each cell that makes energy. In essence, this is a measure of the health of our cells. Though the test has only recently become available, the technology has been used in research studies for more than ten years and at least 400 papers have been published evaluating oxidized LDL cholesterol. This is a highly accurate, breakthrough predictor in cardiovascular risk assessment. (Studies using oxidized HDL/LDL show a 90% accuracy rate for cardiovascular prediction vs. 50% accuracy rate for cholesterol testing.)

This test answers the question, “Is there increased stress in this critical area and if so, how much?” Impaired function of mitochondria is one of the central failures in nearly every form of chronic illness. In addition to being the most reliable independent indicator of heart health currently available, the Oxidized LDL/HDL test is predictive of longevity. One of the absolute limits on human life span is how rapidly our cell DNA are damaged, or oxidized. This test provides that information, indicating oxidative stress level.

Biomarker	Predictive (Healthy) Goal Value (GV)	Elevated Levels (above GV) Indicate
Oxidized LDL/ HDL	~0	Increased oxidative stress: A highly accurate predictor of cardiovascular risk.

Predictive Test #5: 8-oxoguanine

Oxidative Stress & Antioxidant Status

Lab testing for 8-oxoguanine (8-hydroxy-2'-deoxyguanosine (8OHdG)) provides a second important marker for oxidative stress and its effects on DNA. This indicator focuses on the acceleration of aging due to potential DNA damage. The test is highly regarded as a measure of oxidative stress and well supported in the research literature.

Tracking the results of this test provides an indication of: 1) whether there is a problem due to oxidative stress, and 2) whether interventions* are having an effect.

When antioxidant levels are sufficient, it prevents oxidative damage caused by free radicals. Healthy levels of antioxidants, such as ascorbate, mean efficient energy production in the cells.

Elevated levels of both 8-oxoguanine and oxidized HDL/ LDL indicate higher levels of inflammation and oxidative stress throughout the body—factors that underlie almost any form of chronic illness.

Biomarker	Predictive (Healthy) Goal Value (GV)	Elevated Levels (Above GV) Indicate
8-oxoguanine	<5.3 ng/mg of creatinine	Higher levels of inflammation and oxidative stress—which underlie most chronic illness.

Ask **PIH about evidence-based solutions to reduce oxidative stress.*

Predictive Test #6: Vitamin D

Cell Communication

The medical literature currently contains more than 50,000 articles on Vitamin D. Vitamin D levels play a significant role in a number of systems in the body, including immune and neurological regulation, and bone health. When levels of this nutrient are low, that increases the risk of cancer and heart disease, autoimmune disorders and psychiatric and mood problems.

In addition, according to the National Institutes of Health, Vitamin D may play a role in prevention and treatment of Type 1 and Type 2 Diabetes, hypertension, glucose intolerance, multiple sclerosis, and other medical conditions.

Vitamin D:

- **Moderates cell division** — Vitamin D is a hormone whose function is to provide vital communication links between cells, to normalize cell growth and prevent aggressive cell production.
- **Prevents autoimmune disorders** —Control mechanisms are built into the immune system that prevent immune activity from causing damage due to inflammation—Vitamin D is essential to the function of these control mechanisms.
- **Reduces inflammation in the brain and nervous system** —Vitamin D moderates inflammatory processes in the neurological system. This is particularly important, since the brain lacks the regulatory systems to moderate inflammation effectively.

Vitamin D levels are considered healthy when 50-80 ng/L6.

Most treatments involve more than a single approach. However, when Vitamin D is lacking, no other intervention will be 100% effective. Knowing Vitamin D status is essential to correct any depletion.

Biomarker	Predictive (Healthy) Goal Value (GV)	Deficient Levels (Below GV) May Indicate
Vitamin D	50-80 ng/mL	Increased risk of cancer, heart disease, autoimmune disorders.

Predictive Test #7: First-morning pH

Acid/Alkaline Balance & Mineral Status

The pH level of urine after 6 hours of rest reflects pH throughout the body, and is an indicator of metabolic status. Levels below 6.5 indicate metabolic acidosis. Low pH also suggests mineral deficits, because minerals are pulled from bone and body fluid during metabolic acidosis to maintain pH within a health range.

Tiny changes in pH have profound implications for cell metabolism. Life exists poised exquisitely just above the neutral point of 7.0. Levels of pH above 7.5 can indicate catabolic illness in which amino acids are used as energy sources. Healthy urine pH is within the 6.5-7.5 pH range.



Excess acid
wears you
out

Too Acidic
(<6.5)



Healthy
Repair /
Restore Zone

Healthy pH
($6.5-7.5$)



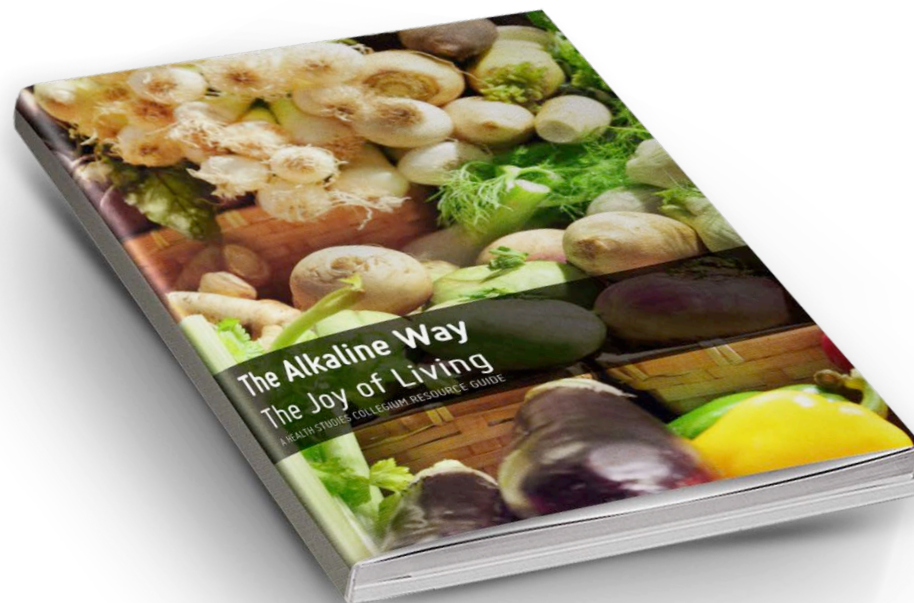
Catabolic
illness tears
you down

Too Alkaline
(>7.5)

Predictive Test #7: First-morning pH (continued)

Acid/Alkaline Balance & Mineral Status

Any unusual variation in body pH is usually reflected in the first morning urine. This calls for changes in diet and/or nutritional supplements to restore acid-alkaline balance. Simply checking the pH level each day provides ongoing monitoring to see whether pH has been corrected. This is an important aspect of biochemistry—so if there is an abnormality, that has to be monitored regularly.



Biomarker	Predictive (Healthy) Goal Value (GV)	pH above 7.5 Indicates	pH Below 6.5 Indicates
First-morning (AM) Urine pH	pH 6.5-7.5	Catabolic illness in which amino acids are used as energy sources.	Metabolic acidosis; mineral deficits.

Ask **PIH for a complimentary pH test kit and solutions for alkalinizing.*

The Alkaline Way is a lifestyle approach to establish healthy acid/alkaline balance. Email ClientServices2@PERQUE.com to request a copy of "The Alkaline Way: The Joy of Food"

Predictive Biomarker Test #8: LRA by ELISA/ACT®

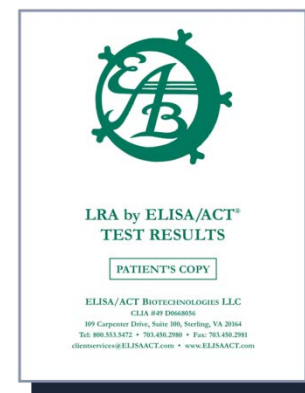
Hidden or Delayed Allergies

The Lymphocyte Response Assay (LRA) by **ELISA/ACT®** makes it possible to examine the general health of a patient's immune system by monitoring delayed hypersensitivity responses to over 490 common substances. **LRA by ELISA/ACT** tests are the first and only blood tests that provide a complete evaluation of the body's delayed immune response. The tests identify reactive substances that may be provoking the patient's chronic condition. Patients are also provided a personalized treatment plan to help eliminate these sensitivities and restore overall health.



Identifying the patient's specific sensitivities and the delayed allergies that burden the immune system is a clinical breakthrough. Patients often experience a dramatic improvement in their quality of life as a result of the individualized treatment plan.

These tests avoid false positives common in other types of delayed allergy tests.



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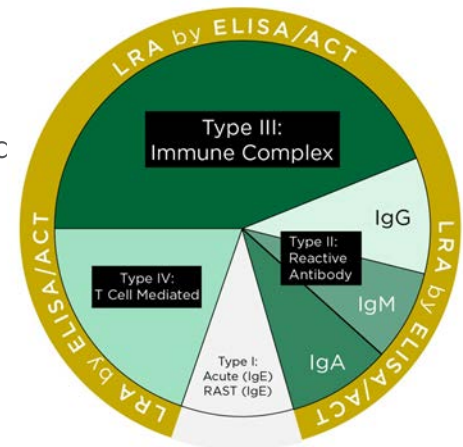
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LRA by ELISA/ACT tests are:

Comprehensive—

The only test that measures all 3 delayed allergy pathways at one time (Type II, Type III, and Type IV) and offers the most items for testing.



Functional—Identifying only symptom provoking reactive substances, not merely the presence of antibodies, which can be harmful or protective.

Ex-vivo—The unique ex vivo system tests the lymphocytes as though they are still in the bloodstream being exposed to foreign invaders, thereby, providing highly specific and accurate information

Predictive Biomarker Test #8: LRA by ELISA/ACT[®] (continued)

Hidden or Delayed Allergies

Six months after initial LRA tests, a reevaluation of progress is recommended with 3 possible outcomes.

- 1). If patient has recovered fully, a guided gradual reintroduction of previously reactive items is advised.
- 2). If patient is improved but not yet well, repeat LRA tests. Since the digestion system (among others) takes time to recover, it is common for people to lose some reactive items and acquire new ones. A repeat program starting from a healthier base is likely to further improve health and sustain remission.
- 3). If patient reports following instructions carefully (including avoiding reactive items) but is still not improved, it's recommended to look for toxins that might serve as inhibitors to recovery. If a person reports making best efforts at following the program and does not report improvement, repeat testing is not indicated.

Biomarker	Predictive (Healthy) Goal Value (GV)	Unhealthy Value (Presence of Delayed Allergies)
LRA by ELISA/ ACT	"No delayed allergies"	Over burdened immune system.

Learn more about the LRA by ELISA/ACT tests. Ask ELISA/ACT Biotechnologies (EAB) for a sample patient report or professional courtesy pricing to test yourself.

Summary: Eight Biomarkers & Their Predictive (Healthy) Goal Values

Test Name	Test Descriptions	Predictive Goal Values
Hgb A1c (Hemoglobin A1c)	Efficiency of sugar / insulin / energy conversion	<5%
hsCRP (High sensitivity C reactive protein)	Repair and inflammation immune status	<0.5 mg/L
Homocysteine (cardiovascular risk)	Detoxification and epigenetic modulation / methylation status	< 6 µmol/L
Oxidized LDL/HDL (Oxidized blood fats)	Oxidative stress and antioxidant status in cell envelope (membrane)	~0
8-Oxo-Guanine (Deoxyguanosine)	Oxidative stress and antioxidant status in cell nucleus	<5.3 ng/mg creatinine
Vitamin D (25-Hydroxycholecalciferol)	Vitamin D level for cell communication status	50 – 80 ng/mL
1st AM Urine pH (Metabolic acidosis assessment)	Assess mineral need and cell acid/alkaline balance	6.5 – 7.5
LRA by ELISA/ACT™ (Immune memory, delayed allergy cell cultures)	Test for immune memory / immune response to up to 491 items	Healthy immune tolerance means no delayed allergic LRA reactions

Through integrative science we now understand how distinct yet overlapping systems enhance health and reduce risk.

We can now distinguish primary causes from consequential symptoms.

Incorporating these eight predictive biomarkers into your practice will empower you to offer patients evidence-based approaches to reduce risk; these personalized, proactive interventions add years to life, and life to years.

Help Your Patients

Add Years to Life and Life to Years

Offer Biomarker Tests and Solutions to Keep or Bring to Predictive Goal Value

Request A Biomarker Log

Call PERQUE Integrative Health today for a helpful one-page reference table listing of predictive biomarkers—test descriptions, predictive goal values and log for patient test results. It serves as a helpful aid in explaining the biomarker tests to your patients and in tracking the effects of dietary and nutritional programs.

Solutions

Dr. Jaffe's "Eat, Drink, Think & Do" protocols for bringing each biomarker back to the healthy goal value are available through PERQUE Integrative Health. Contact PIH Client Services at 1.800.525.7372 or at ClientServices2@PERQUE.com. Just ask for the 'Biomarker Solutions'.

Open an ELISA/ACT Biotechnologies Account

The LRA by ELISA/ACT tests are available exclusively through ELISA/ACT Biotechnologies (EAB). Call 1-800-553-5472 today to open and account and start offering the LRA by ELISA/ACT as part of this comprehensive panel of Predictive Biomarkers.



About Dr. Jaffe



Dr. Jaffe was trained in medicine and biochemistry at Boston University followed by board certifications in Clinical Pathology while on the staff of the National Institutes of Health (NIH). He continued on the permanent senior staff of NIH until 1979 when he left to continue his cross-trainings in Traditional Chinese Medicine (TCM), Ayurveda, nutrition and mindfulness practice. He founded ELISA/ACT Biotechnologies to provide personalized, comprehensive predictive tests of immune function and hypersensitivity / delayed allergy.

Subsequently, Dr. Jaffe founded **PERQUE** Integrative Health to provide dietary supplements that are scientifically superior—and that provide maximum uptake and health benefits. **PERQUE** supplements are all-active and include transporters and delivery systems that chaperone and protect delicate nutrients and their combinations.

Dr. Jaffe also founded Health Studies Collegium, a research foundation, and RMJH Rx to advance drug development based on his patents. He maintains Fellow status in: American Society for Clinical Pathology; American College of Allergy, Asthma and Immunology; American College of Nutrition; Health Studies Collegium; and the National Academy of Clinical Biochemistry.

About ELISA/ACT Biotechnologies & PERQUE Integrative Health

PERQUE™ Integrative Health (PIH) has spent the last 30 years rethinking healthcare as we know it. PIH founder and CEO, Dr. Russell Jaffe initiated this process in 1984 when he developed the LRA by ELISA/ACT, the world's first single-step amplified (ELISA) procedure for use in delayed allergy testing. Dr. Jaffe's innovations in applying the biological systems that restore the body to the fullest measure of attainable health for each individual led to the formulation of the **PERQUE** line of safer more effective, novel dietary supplements and supplement delivery systems.

Today, PIH works with healthcare practitioners to offer patients integrated systems of personalized care that combine validated assessment protocols and tools, the most advanced autoimmune testing, and the **PERQUE** brand of scientifically superior and more effective nutraceuticals. Clinical outcome studies of these systems have confirmed the results achieved in better managing such common conditions as diabetes, fibromyalgia muscle pain, and chronic fatigue syndrome (CFIDS).

For more information on PIH or Dr. Jaffe, please visit www.perque.com or www.ELISAACt.com



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