



TRACE ELEMENTS, INC.

4501 Sunbelt Drive • Addison, TX 75001 • USA

LABORATORY NO: 890693

PROFILE NO: 2

SAMPLE TYPE: SCALP

PATIENT: HAN. SANGHYUN

AGE: 9

SEX: M

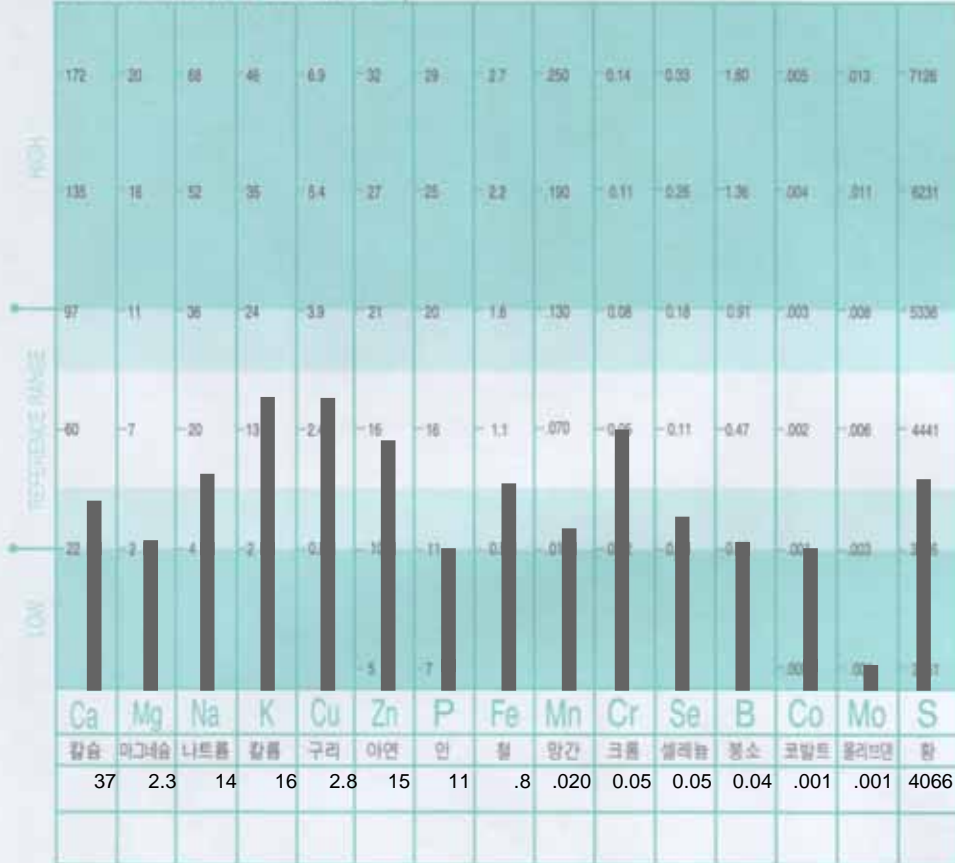
METABOLIC TYPE: SLOW4

REQUESTED BY: HUNGYEONG LEE

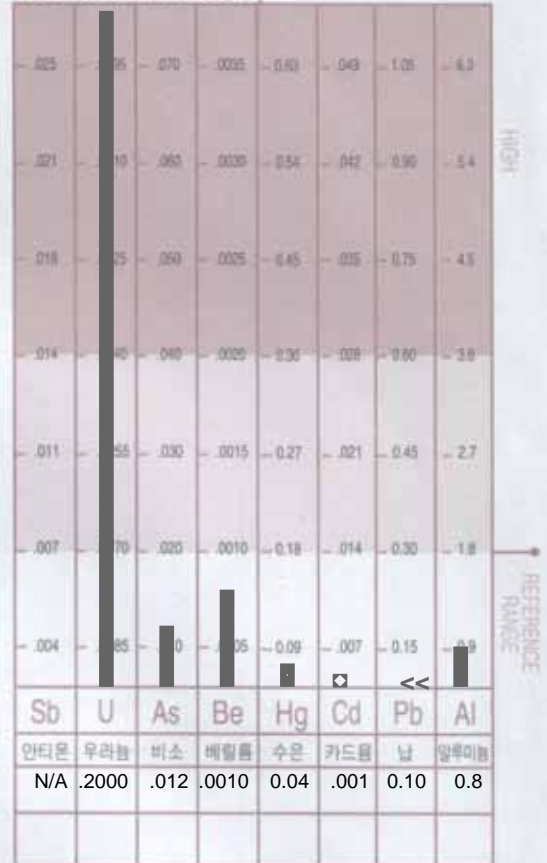
ACCOUNT NO: 4011

DATE: 2008-05-28

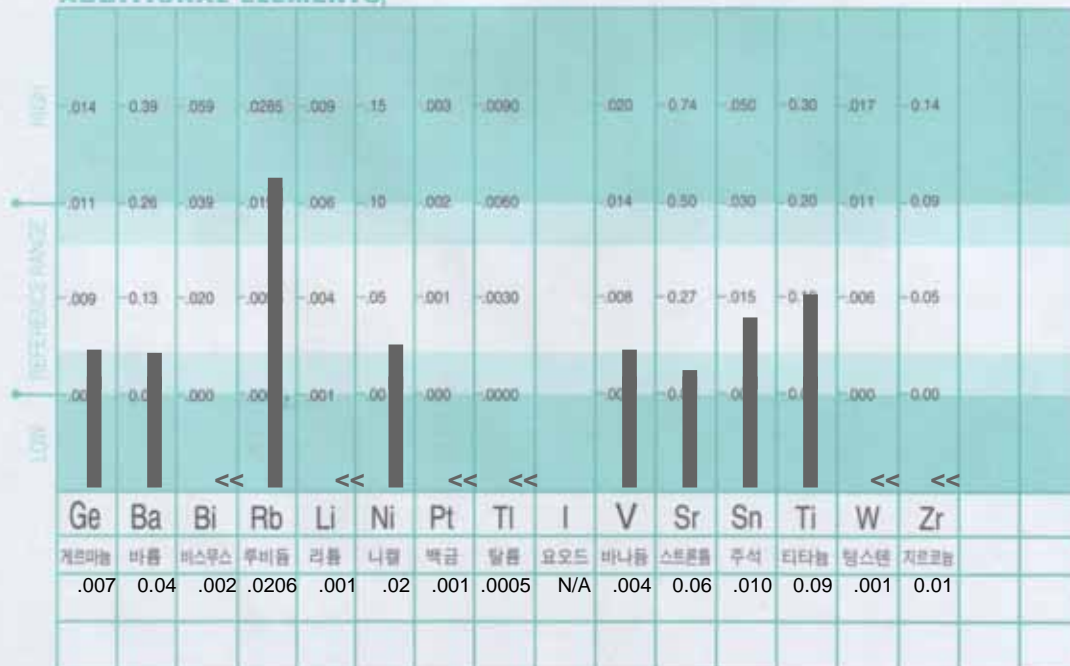
## NUTRITIONAL ELEMENTS



## TOXIC ELEMENTS



## ADDITIONAL ELEMENTS

"C": Below Calibration Limit.  
Value Given to Calibration Limit.

"QNS": Sample Size Was Inadequate For Analysis.

"NA": Currently Not Available.

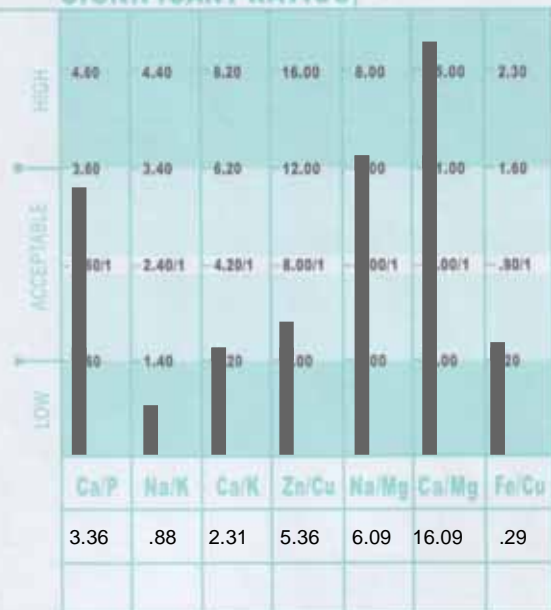
Ideal Levels And Interpretation Have Been Based On  
Hair Samples Obtained From The Mid-Parietal To The  
Occipital Region Of The Scalp.Laboratory Analysis Provided by  
Trace Elements, Inc., an H.H.S. Licensed Clinical  
Laboratory No. 45 D0481787

2008-05-28

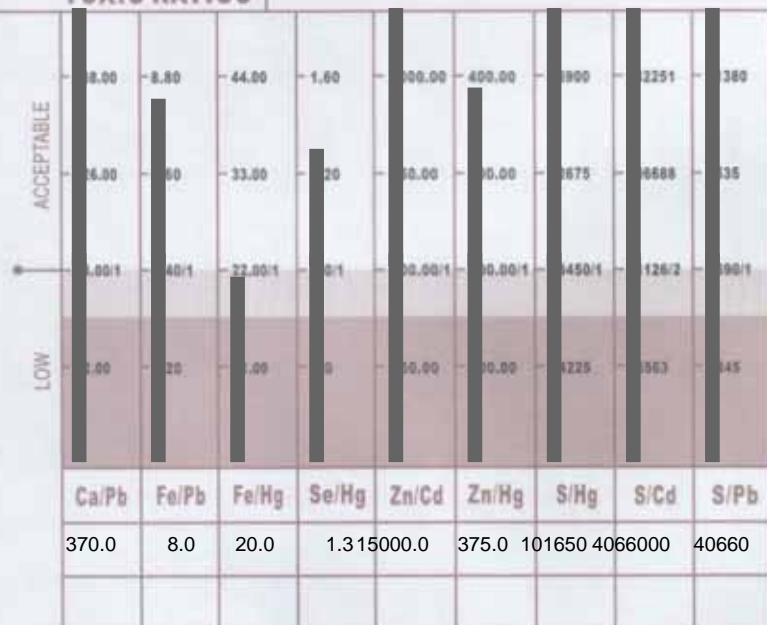
CURRENT TEST RESULTS

PREVIOUS TEST RESULTS

## SIGNIFICANT RATIOS



## TOXIC RATIOS



## ADDITIONAL RATIOS

RATIO	CALCULATED VALUE		OPTIMUM
	Current	Previous	
Ca/Sr	616.67		131/1
Cr/V	12.50		13/1
Cu/Mo	2800.00		625/1
Fe/Co	800.00		440/1
K/Co	16000.00		2000/1
K/Li	16000.00		2500/1
Mg/B	57.50		40/1
S/Cu	1452.14		1138/1
Se/Ti	100.00		37/1
Se/Sn	5.00		0.67/1
Zn/Sn	1500.00		167/1

## LEVELS

All mineral levels are reported in milligrams percent (milligrams per one-hundred grams of hair). One milligram percent (mg%) is equal to ten parts per million (ppm).

## NUTRITIONAL ELEMENTS

Extensively studied, the nutrient minerals have been well defined and are considered essential for many biological functions in the human body. They play key roles in such metabolic processes as muscular activity, endocrine function, reproduction, skeletal integrity and overall development.

## TOXIC ELEMENTS

The toxic minerals or "heavy metals" are well-known for their interference upon normal biochemical function. They are commonly found in the environment and therefore are present to some degree, in all biological systems. However, these metals clearly pose a concern for toxicity when accumulation occurs to excess.

## ADDITIONAL ELEMENTS

These minerals are considered as possibly essential by the human body. Additional studies are being conducted to better define their requirements and amounts needed.

## RATIOS

A calculated comparison of two minerals to each other is called a ratio. To calculate a ratio value, the first mineral level is divided by the second mineral level.

EXAMPLE: A sodium (Na) test level of 24 mg% divided by a postassium (K) level of 10mg% equals a Na/K ratio of 2.4 to 1.

## SIGNIFICANT RATIOS

If the synergistic relationship (or ratio) between certain minerals in the body is disturbed, studies show that normal biological functions and metabolic activity can be adversely affected. Even at extremely low concentrations, the synergistic and/or antagonistic relationships between minerals still exist, which can indirectly affect metabolism.

## TOXIC RATIOS

It is important to note that individuals with elevated toxic levels may not always exhibit clinical symptoms associated with those particular toxic minerals. However, research has shown that toxic minerals can also produce an antagonistic effect on various essential minerals eventually leading to disturbances in their metabolic utilization.

## ADDITIONAL RATIOS

These ratios are being reported solely for the purpose of gathering research data. This information will then be used to help the attending health-care professional in evaluating their impact upon health.

## REFERENCE RANGES

Generally, reference ranges should be considered as guidelines for comparison with the reported test values. These reference ranges have been statistically established from studying a population of "healthy" individuals.

**Important Note:** The reference ranges should not be considered as absolute limits for determining deficiency, toxicity or acceptance.