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ساختمان نویان نگین پارسیان

[www.nouyan-co.com](http://www.nouyan-co.com)

NOUYAN\_NEGIN\_PARSIAN

۰۲۱.۴۹۳۷۵۰۰۰ (خط ویژه)

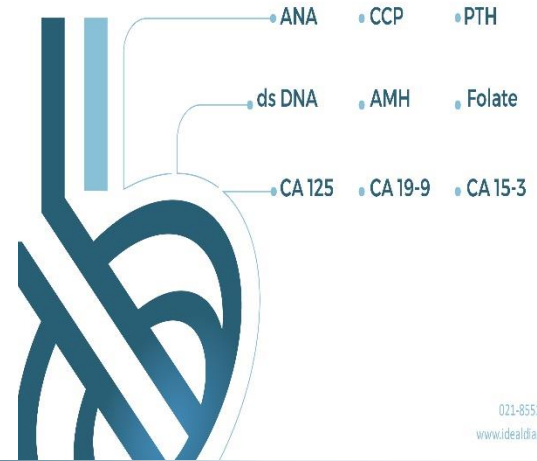
Products	Thyroid Panel	T3 (96)	Tumor Markers	*PSA (96)	* تکمیل پلانت استریو ویدئو-تیفون
		T3 (192)		*Free PSA (96)	
		T4 (96)		*CEA (96)	
		T4 (192)		*AFP (96)	
		*TSH (96)		*CA 125 (96)	
		*TSH (192)		*CA 19-9 (96)	
		Free T3 (96)		*CA 15-3 (96)	
		Free T4 (96)		*DHEA-S (96)	
		T uptake (96)		*17OH-Progesterone (96)	
		*Anti-TPO		*E2 Estradiol (96)	
	Infectious Diseases	*Anti-H.pylori-IgA (96)	Steroids Panel	*Testosterone (96)	
		*Anti-H.pylori-IgM (96)		*Progesterone (96)	
		*Anti-H.pylori-IgG (96)		*Cortisol (96)	
	Rheumatology	ANA (96)	Vitamin D	*Free Testosterone	
		Anti-ds DNA (96)		25-Hydroxy Vitamin D (96)	
		CCP (96)		25-Hydroxy Vitamin D (192)	
	Anemia	*Ferritin (96)	Allergy	*IgE (96)	
		*Ferritin (192)		SARS-COV-2-IgG	
		*Vitamin B12 (96)	SARS-COV-2	SARS-COV-2-IgM Capture (96)	
		*Folate (96)		SARS-COV-2 Antigen Rapid	

Growth Hormone	*hGH (96)	Products
ParaThyroid Hormone	*PTH (96)	
	*LH (96)	
Fertility Panel	*FSH (96)	
	*PRL (96)	
	*βHCG Titr (96)	
	βHCG (96) Rapid	
	βHCG (192) Rapid	
	AMH (96)	

#### NEW Kits

Rheumatology	ANA (96)	* تکمیل پلانت استریو ویدئو-تیفون
Tumor Markers	Anti-ds DNA (96)	
	CCP (96)	
	*CA 125	
Fertility	*CA 19-9	
	*CA 15-3	
Anemia	Folate	
Miscellaneous	PTH	

#### NEW Kits



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عضو شبکه تشخیص ایده آل

021-85519519  
www.idealdiag.com

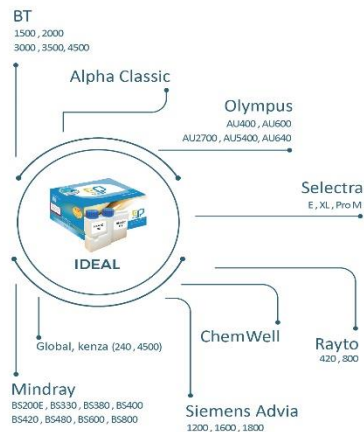
• ANA • dsDNA • CCP • AMH • Folate • PTH

• CA 125 • CA 19-9 • CA 15-3

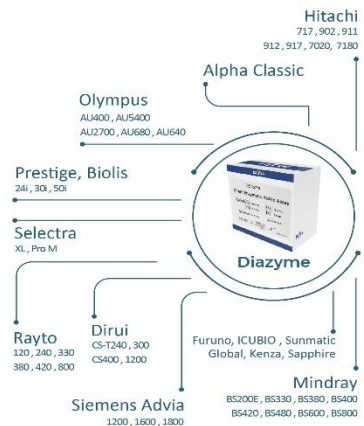
#### NEW KITS

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کیت های تشخیص طبی الیزا



HbA1C



• Tumor Markers

• Thyroid

• Gastroenterology

• Fertility

• Steroids

• Anemia

• Allergy

• Coagulation

• Vitamin D

• Thrombosis

• Rheumatology

• Vasculitis

• Infectious Diseases

#### Samantajhiz

samantajhiz.com



- ANA
- ds DNA
- CCP
- AMH
- CA 19-9
- Folate
- CA 125
- PTH
- CA 15-3



تولید کننده

NEW KITS

• کیت‌های تشخیص طبی الایزا



NEW Kits

- ANA
- CCP
- PTH
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- AMH
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- CA 125
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**JAL TAJHIZ MEHRAN**  
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**JAL TAJHIZ MEHRAN**  
LAB EQUIPMENT DESIGN & PRODUCTION

(طراحی - مشاوره - اجرا و ساخت تجهیزات آزمایشگاهی و تحقیقاتی)

با مجوز از وزارت بهداشت درمان و آموزش پزشکی و وزارت صنایع و معادن استان تهران

# eCL8000

## Electro-chemiluminescence Immunoassay (ECLIA) System

### ASSAY MENU

#### Infectious Disease

SARS-CoV-2 IgM  
SARS-CoV-2 IgG

#### Thyroid Function

T4  
T3  
FT4  
FT3  
TSH  
Tg  
TBO  
Anti-TPO  
Anti-Tg

#### Bone Metabolism

25(OH)VD  
PTH  
CT

#### Anemia

Folate  
Ferritin

#### Fertility

E2  
TESTO  
PROG  
HCG  
FSH  
LH  
PRL

#### Hepatic Fibrosis

CS  
UN  
CIV  
FIBRP  
HA

#### Glycometabolism

Insulin  
C-peptide

#### Inflammation and Infection

PCP  
CRP  
IL-6

#### Gastritis

PG I  
PG II

#### Cardiac Markers

MPD  
CK-MB  
NT-proBNP  
cTnI  
Digoxin  
H-FABP  
Isp-PLA2  
Cardiac Control

### Specifications

#### Methodology

#### Test Mode

#### Reagent Channels

#### Sample Positions

#### Sample Type

#### Sample Volume

#### Reaction Positions

#### Reaction Cups

#### Throughput

#### Incubation Temperature

#### Reagent System

#### System Reagent

#### Probe

#### Dimensions

#### Weight

Electro-chemiluminescence Immunoassay (ECLIA)

Standard, STAT

10

30

Serum, Plasma

5 - 100 µL

100

Disposable

86 T/Hour

37±0.5°C

Liquid Level Detection; Refrigeration, 4 - 15°C;

Buffer and Auffer; Slot Temperature 28±2°C

Liquid Level Detection, Probe Crashing Protection, Probe Blocking Detection

650 mm×620 mm×650 mm (25.6" H x 24.4" W x 25.5" D)

92 kg (203 lbs)



# eCL8000

## Electro-chemiluminescence Immunoassay (ECLIA) System



No. 522 and 524, Hegen Sars Building  
Hegen Sars Park, Val-Ar Avenue, Tehran  
1433003866, 9094  
Tel: +98 21 88 70 30 50 (10 Lines)  
Fax: +98 21 88 70 30 52  
www.bd-mad.com info@bd-mad.com



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پارک هگن سارس، خیابان وال-آر، تهران  
تلفن: +۹۸ ۲۱ ۸۸ ۷۰ ۳۰ ۵۰ (خط ۱۰)  
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## ژال تجهیز

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با مجوز از وزارت بهداشت درمان و آموزش پزشکی و وزارت صنایع و معادن استان تهران

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

# Thyroid Related Tests

*M Reza Bakhtiari, DCLS, PhD*



dr.bakhtiari.academy

# Thyroid Lab Tests

Thyroid-related Laboratory tests can be divided into **five (5)** major categories:

- (1) Tests assessing Hypothalamus-Pituitary-Thyroid (**HPT**) **axis**
- (2) Tests estimating serum concentrations of **T4 & T3**
- (3) Tests reflecting the **impact** of thyroid hormone on **tissues**;
- (4) Tests presenting **autoimmune** thyroid disease;
- (5) Tests providing information about thyroidal **iodine** metabolism.



Automated  
Immunoassay System



Electro-chemiluminescence  
Immunoassay (ECLIA) System



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# Thyroid Lab Tests

Thyroid-related Laboratory tests can be divided into five (5) major categories:

(1) Tests assessing Hypothalamus-Pituitary-Thyroid (**HPT**) axis

- TRH Stimulation Test
- TSH

(2) Tests estimating serum concentrations of **T4 & T3**

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• ANA • ds DNA • CCP • AMH • Folate • PTH

• CA 125 • CA 19-9 • CA 15-3

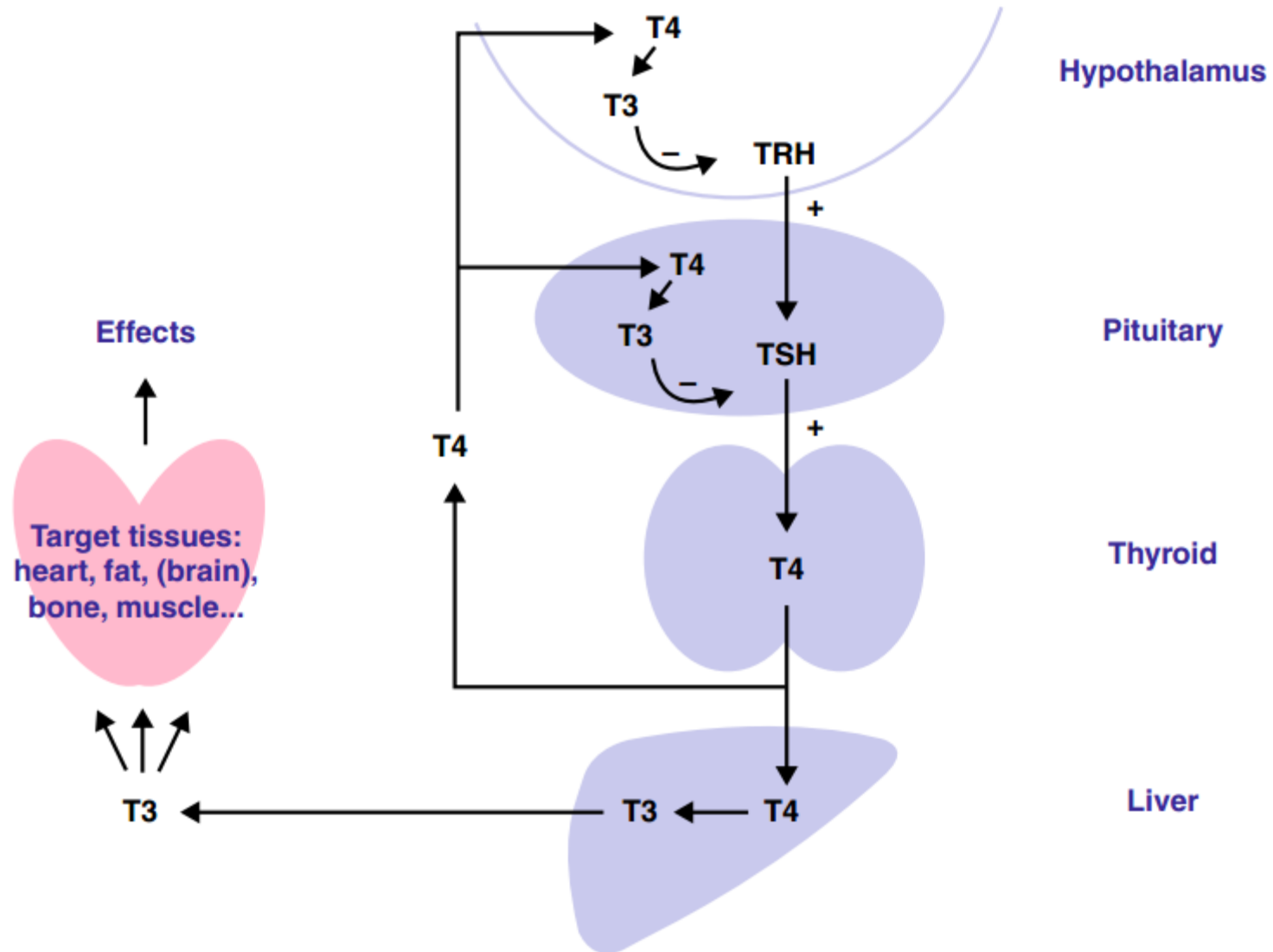
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# Hypothalamus-Pituitary-Thyroid-Peripheral tissues Axis



# TSH Assay

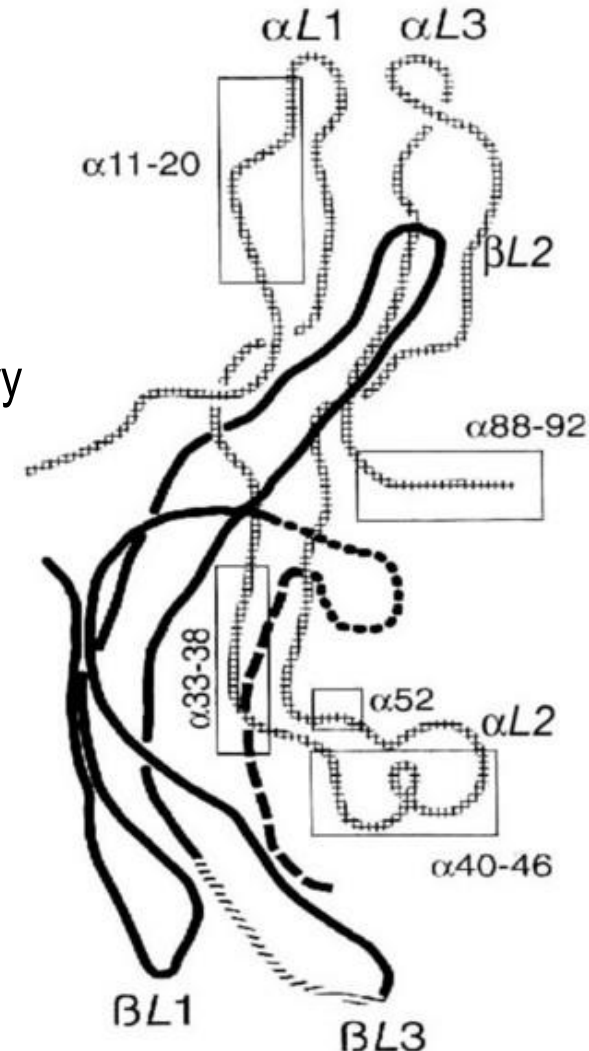


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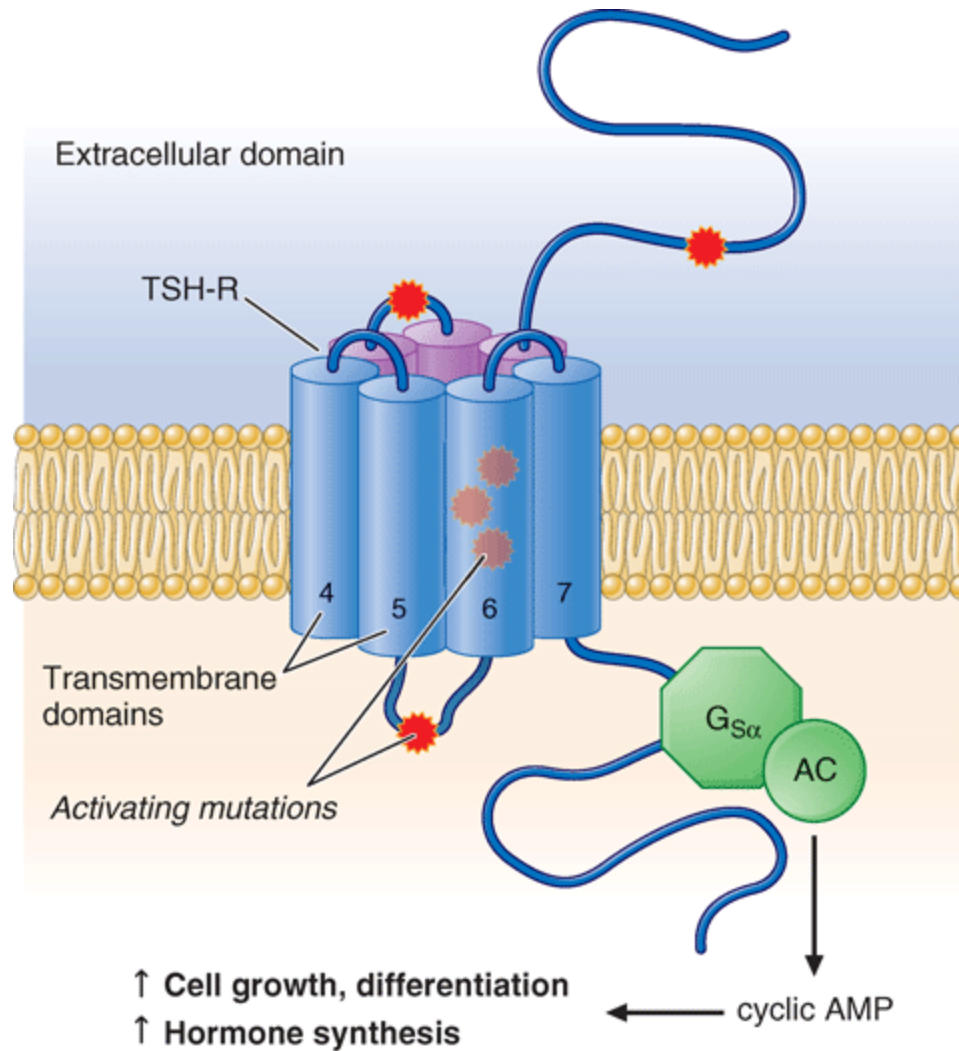
# Thyroid Stimulating Hormone (TSH)

- ✓ A heterodimeric glycosylated **peptide** ( $\alpha=92$ ,  $\beta=118$ )
- ✓  $M_w = 28$  to  $30$  kDa
- ✓ Synthesized & secreted from thyrotrophs of the anterior pituitary
- ✓ Turnover:  $40$ - $150$  mU/day
- ✓ Half Life:  $1$  hour
- ✓ Major role: Regulates the growth and function of thyroid gland





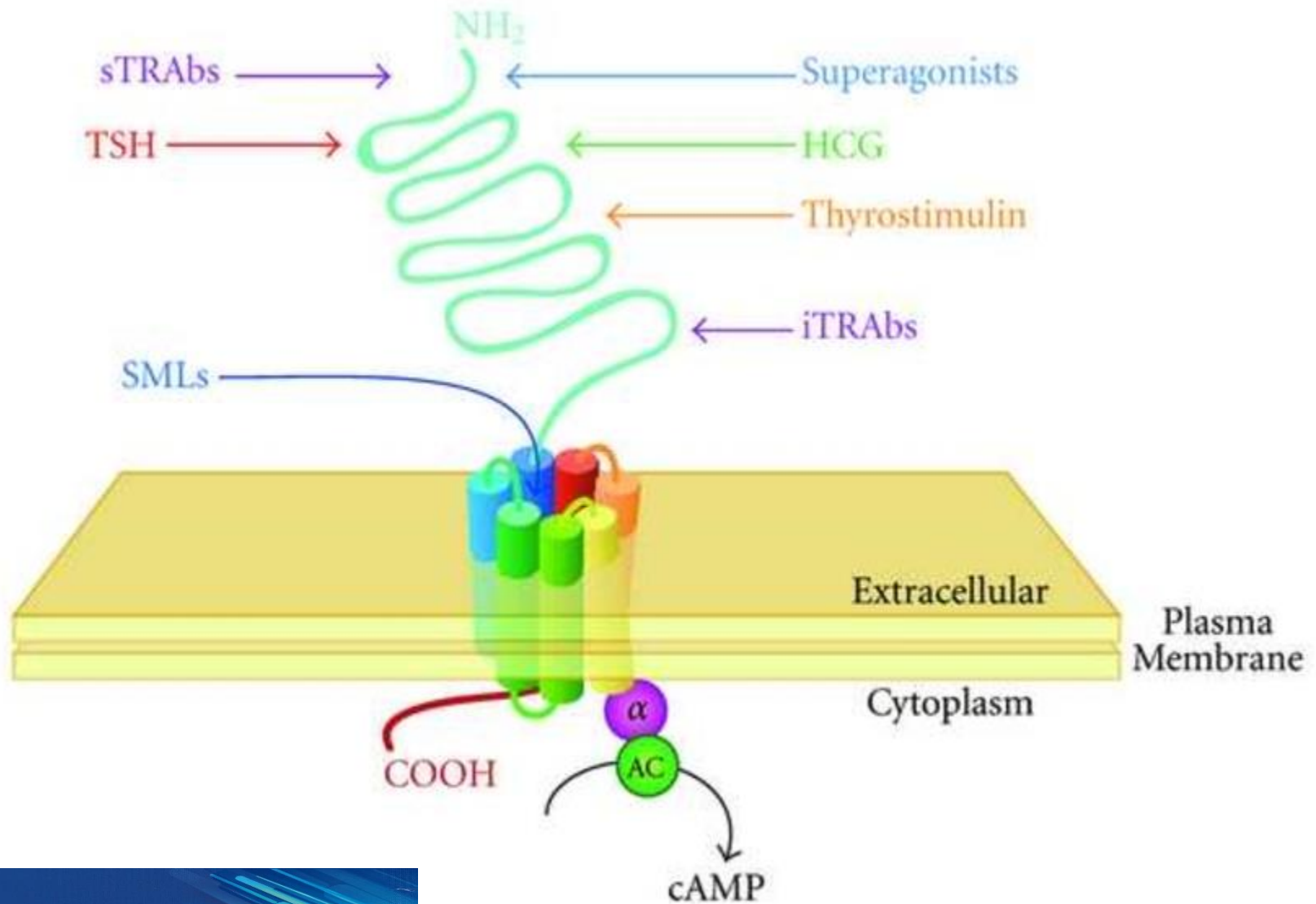
# TSH Receptor



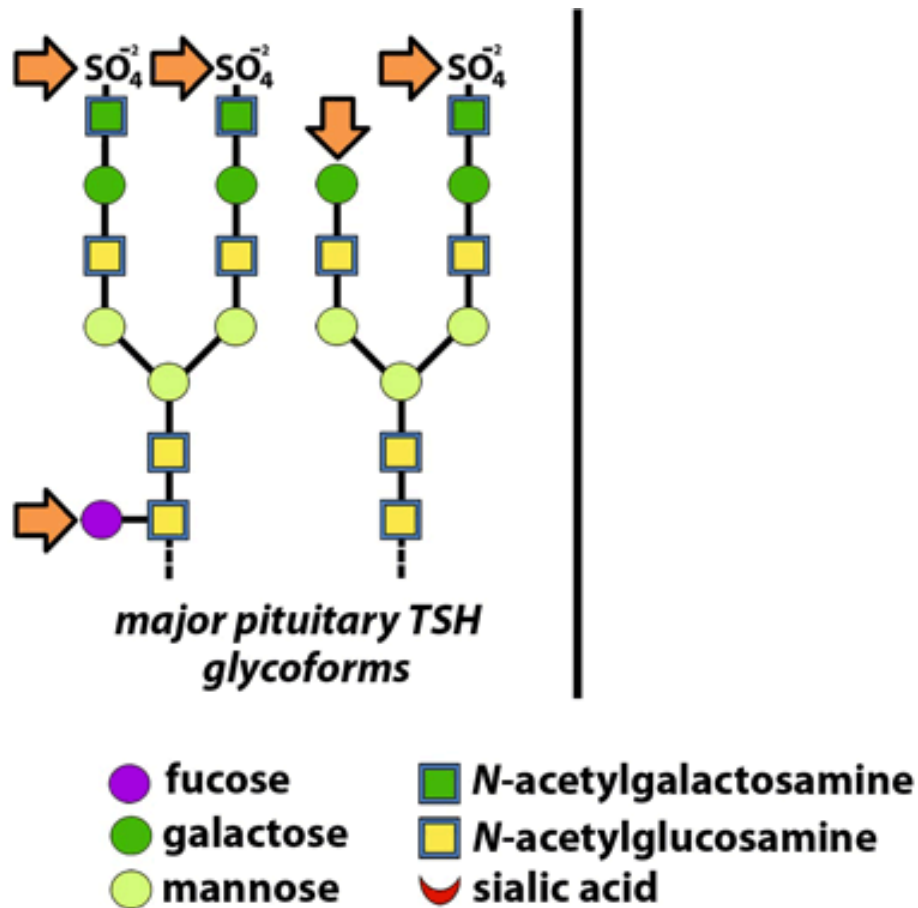
Source: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J: *Harrison's Principles of Internal Medicine*, 18th Edition: [www.accessmedicine.com](http://www.accessmedicine.com)

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# TSH Receptor



# Thyroid Stimulating Hormone (Glycobiology)



<https://www.aacc.org/publications/cln/articles/2013/may/tsh-harmonization>. Last seen: 4/23/2016



# TSH assay Functional Sensitivity

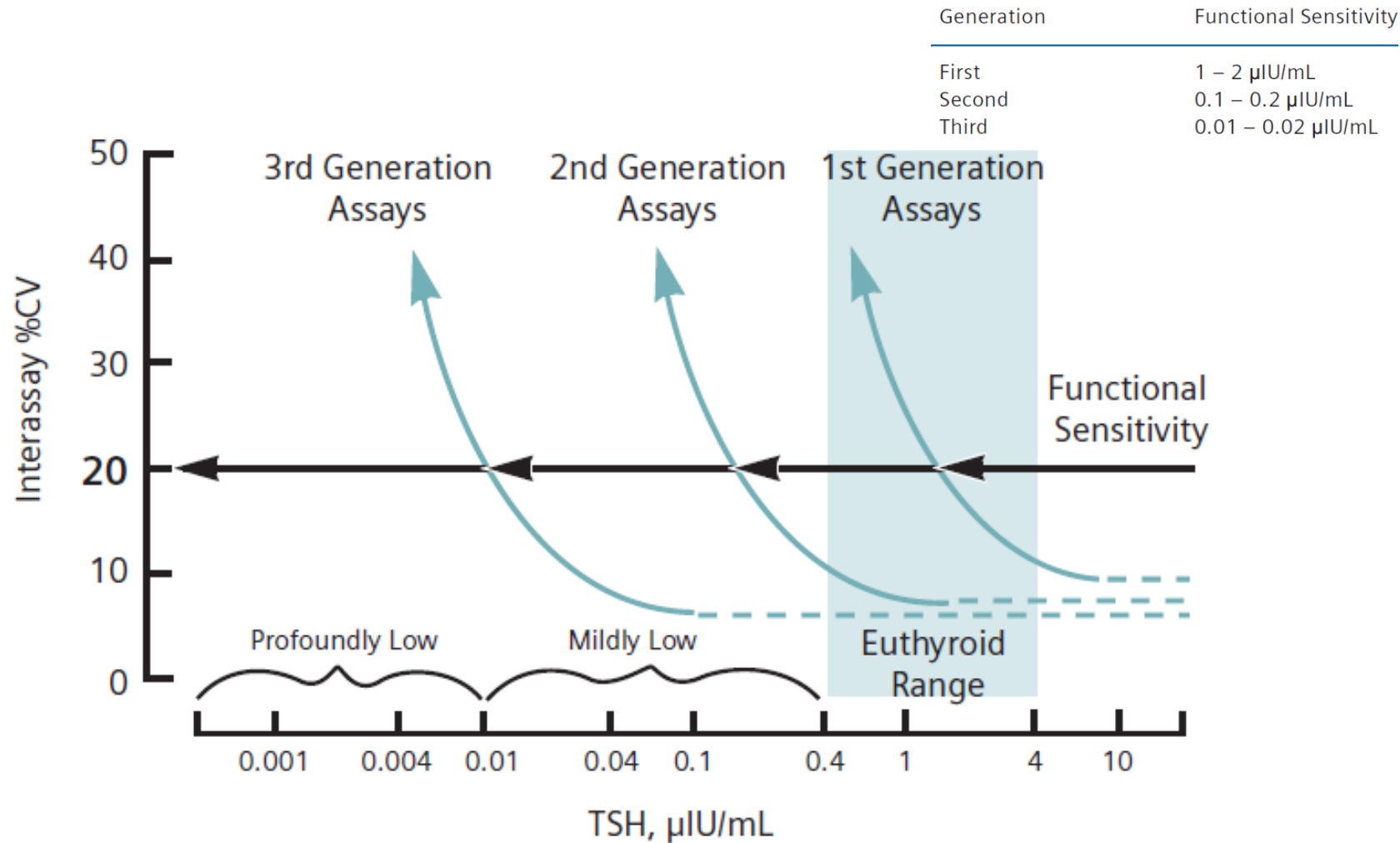
## (Assay Generations)

Generation	Functional Sensitivity*
First	1 – 2 $\mu\text{IU/mL}$
Second	0.1 – 0.2 $\mu\text{IU/mL}$
Third	0.01 – 0.02 $\mu\text{IU/mL}$
Fourth	0.001 – 0.002 $\mu\text{IU/mL}$

\*<20% interassay precision within these ranges.

Functional sensitivity is defined as the lowest concentration of TSH at which an interassay coefficient of variation of 20% can be achieved.

# TSH Functional Sensitivity (Assay Generations)



ATA: only TSH assays with 3<sup>rd</sup> generation functional sensitivity can be used as first line thyroid tests.

# TSH Assays

## (Methodologies)

- Bioassays

- Stimulation of colloid droplet formation in the guinea pig thyroid gland
- Release of labeled thyroidal iodide into mouse blood

- Immunoassays

- Hemagglutination Inhibition Test
- Radio Immuno Assay (RIA): 1<sup>st</sup>
- Immuno Metric Assays

Generation	Functional Sensitivity
First	1 – 2 $\mu$ IU/mL
Second	0.1 – 0.2 $\mu$ IU/mL
Third	0.01 – 0.02 $\mu$ IU/mL

### 1. Isotopic IMAs

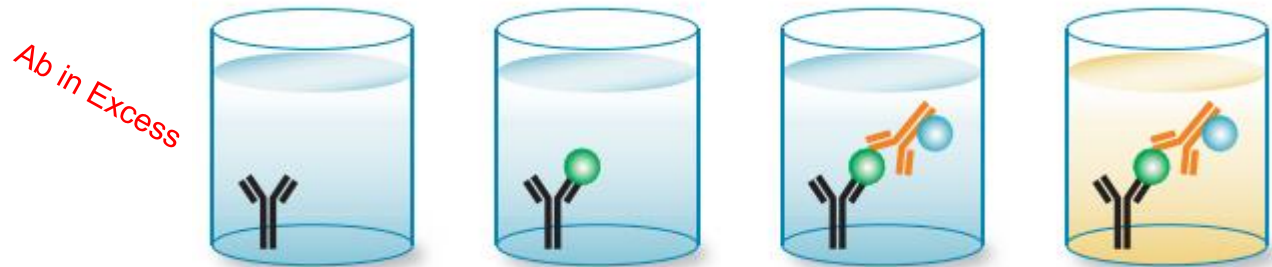
- Immuno RadioMetric Assay (IRMA): 2<sup>nd</sup>

### 2. Non-Isotopic IMAs

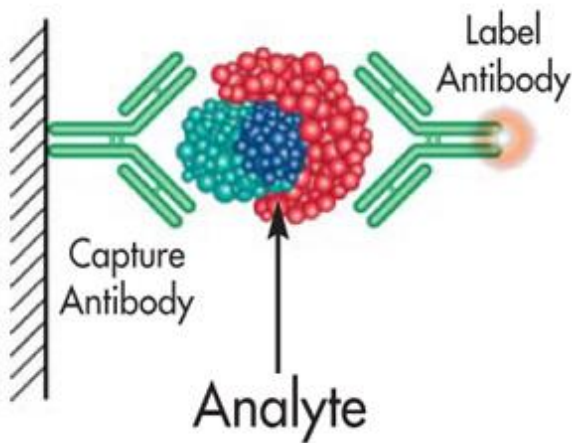
- Immuno EnzymoMetric Assays: 0.1-0.2 => 2<sup>nd</sup>
- Immuno FlouroMetric Assays
  - VIDAS System (ELFA): 0.05
- Immuno ChemiluminoMetric Assays: 0.01-0.02 => 3<sup>rd</sup>
  - Electro Chemi Luminescence IA (ECLIA): 0.014



# TSH Sandwich ELISA



<https://www.bio-rad-antibodies.com>



<http://scantibodies.com/hbr.html>

- Non-Isotopic IMAs
  - Improved sensitivity
  - Rapid turnaround time
  - wider linear measurement range
  - Rare Hook Effects
  - Safer\*

• ANA • ds DNA • CCP • AMH • Folate • PTH

• CA 125 • CA 19-9 • CA 15-3

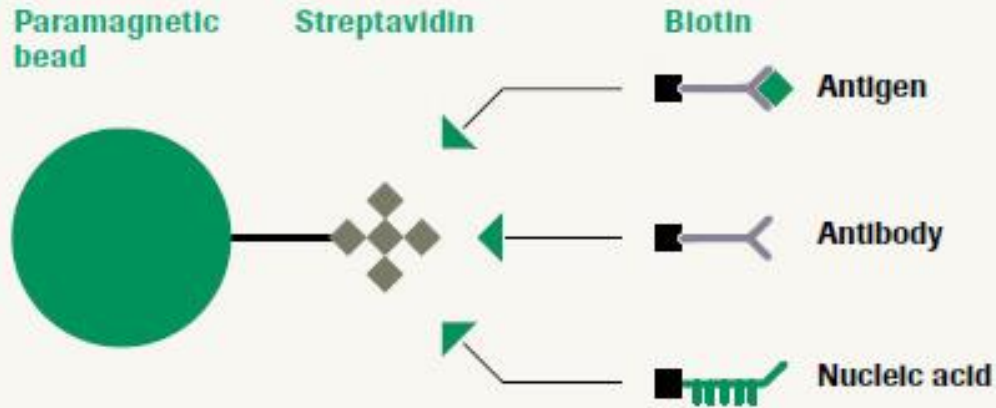
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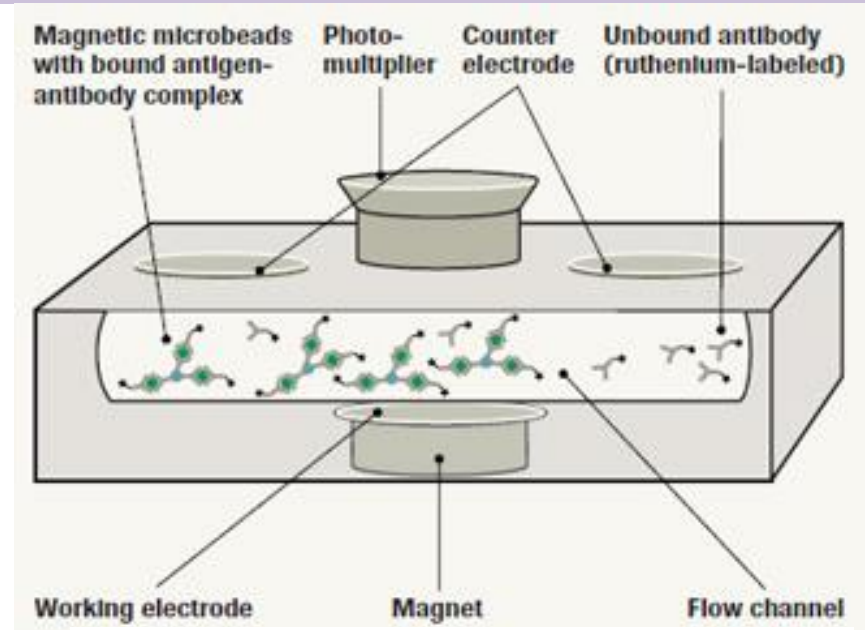
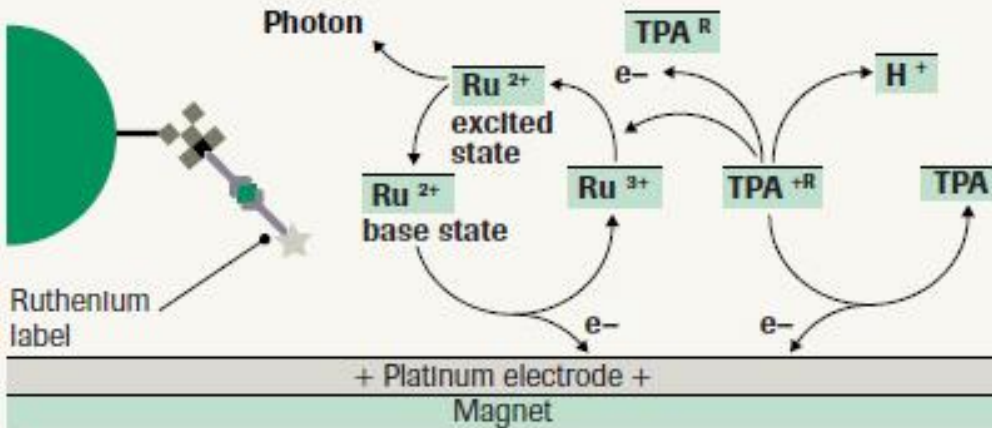
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# ECL Technology

### The basic principle



### Reaction phase-light generation



## Test Catalog

Search Go

Test Name

A	B	C	D	E	F
G	H	I	J	K	L
M	N	O	P	Q	R
S	T	U	V	W	X
Y	Z	#			

Test Catalog

Test Updates

[New Tests](#)

### Tests by Classification Type

### Test Setup Information

Performing Locations

## Ordering and Results

Utilization Manager

Specialties and Res

### Specimen Handling

### Education

## Outreach Resources

Customer Service

Test ID: STSH

Thyroid-Stimulating Hormone-Sensitive (s-TSH), Serum


## Overview

Specimen

Clinical and Interpretive

Performance	Fees and Coding	Test Setup
-------------	-----------------	------------

Share:    

Useful For 

Screening for thyroid dysfunction and detecting mild (subclinical), as well as overt, primary hypo- or hyperthyroidism in ambulatory patients

### Monitoring patients on thyroid replacement therapy

Confirmation of thyroid-stimulating hormone (TSH) suppression in thyroid cancer patients on thyroxine suppression therapy

#### Prediction of thyrotropin-releasing hormone-stimulated TSH response

## Testing Algorithm

See Thyroid Function Ordering Algorithm in Special Instructions.

Special Instructions ⓘ

- Thyroid Function Ordering Algorithm

Method Name 

### Electrochemiluminescent Immunoassay

# TSH assay facts

- **Patient Preparation:** For **12 hours before this blood test do not** take multivitamins or dietary supplements containing biotin (vitamin B7), which is commonly found in hair, skin, and nail supplements and multivitamins.
- Sample: Serum/plasma (50-200 µL)
- Preferred Storage:
  - Refrigerated (7 days)\*
  - Frozen (30 days)
  - Ambient (7 days)
- Reject Due To
  - Hemolysis: Mild OK; Gross reject
  - Lipemia: Mild OK; Gross OK
  - Icterus: Mild OK; Gross OK
- Preferred Procedure in USA: Electro ChemiLuminescent Immunoassay
  - ARUP Laboratories
  - Mayo Clinic Lab

TSH RCPA TEa:

upto 0.5 mU/L	± 0.1
> 0.50 mU/L	20%

<http://www.rcpaqap.com.au/docs/2014/chempath/ALP.pdf>

# TRH Stimulation Test



**Hipro®**

Automated  
Immunoassay System



**Lifotronic**

Electro-chemiluminescence  
Immunoassay (ECLIA) System



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شرکت بنیان درمان  
تلفن: ۰۵۰-۳۸۸۷۰۳۰ (خط ۱۰)

• ANA • ds DNA • CCP • AMH • Folate • PTH

NEW KITS

• CA 125

• CA 19-9

• CA 15-3

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**IDEAL**  
TASHKHIS ATIEH

# TRH Stimulation Test

1. A baseline TSH test is done.
  2. Then an injection of TRH, which stimulates the pituitary to release TSH.
  3. A second blood sample is drawn 20 to 30 minutes later, and the TSH level is retested.
- TRH is known generically as protirelin (Thyrel),
  - *The TSH test is a picture in time of circulating levels of thyroid hormone. But by challenging the thyroid, the TRH Stimulation Test evaluates the thyroid's actual ability to function in real life.*
  - The TRH test is occasionally used to help identify secondary hypothyroidism (hypothyroidism due to pituitary problems) and tertiary hypothyroidism (hypothyroidism due to hypothalamic disorder).
  - *The test is important when traditional TSH tests results are borderline, and when a patient has obvious thyroid symptoms but normal TSH results.*
  - *In some individuals (and depending on the physician's interpretation of the laboratory tests), outright hypothyroidism may take as long as 20 years to develop. With the help of measures such as the TRH stimulation test, one is able to diagnose hypothyroidism when the onset of symptoms (fatigue, weight gain, etc.) precedes abnormal laboratory values. Early intervention thus may save patients from years of needless suffering.*



# TRH Stimulation Test

- **Previous Indications:**
  1. to discriminate between hypothalamic and pituitary causes of TSH deficiency
  2. differential the diagnosis of hyperthyroidism
  3. for the demonstration of residual abnormal somatotropin-secreting cells in acromegalic patients who release GH in response to TRH before treatment
- **Procedure:**
  1. Baseline TSH
  2. an injection of TRH, which stimulates the pituitary to release TSH
  3. Retesting TSH 20 to 30 minutes later
- **Current Indications:**
  - uncommon since the development of ultrasensitive assays for TSH



# Magnüs microscopes



- Anti fungus optics
- Plan superior imaging
- Rackless stage for durability and ease of use
- Ergonomic and compact design for user convenience
- Aspheric light relay system for bright and uniform illumination

MX21i

CLINICAL MICROSCOPE

Optional Accessories



Dual Filter (DIF)



Trinocular Head With USB Digital Camera

شرکت بنیان درمان  
تلفن: ۰۲۰-۸۸۷۰۳۰۵۰ (خط ۱)

- ANA
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تولید کننده

NEW KITS

• کیت‌های تشخیص طبی الایزا



ژال تجهیز

## دیپارتمان آموزش و پژوهش

## انجمن دکترای علوم آزمایشگاهی

Education and Research  
Department of DCLS  
Association of Iran

## تشخیص طبی ایران



انجمن علمی دکترای علوم آزمایشگاهی  
تشخیص طبی ایران



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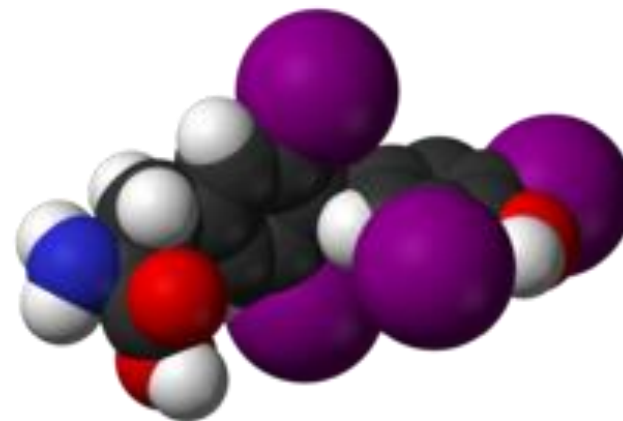
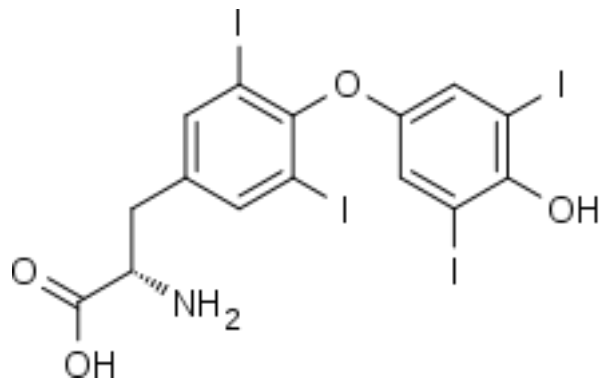
# T4 & T3 assays





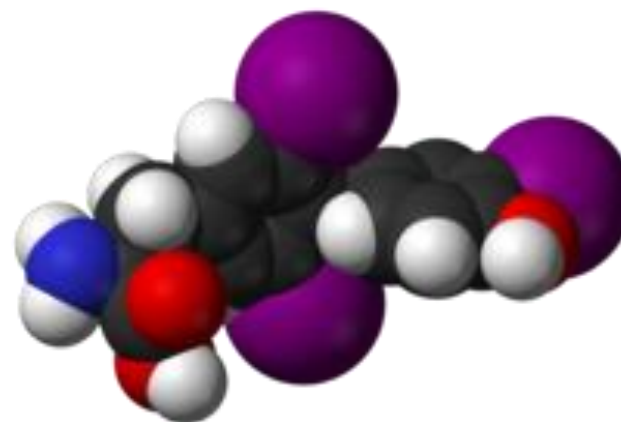
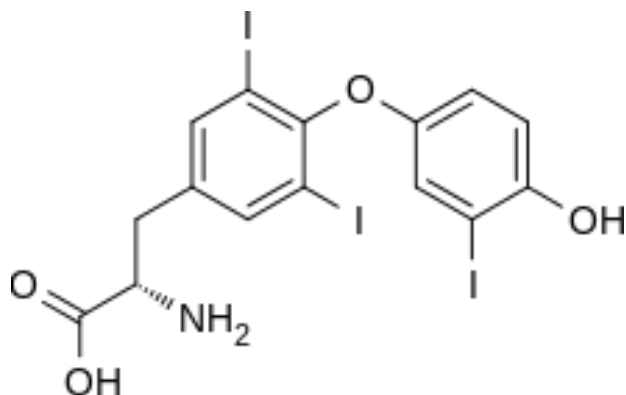
# T3 (Triiodothyronine) & T4 (Thyroxine)

## Molecular Structures



The structural formula (left) and a space-filling model (right) of (S)-thyroxine (T4.). **MW=776.87**

---



The structural formula (left) and a space-filling model (right) of (S)-triiodothyronine (T<sub>3</sub>, also called [liothyronine](#) in the pharmaceutical industry). **MW=650.978**

# Comparison of T3 and T4 in Humans

Parameter	T <sub>3</sub>	T <sub>4</sub>
Production rate (nmol/day)	50	110
Fraction from thyroid	0.2	1.0
Relative metabolic potency	1.0	0.3
Serum concentration		
Total (nmol/L)	1.8	100
Free (pmol/L)	5	20
Fraction of total hormone in free form ( $\times 10^{-2}$ )	0.3	0.02
Distribution volume (L)	40	10
Fraction intracellular	0.64	0.15
Half-life (days)	0.75	6.7

To convert T4 from nmol/L to  $\mu\text{g/dL}$  (total) or pmol/L to ng/dL (free), divide by 12.87. To convert T3 from nmol/L to ng/dL (total) or pmol/L to pg/dL (free), multiply by 65.1.

# T4 & T3 assay facts

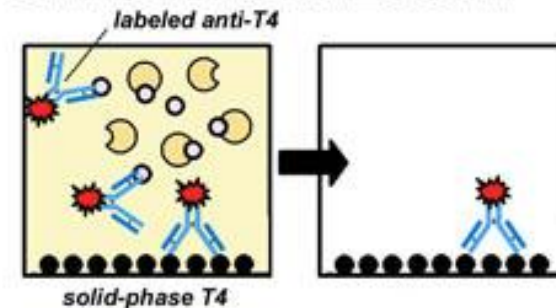
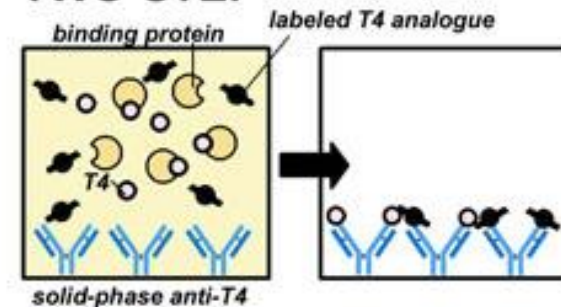
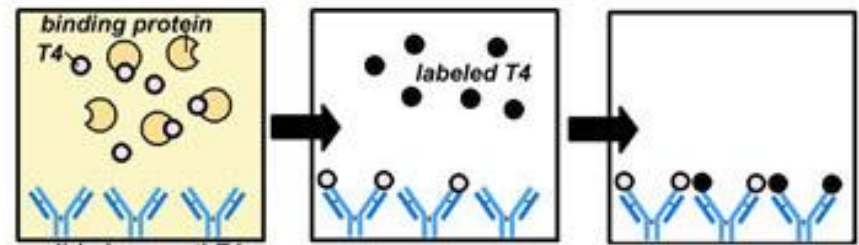
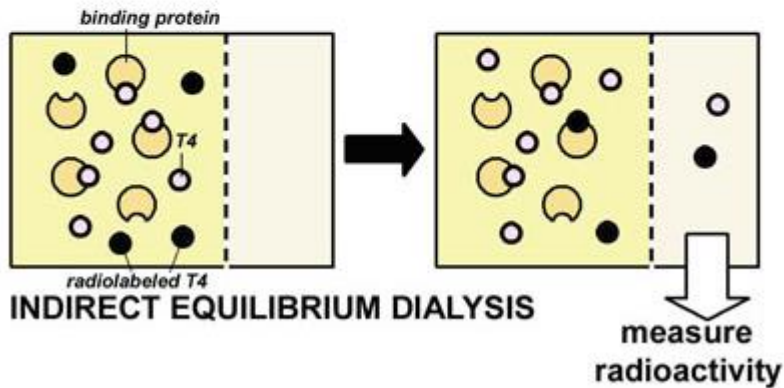
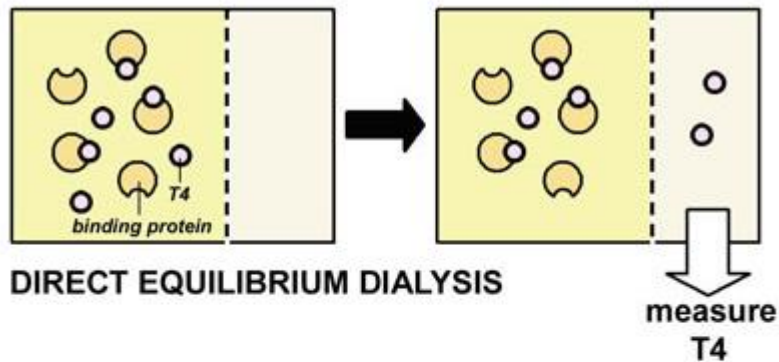
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  - Mayo Clinic Lab
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  - Hemolysis: Mild OK; Gross Reject
  - Lipemia: Mild OK; Gross OK
  - Icterus: Mild OK; Gross OK
- Standardization available

T4 RCPA TEa:	
up to 120 nmol/L	± 12
> 120 nmol/L	10%

T3 RCPA TEa:	
up to 1.3 nmol/L	± 0.2
> 1.3 nmol/L	15%

<http://www.rcpaqap.com.au/docs/2014/chempath/ALP.pdf>

# Free T4 Assays



# Medications displacing T4 from TBG

**Table 5.2** Principal medications that displace T4 from TBG binding in normal human serum

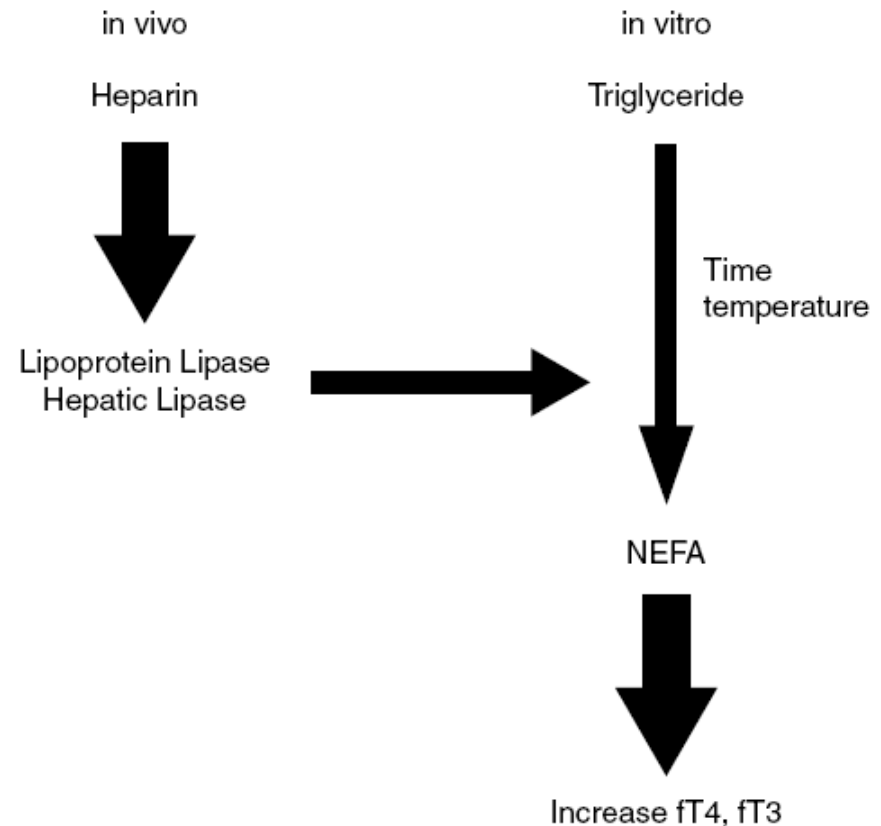
Medication	Mean percent increase in free T4 fraction*
Salicylates	
• Acetyl salicylic acid (aspirin)	62
• Salicyl salicylic acid (salsalate)	>100
Furosemide <sup>#</sup>	5–30
Fenclofenac	90
Mefenamic acid	31
Flufenamic acid	10
Diclofenac	7
Diflunisal	37
Phenytoin	45
Carbamazepine	30



# T4 displacement by Heparin & TG

**Heparin-induced lipolysis during sample incubation can markedly increase the apparent concentration of serum free T4.**

1. Heparin acts *in vivo* (left) to liberate lipoprotein lipase from vascular endothelium.
2. Lipase acts *in vitro* (right) to increase the concentration of non-esterified fatty acids (NEFA).
3. In normal serum, NEFA concentrations >3 mmol/L, will displace T4 and T3 from TBG and thus increase apparent free T4.
4. *In vitro* generation of NEFA is increased by incubation at 37°C and with high serum concentrations of triglyceride.
5. The T4-displacing effect of NEFA is accentuated at low albumin concentrations



# FT4 & FT3 assay facts

- **Patient Preparation:** For **12 hours before this blood test do not** take multivitamins or dietary supplements containing biotin (vitamin B7), which is commonly found in hair, skin, and nail supplements and multivitamins.
- Sample: Serum/plasma (50-200 µL)
- Preferred Storage:
  - Refrigerated (14 days)\*
  - Frozen (30 days)
  - Ambient (72 hours)
- Preferred Procedure in USA: Electro ChemiLuminescent Immunoassay
  - ARUP Laboratories
  - Mayo Clinic Lab
- Reject Due To
  - Hemolysis: Gross OK
  - Lipemia: Mild OK; Gross OK
  - Icterus: Mild OK; Gross OK

FT4 RCPA TEa:

up to 12 pmol/L  $\pm 1.5$

> 12 pmol/L 12%

FT3 RCPA TEa:

up to 3.5 pmol/L  $\pm 0.7$

> 3.5 pmol/L 20%

<http://www.rcpaqap.com.au/docs/2014/chempath/ALP.pdf>

- Standardization available



Automated  
Immunoassay System



Electro-chemiluminescence  
Immunoassay (ECLIA) System



Magnus

Clinical & Research  
Microscopes

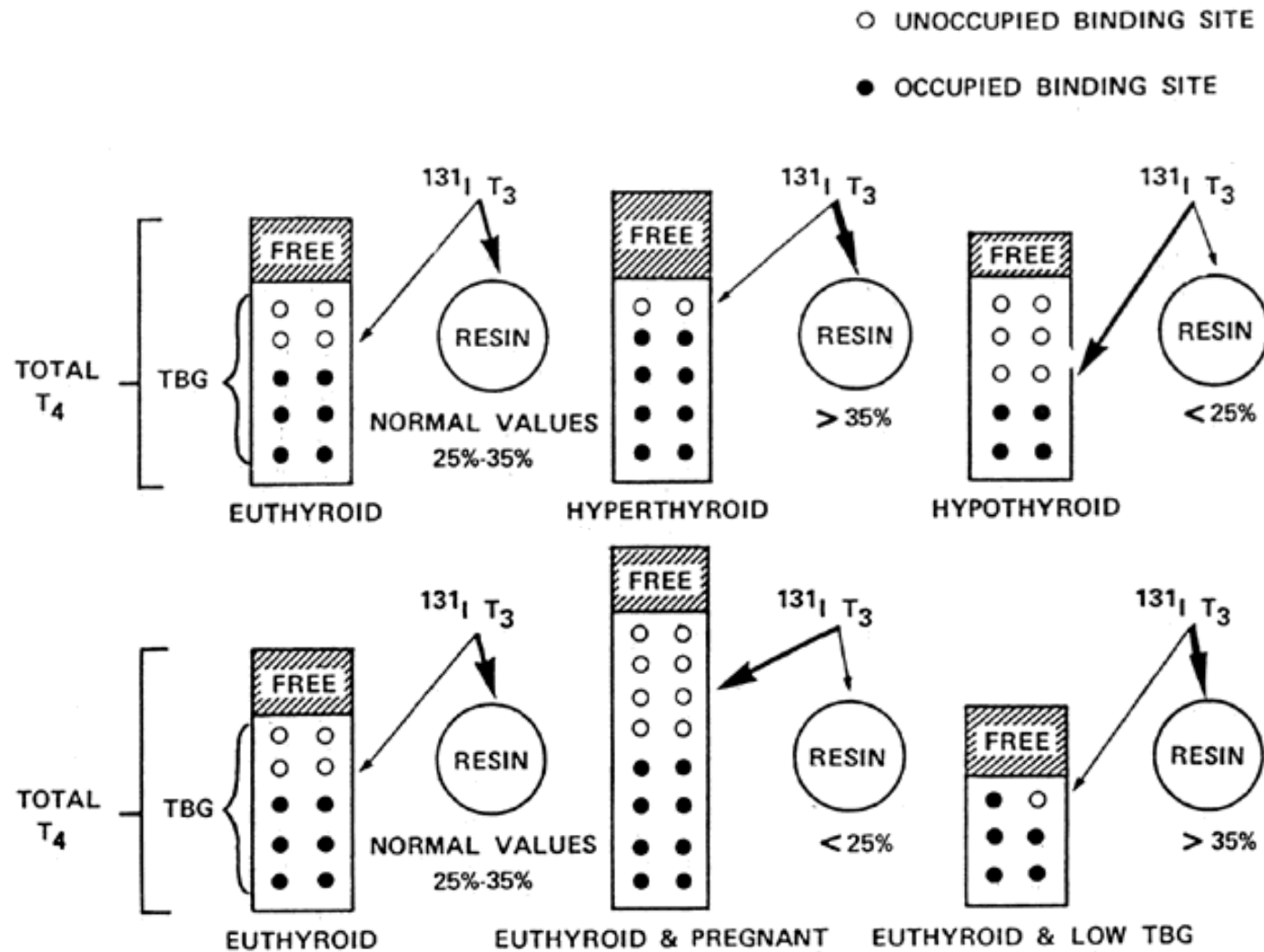


شرکت بنیان درمان  
تلفن: ۰۵۰۰۲۰۸۸۷ (خط ۱۰)

# Free Thyroxin Index (FTI)



# ResinT3 Uptake assay



# Transformation of T-Uptake Units to %Uptake

- The transformed %Uptake values may differ from measured %T3 Uptake values on a given specimen for a number of reasons:
- The two assays measure different parameters of thyroxine binding proteins:
  - T-Uptake – Total binding capacity of TBG.
  - %T3 Uptake – Unsaturated binding capacity of binding proteins.
- T-Uptake levels for Hypothyroid and Hyperthyroid subjects are generally within the normal range.
- %T3 Uptake is sensitive to both binding protein concentration and T4 levels.

$$\text{Transformed \%Uptake} = \frac{\text{MEAN NORMAL RANGE}}{\sqrt{0.8(\text{T-Uptake Units})^2 + 0.2}}$$

$$\text{MEAN NORMAL RANGE} = \frac{\text{LOW NORMAL} + \text{HIGH NORMAL}}{2}$$

$$\text{T-Uptake Units} = \sqrt{\frac{(\text{MEAN NORMAL RANGE} / \%Uptake)^2 - 0.2}{0.8}}$$

# Free Thyroxine Index (FTI)

- The FTI value can be calculated with any of the following formulas:

- $\frac{\text{Total T}_4}{\text{T-Uptake Unit}}$
- $\text{Total T}_4 \times \% \text{Uptake}$
- $\text{Total T}_4 \times \frac{\% \text{Uptake}}{100\%}$

Thyroid Function Test	Measurement	Normal Range
Total T4 (TT4)	bound <b>and</b> free T4	4.5 -11.5 ug/dL
Free T4 (FT4)	free T4	0.8 -2.8 ng/dL
Free T4 Index (FT4I)	estimate of free T4 FT4I = TT4 x RT3U	1.0 -4.3 U
Total T3 (TT3)	bound and free T3	75 -200 ng/dL
Resin T3 Uptake (RT3U)	binding capacity of TBG	25 -35%
TRH	TRH	5 -25 mIU/mL
TSH	TSH	0.3 - 5.0 U/mL
Thyroglobulin	Thyroglobulin	5-25 ng/mL
Radioactive Iodine Uptake (RAIU)	Distribution of radiolabeled iodine in the thyroid	5 hr – 5 to 15% 24 hr – 15 to 35%

$$\text{FTI} = \text{TT4} \times \% \text{Uptake} / 100$$

FTI Unit: ?

- Same as T4.  
RI= 1.3 – 4 µg/dL

- TBI:  
 $\text{FTI} = \text{T4} \times \text{THBR} (\text{T3 Uptake/Normal T3 Uptake})$   
RI= 0.85 - 1.1



# Free Thyroxin Index facts

- **Patient Preparation:** For **12 hours before this blood test do not** take multivitamins or dietary supplements containing biotin (vitamin B7), which is commonly found in hair, skin, and nail supplements and multivitamins.
- Sample: Serum/plasma (50-200 µL)
- Preferred Storage:
  - Refrigerated (7 days)\*
  - Frozen (30 days)
  - Ambient (72 hours)
- Preferred Procedure in USA: Electro ChemiLuminescent Immunoassay
  - ARUP Laboratories
  - Mayo Clinic Lab
- Reject Due To
  - Hemolysis: Mild OK; Gross OK
  - Lipemia: Mild OK; Gross OK
  - Icterus: Mild OK; Gross OK



Products	Thyroid Panel	Tumor Markers
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
Infectious Diseases	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
Rheumatology	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
Allergy	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free



Products	Thyroid Panel	Tumor Markers
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
Infectious Diseases	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
Rheumatology	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
Allergy	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free
	T4 Free	T4A Free

# Thyroid Lab Tests

Thyroid-related Laboratory tests can be divided into five (5) major categories:

(1) Tests assessing Hypothalamus-Pituitary-Thyroid (HPT) axis

(2) Tests estimating serum concentrations of T4 & T3

**(3) Tests reflecting the impact of thyroid hormone on tissues;**

- CBC
- Lipid Panel
- Basic Metabolic Panel (Glucose, Creatinine, Electrolytes, CO2, Cl)
- SGOT, SGPT, CPK
- Prolactin
- ....

(4) Tests presenting **autoimmune** thyroid disease;

(5) Tests providing information about thyroidal **iodine** metabolism.



# Tests reflecting the impact of thyroid hormone on tissues

- The complete blood count and metabolic profile may show abnormalities in patients with hypothyroidism.
  - anemia,
  - dilutional hyponatremia,
  - hyperlipidemia,
  - increases in serum creatinine (reversible)
- Elevations in transaminases and creatinine kinase (CK) have also been found in hypothyroidism
- Primary hypothyroidism causes an elevation of TRH,
  - which can cause an elevation of prolactin along with TSH.
  - Prolactin levels in patients with hypothyroidism tend to be lower than those usually seen with prolactinomas (the latter are usually 150-200 ng/mL or higher).

# Thyroid Lab Tests

Thyroid-related Laboratory tests can be divided into five (5) major categories:

(1) Tests assessing Hypothalamus-Pituitary-Thyroid (HPT) axis

(2) Tests estimating serum concentrations of **T4 & T3**

(3) Tests reflecting the **impact** of thyroid hormone on **tissues**;

**(4) Tests presenting autoimmune thyroid disease;**

- Auto Abs (Anti Thyroid Abs)
  - Anti-TPO Abs
  - Anti-Tg-Abs
  - Anti-TSH Receptor (TSHR) Abs\*
    - Stimulatory
    - Inhibitory
- Tissue Inflammation

(5) Tests providing information about thyroidal **iodine** metabolism.

# Anti Thyroid Auto Antibodies

Parameter	Antibodies		
	Anti-TSHR	Anti-TPO	Anti-Tg
Antigen location	Extracellular	Intracellular	Intrafollicular, low levels in blood circulation
Access of immune cells to antigen	Without tissue destruction	After thyrocyte destruction	With and without tissue destruction
Duration of antigen exposure	Short, low levels (normalization upon treatment)	Prolonged time, intermediate levels (pathologic levels also upon treatment)	Prolonged time, high levels (pathologic levels also upon treatment)
Type of antibody	Oligoclonal, different epitopes	Polyclonal, one domain immunodominant	Polyclonal, different epitopes
Class of antibody	Mainly IgG1, other subclasses to low extent	IgG1, IgG4 > IgG2, IgG3; low levels of IgA	IgG1, IgG4 > IgG2, IgG3; low levels of IgA and IgM (healthy individuals)
Action on neonate	Transplacental passage; transient hyperthyroidism or hypothyroidism with delayed development of thyroid gland	Transplacental passage; potential effects on cognitive development	Transplacental passage; potential effects on cognitive development
Prevalence in AITD	~90% GD; ~10% HT	>80% in GD and HT	>50% in GD and HT
Prevalence in other AD	Usually no expression, one study 18% in T1DM	16–37% RA; 40% T1DM; 12–30% CD	12–23% RA; 30% T1DM; 11–32% CD
Action of antibodies	Stimulating, blocking, apoptosis	Little action <i>per se</i>	No defined action
Extra-thyroidal targets	Few, defined effects (GO, GDP), partly known mechanism	Several, ill-defined actions (HE, breast cancer), mechanism of action not known	No specific targets identified
Action in breast cancer progression	No protective effect	Potential protective effects	Potential protective effects

*TSHR, thyroid-stimulating hormone receptor; TPO, thyroid peroxidase; Tg, thyroglobulin; CD, celiac disease; GD, Graves' disease; GDP, Graves' dermopathy; GO, Graves' orbitopathy; HT, Hashimoto's thyroiditis; RA, rheumatoid arthritis; T1DM, type 1 diabetes mellitus; AITD, autoimmune thyroid disease; AD, autoimmune diseases; HE, Hashimoto's encephalopathy.*

# Thyroperoxidase (TPO) Antibodies (Anti-TPO)





# Anti-TPO assay

- Thyroperoxidase (TPO): an enzyme catalyzing the oxidation of iodide on tyrosine residues in thyroglobulin for the synthesis of T3 and T4
- TPO is a membrane-associated **hemoglycoprotein** expressed only in thyrocytes and is one of the most important thyroid gland antigens.
- Anti-TPO antibodies activate complement and are thought to be significantly involved in thyroid dysfunction and the pathogenesis of hypothyroidism.
- TPO antibody assay: the most sensitive test for detecting autoimmune thyroid disease (eg, Hashimoto thyroiditis, idiopathic myxedema, and Grave's disease)
- The highest TPO antibody levels are observed in patients suffering from Hashimoto thyroiditis (prevalence= about 90% of cases).
- Anti-TPO antibodies also frequently occur (60%–80%) in the course of Grave's disease.
- In patients with subclinical hypothyroidism, the presence of TPO antibodies is associated with an increased risk of developing overt hypothyroidism. Many clinical endocrinologists use the TPO antibody test as a diagnostic tool in deciding whether to treat a patient with SC hypothyroidism.

# Anti-TPO assay facts

- **Patient Preparation:** For **12 hours before this blood test do not** take multivitamins or dietary supplements containing biotin (vitamin B7), which is commonly found in hair, skin, and nail supplements and multivitamins.
- Sample: Serum/plasma (50-200 µL)
- Preferred Storage:
  - Refrigerated (7 days)\*
  - Frozen (30 days)
- Preferred Procedure in USA: Chemiluminometric Immunoassay
  - ARUP Laboratories
  - Mayo Clinic Lab
- Reject Due To
  - Hemolysis: Mild OK; Gross reject
  - Lipemia: Mild OK; Gross OK
  - Icterus: NA
- RI= < 9.0 IU/mL
- Moderately increased levels of TPO antibodies may be found in patients with non-thyroid autoimmune disease such as pernicious anemia, type I diabetes, or other disorders that activate the immune system.

# Thyroglobulin (Tg) Antibodies (Anti-Tg)



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— Simple, Rapid, Accurate  
— Portable near to patient



# Anti-Tg assay

- Thyroglobulin autoantibodies bind thyroglobulin (Tg), a major thyroid-specific protein. Tg plays a crucial role in thyroid hormone synthesis, storage, and release.
- Tg leakage into the systemic circulation: follicular destruction through inflammation (thyroiditis and autoimmune hypothyroidism), hemorrhage (nodular goiter), or rapid disordered growth of thyroid tissue, as may be observed in Graves disease or follicular cell-derived thyroid neoplasms
- This results in the formation of anti-Tg in some individuals. The same processes also may result in exposure of other "hidden" thyroid antigens to the immune system, resulting in the formation of autoantibodies to other thyroid antigens, in particular thyroid peroxidase (TPO) (anti-TPO).
- In individuals with autoimmune hypothyroidism, 30% to 50% will have detectable anti-Tg autoantibodies, while 50% to 90% will have detectable anti-TPO autoantibodies. In Graves disease, both types of autoantibodies are observed at approximately half these rates.
- The presence of anti-Tg, which occurs in 15% to 30% of thyroid cancer patients, could result in misleading Tg results.
- Measurements of anti-TPO have higher sensitivity and equal specificity to anti-Tg measurements in the diagnosis of autoimmune thyroid disease. Anti-Tg levels should, therefore, only be measured if anti-TPO measurements are negative, but clinical suspicion of autoimmune thyroid disease is high.

# Anti-Tg assay facts

- **Patient Preparation:** For **12 hours before this blood test do not** take multivitamins or dietary supplements containing biotin (vitamin B7), which is commonly found in hair, skin, and nail supplements and multivitamins.
- Sample: Serum/plasma (50-200 µL)
- Preferred Storage:
  - Refrigerated (7 days)\*
  - Frozen (30 days)
- Preferred Procedure in USA: Immunoenzymatic Assay
  - Mayo Clinic Lab
- Reject Due To
  - Hemolysis: Mild OK; Gross reject
  - Lipemia: Mild OK; Gross OK
  - Icterus: NA
- RI= < 4.0 IU/mL
- In immunometric assays, the presence of thyroid antibody can lead to false-low measurement; whereas it might lead to false-high results in competitive assays.

# Anti TSH-R Antibodies



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Anemia		Allergy
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Rheumatology	Vasculitis	Infectious Diseases

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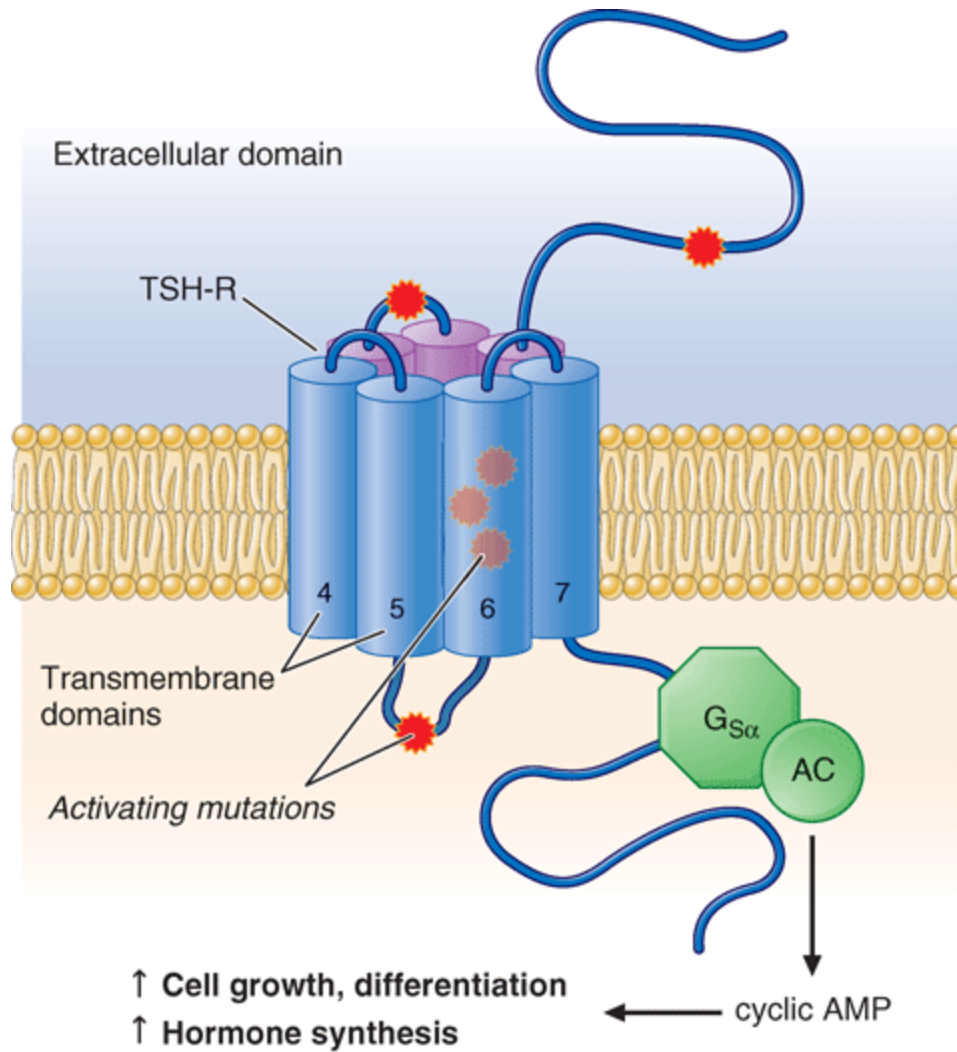
- Dark Field (BX-DF)
- Transducer Mount with Cold Light Camera

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شرکت بنیان درهان  
تلفن: ۰۲۰-۸۸۷۰۰۰۰۰ (خط ۱۰ خط)



# TSHR



Source: Longo DL, Fauci AS, Kasper DL, Hauser SL, Jameson JL, Loscalzo J: *Harrison's Principles of Internal Medicine*, 18th Edition: [www.accessmedicine.com](http://www.accessmedicine.com)

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# Anti TSH-R Antibodies (TSHR-antibody)

- Autoantibodies that bind and transactivate the TSHR lead to stimulation of the thyroid gland independent of the normal feedback-regulated thyroid-stimulating hormone (TSH) stimulation.
- These TSHR autoantibodies also are known as long-acting-thyroid-stimulator (LATS) or **Thyroid-Stimulating Immunoglobulins (TSI)**.
- Some patients with Graves disease also have **TSHR-blocking** antibodies, which do not transactivate the TSHR.
- The balance between TSI and TSHR-blocking antibodies, as well as their individual titers, are felt to be determinants of Graves disease severity.
- At least 20% of patients with autoimmune hypothyroidism also have evidence either of TSHR-blocking antibodies or, less commonly, TSI.
- First-order tests for autoimmune thyroid disease include TPO Antibodies (most suited for suspected cases of autoimmune hypothyroidism) and TSHR-antibody, a binding assay that detects both TSI and TSHR-blocking autoantibodies; it can be used instead of TSI assay for most applications, as long as the results are interpreted in the clinical context.
- The TSHR-antibody test has a shorter turnaround time than the TSI assay, is less expensive, less analytical variability and if interpreted within the clinical context, has excellent correlation with the TSI assay.
- Specific detection of TSI is accomplished by this second-order bioassay.

# TSHR-antibody assay facts

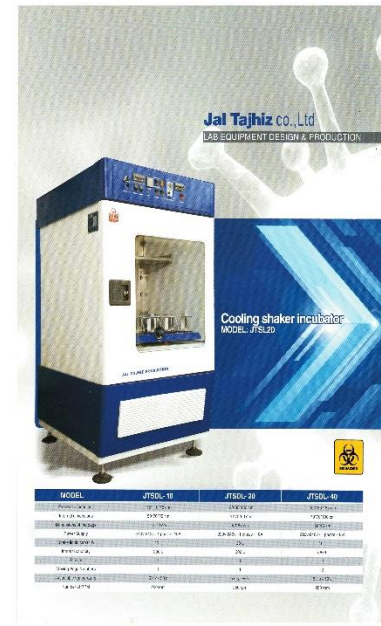
- **Patient Preparation:** For **12 hours before this blood test do not** take multivitamins or dietary supplements containing biotin (vitamin B7), which is commonly found in hair, skin, and nail supplements and multivitamins. Do not use specimens from patients receiving heparin treatment. In rare cases, interference due to extremely high titers of antibodies to streptavidin and ruthenium can occur.
- Sample: Serum/plasma (50-200 µL)
- Preferred Storage:
  - Refrigerated (7 days)
  - Frozen (30 days) \*
- Preferred Procedure in USA : Electrochemiluminescence Immunoassay
  - Mayo Clinic Lab
- Reject Due To
  - Hemolysis: Mild OK; Gross reject
  - Lipemia: Mild OK; Gross OK
  - Icterus: Mild OK; Gross OK
- RI= < or = 1.75 IU/L
- A sensitivity of 97% and a specificity of 99% for detection of Grave's disease
- An elevated TRAb test at the conclusion of a course of anti-thyroid drug treatment is highly predictive of relapse of Grave's disease. However, the converse, a normal TRAb test, is not predictive of prolonged remission.

# TSI assay

- Second-order testing for autoimmune thyroid disease, including:
  - 1.-Differential diagnosis of etiology of thyrotoxicosis in patients with ambiguous clinical signs or contraindicated (eg, pregnant or breast-feeding) or indeterminate thyroid radioisotope scans
  - 2.-Diagnosis of clinically suspected Graves disease (eg, extrathyroidal manifestations of Grave's disease: endocrine exophthalmos, pretibial myxedema, thyroid acropachy) but normal thyroid function tests
  - 3.-Determining the risk of neonatal thyrotoxicosis in a fetus of a pregnant female with active or past Graves disease
  - 4.-Differential diagnosis of gestational thyrotoxicosis versus first-trimester manifestation or recurrence of Grave's disease
  - 5.-Assessing the risk of Grave's disease relapse after antithyroid drug treatment
- A combination of TSI and Thyrotropin Receptor Antibody, is useful as an adjunct in the diagnosis of unusual cases of hypothyroidism (eg, Hashitoxicosis)
- TSIs are IgG antibodies and can, therefore, cross the placental barrier, causing neonatal thyrotoxicosis.

# TSI assay facts

- **Patient Preparation:**
- Sample: Serum/plasma (50-200  $\mu$ L)
- Preferred Storage:
  - Frozen (60 days) \*
  - Refrigerated (7 days)
  - Ambient (24 hours)
- Preferred Procedure in USA: Recombinant Bioassay
  - Mayoclinic Lab
- Reject Due To
  - Hemolysis: Mild OK; Gross reject
  - Lipemia: Mild OK; Gross OK
  - Icterus: Mild OK; Gross OK
- $RI = < \text{or} = 1.3$  TSI index



# Thyroid Lab Tests

Thyroid-related Laboratory tests can be divided into five (5) major categories:

- (1) Tests assessing Hypothalamus-Pituitary-Thyroid (HPT) axis
- (2) Tests estimating serum concentrations of **T4 & T3**
- (3) Tests reflecting the **impact** of thyroid hormone on **tissues**;
- (4) Tests presenting autoimmune thyroid disease;
- (5) **Tests providing information about thyroidal iodine metabolism.**





# 24-Urine Idoine





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Products	IDEAL INFORMED		SAMAN TASHEH NOUR	
	Intestine Panel	Tumor Marker	Vitamin D Allergy	MR Myeloma Abnormality (IgG, IgA)
Intestine Panel	CD45	CEA	CD45	CD45
	CD138	CA19-9	CD138	CD138
	CD20	CA125	CD20	CD20
	CD22	CA15-3	CD22	CD22
Tumor Marker	CD45	CEA	CD45	CD45
	CD138	CA19-9	CD138	CD138
	CD20	CA125	CD20	CD20
	CD22	CA15-3	CD22	CD22
Stomach Panel	CD45	CEA	CD45	CD45
	CD138	CA19-9	CD138	CD138
	CD20	CA125	CD20	CD20
	CD22	CA15-3	CD22	CD22
Rheumatology	CD45	CEA	CD45	CD45
	CD138	CA19-9	CD138	CD138
	CD20	CA125	CD20	CD20
	CD22	CA15-3	CD22	CD22
Allergy	CD45	CEA	CD45	CD45
	CD138	CA19-9	CD138	CD138
	CD20	CA125	CD20	CD20
	CD22	CA15-3	CD22	CD22
Vitamin D	CD45	CEA	CD45	CD45
	CD138	CA19-9	CD138	CD138
	CD20	CA125	CD20	CD20
	CD22	CA15-3	CD22	CD22
Coagulation	CD45	CEA	CD45	CD45
	CD138	CA19-9	CD138	CD138
	CD20	CA125	CD20	CD20
	CD22	CA15-3	CD22	CD22

**JAL TAJHIZ MEHRAN**  
LAB EQUIPMENT DESIGN & PRODUCTION



## 24-Urine Idoine

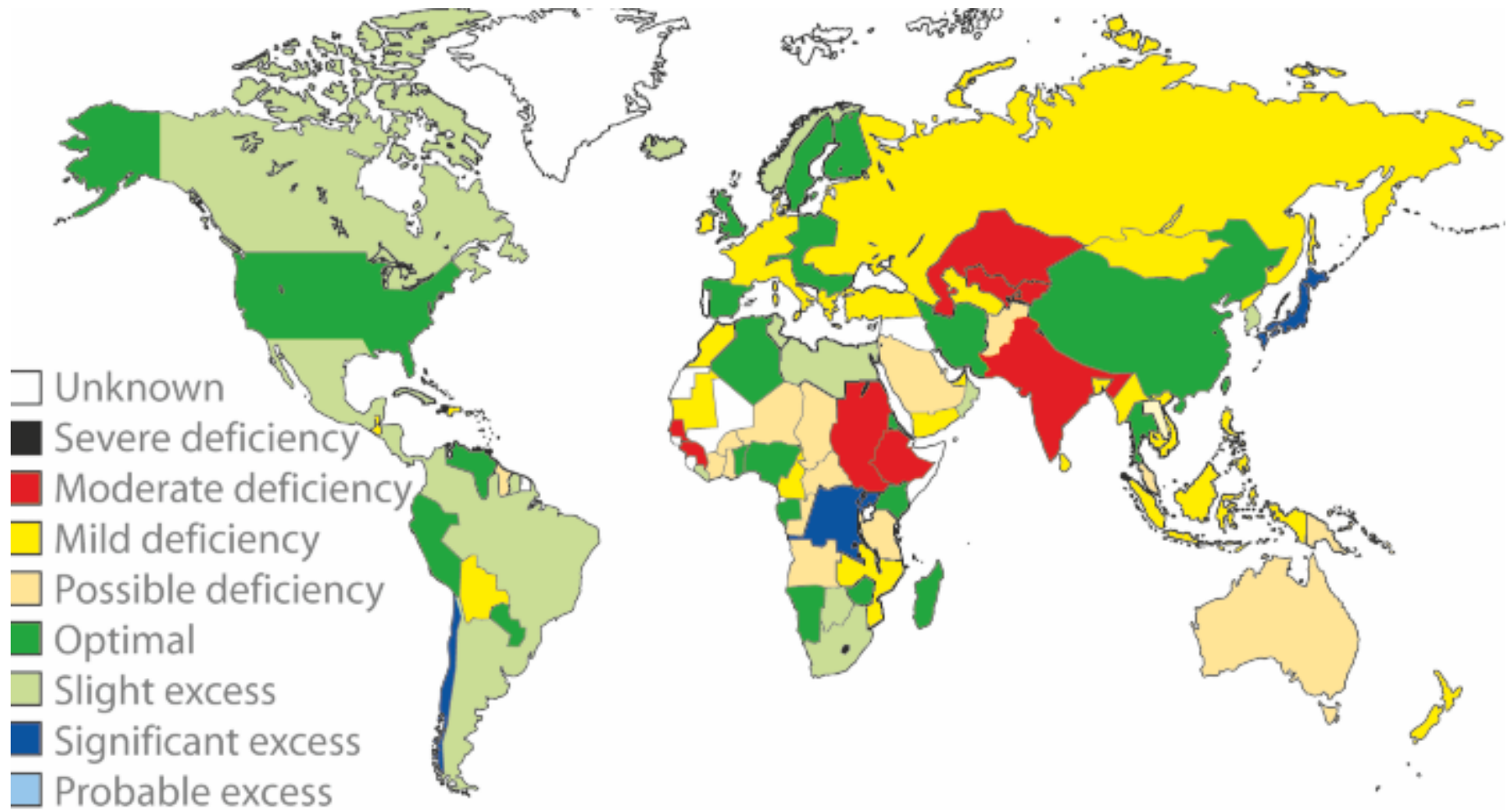
**Table 1. Epidemiological criteria for assessing iodine nutrition based on median urinary iodine concentrations in school-age children**

<b>Median urinary iodine (µg/l)</b>	<b>Iodine intake</b>	<b>Iodine nutrition</b>
< 20	Insufficient	Severe iodine deficiency
20–49	Insufficient	Moderate iodine deficiency
50–99	Insufficient	Mild iodine deficiency
100–199	Adequate	Optimal
200–299	More than adequate	Risk of iodine-induced hyperthyroidism in susceptible groups
>300	Excessive	Risk of adverse health consequences (IHD, autoimmune thyroid diseases)

Adapted from: WHO/UNICEF/ICCIDD (2).

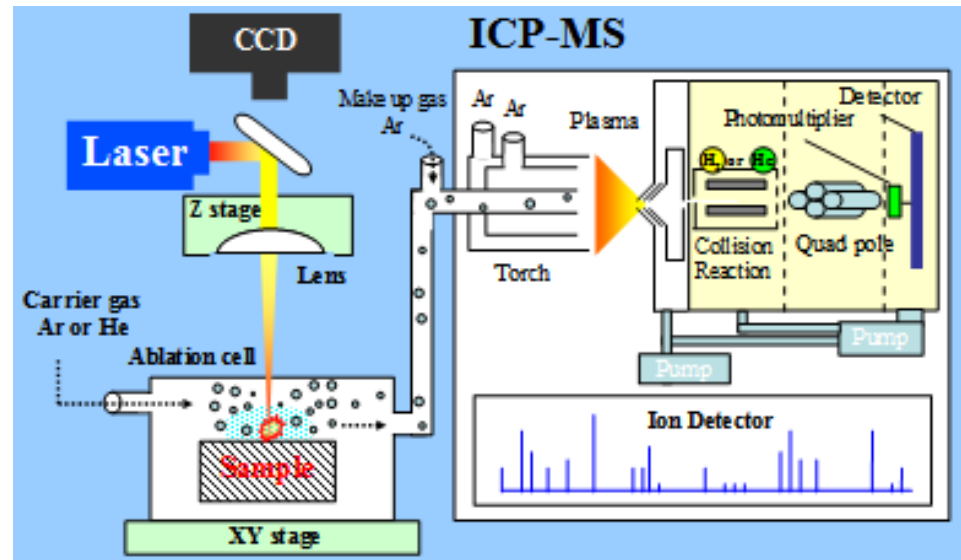
# Global Iodine Availability

(Natural availability and  $I_2$  consumed as food additives)



## 24-h Urine Idoine

- **Patient Preparation:**
- Sample: 24-h Urine (0.3 mL)
- Preferred Storage:
  - Refrigerated (146 days) \*
  - Ambient (146 hours)
  - Frozen (146 days)
- Preservative: 50% Acetic Acid

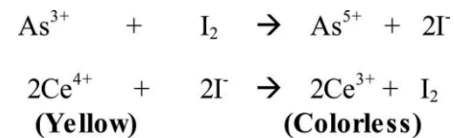


- Preferred Procedure (WHO)
- Ammonium Persulfate Method: (Sandell-Kolthoff reaction)
 

$$\text{As}^{3+} + \text{I}_2 \rightarrow$$

$$2\text{Ce}^{4+} + 2\text{I}^- \rightarrow$$

**(Yellow)**                      **(Colorless)**
- Preferred Procedure in USA:
  - Mayoclinic Lab: Inductively Coupled Plasma-Mass Spectrometry (ICP-MS)
- RI= 93-1,125 mcg/specimen



# Assay Standardization ?



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# Assay Standardization

## Measurement units: the SI

- SI base units

1. Metre
2. Kilogram
3. Second
4. Ampere
5. Kelvin
6. Mole
7. Candela

- Derived Units

Derived quantity		SI coherent derived unit	
Name	Symbol	Name	Symbol
area	$A$	square metre	$m^2$
volume	$V$	cubic metre	$m^3$
speed, velocity	$v$	metre per second	$m/s$
acceleration	$a$	metre per second squared	$m/s^2$
wavenumber	$\sigma, \tilde{\nu}$	reciprocal metre	$m^{-1}$
density, mass density	$\rho$	kilogram per cubic metre	$kg/m^3$
surface density	$\rho_A$	kilogram per square metre	$kg/m^2$
specific volume	$v$	cubic metre per kilogram	$m^3/kg$
current density	$j$	ampere per square metre	$A/m^2$
magnetic field strength	$H$	ampere per metre	$A/m$
amount concentration <sup>(a)</sup> , concentration	$c$	mole per cubic metre	$mol/m^3$
mass concentration	$\rho, \gamma$	kilogram per cubic metre	$kg/m^3$
luminance	$L_v$	candela per square metre	$cd/m^2$
refractive index <sup>(b)</sup>	$n$	one	1
relative permeability <sup>(b)</sup>	$\mu_r$	one	1

(a) In the field of clinical chemistry this quantity is also called substance concentration.

(b) These are dimensionless quantities, or quantities of dimension one, and the symbol "1" for the unit (the number "one") is generally omitted in specifying the values of dimensionless quantities.



# Assay Standardization

**Goal:** Measurement results be comparable between laboratories and methods, over time, with common reference ranges.

**Definition:** Calibration traceable to International System of Units using a Reference Measurement Procedure (RMP)  
(to cause to conform with a standard)

## Requirements:

### 1. Full Metrological Traceability

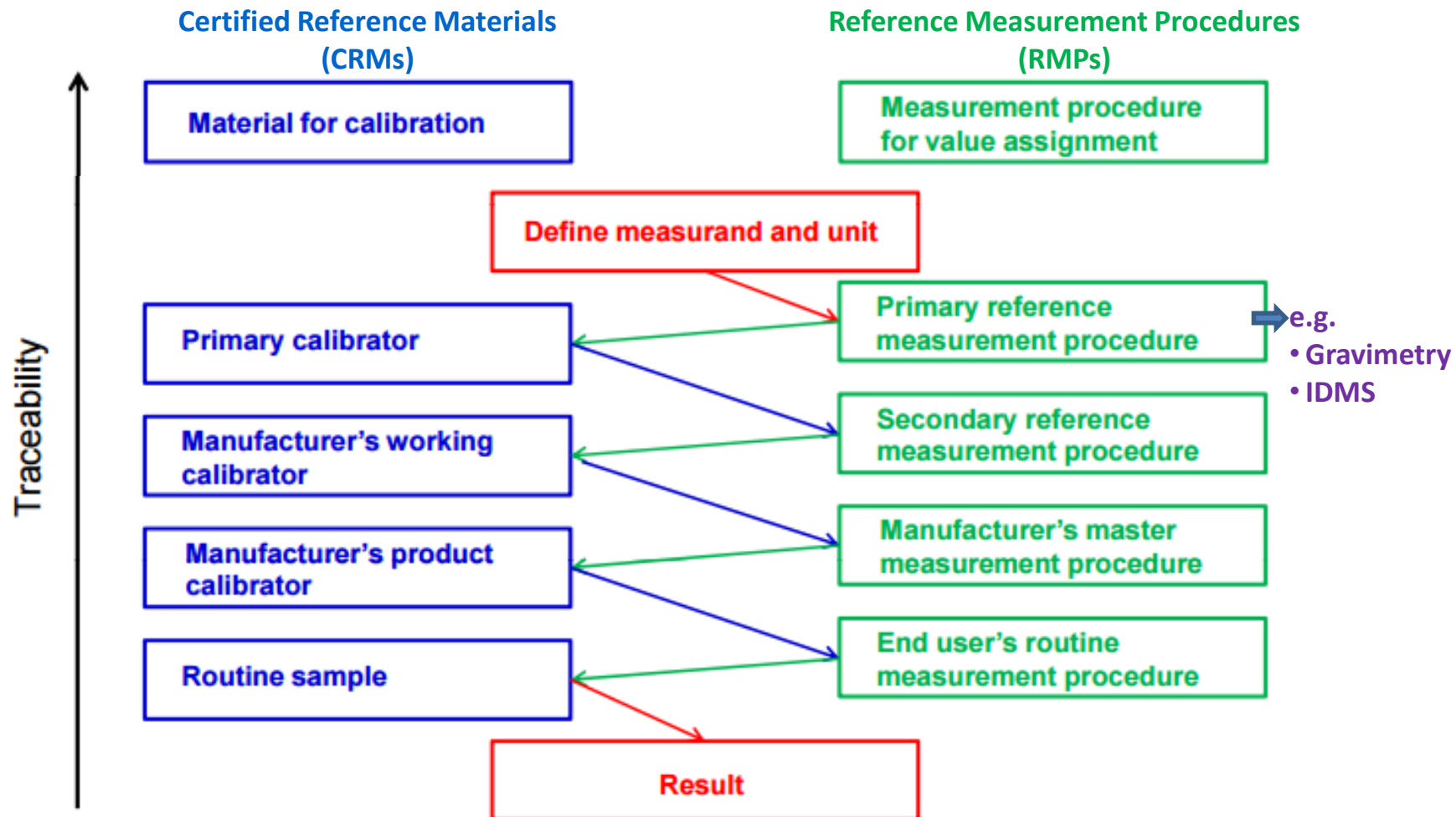
- ✓ Traceability Concept
- ✓ Reference Measurement Procedure (RMP)
- ✓ Certified Standard Reference Material (CRM)

### 2. Commutability

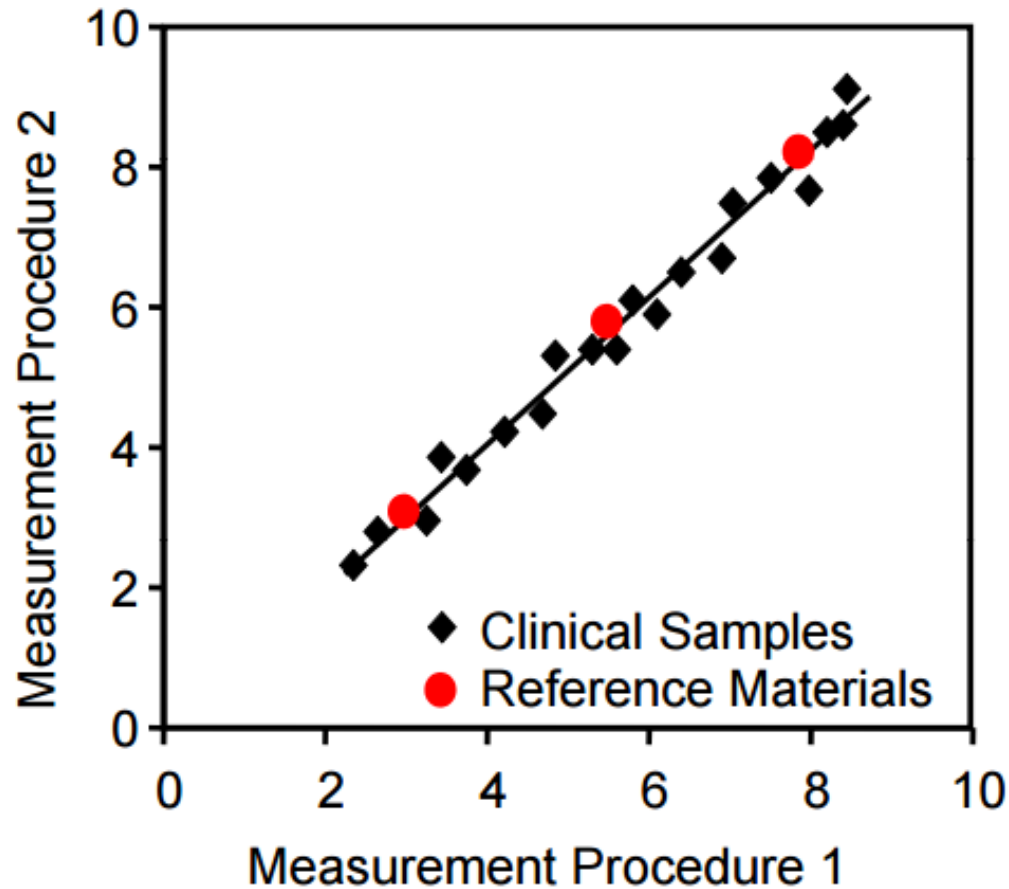
### 3. Broad Range Coverage

# Assay Standardization

## (Full Metrological Traceability)



# Assay Standardization (Commutability)



Miller 2012

# Thank You for your Attention



[dr.bakhtiari.academy](https://www.instagram.com/dr.bakhtiari.academy)

ردیف	تاریخ	نحوه برگزاری	مبحث	نام استاد	امتیاز بازآموزی
۱	۱۴۰۱/۱۰/۰۲	آنلاین - حضوری	سل کانترهای پیشرفته	دکتر نادر وظیفه شیران	✓
۲	۱۴۰۱/۱۰/۰۶	آنلاین - حضوری	مدیریت ریسک و مدیریت هزینه	دکتر مهرداد ونکی	✓
۳	۱۴۰۱/۱۰/۱۵	آنلاین - حضوری	تیروئید شناسی	دکتر محمدرضا بختیاری	✓
۴	۱۴۰۱/۱۰/۱۶	آنلاین - حضوری	تیروئید شناسی	دکتر محمدرضا بختیاری	✓
۵	۱۴۰۱/۱۰/۲۲	آنلاین - حضوری	تیروئید شناسی	دکتر محمدرضا بختیاری	✓
۶	۱۴۰۱/۱۰/۲۳	آنلاین - حضوری	تیروئید شناسی	دکتر محمدرضا بختیاری	✓
۷	۱۴۰۱/۱۰/۲۹	آنلاین	کنترل کیفیت در آزمایش تعیین حساسیت ضد میکروبی (آنتی بیوگرام)	دکتر سید مهدی بوتراپی	✓
۸	۱۴۰۱/۱۱/۰۶	آنلاین	ایمونوپاتولوژی انواع هپاتیت های ویروسی و اتوایمون	دکتر بابک بلبلی	✓
۹	۱۴۰۱/۱۱/۰۷	آنلاین	اصول تفسیر و چالشهای آزمایشگاهی انواع هپاتیت ویروسی	دکتر بابک بلبلی	✓
۱۰	۱۴۰۱/۱۱/۰۸	آنلاین	کنترلی کیفیت ابزار پایه در بخش میکروب شناسی	سرکار خانم صبوریان	✓
۱۱	۱۴۰۱/۱۱/۰۹	آنلاین	کنترل کیفیت در بخش میکروب شناسی	سرکار خانم صبوریان	✓
۱۲	۱۴۰۱/۱۱/۱۱	آنلاین - حضوری	اصول مشتری مداری	مهندس بابکی	✗
۱۳	۱۴۰۱/۱۱/۱۲	آنلاین - حضوری	اصول مشتری مداری	مهندس بابکی	✗
۱۴	۱۴۰۱/۱۲/۰۴	آنلاین	جنبه های آزمایشگاهی هورمون رشد و پرولاکتین	دکتر رضا محمدی	✓
۱۵	۱۴۰۱/۱۲/۰۵	آنلاین	جنبه های آزمایشگاهی غدد فوق کلیوی	دکتر رضا محمدی	✓
۱۶	۱۴۰۱/۱۲/۱۱	آنلاین	جنبه های آزمایشگاهی غدد تیروئید	دکتر رضا محمدی	✓
۱۷	۱۴۰۱/۱۲/۱۲	آنلاین	جنبه های آزمایشگاهی غدد جنسی	دکتر رضا محمدی	✓



# Hipro®

Hipro Biotechnology Co., Ltd

## HP083/4-II

- 4 individual test channels
- Rapid whole blood test
- Simple, Rapid, Accurate
- Portable near to patient

## Hurricane

POCT Immunoassay System



# Magnus

microscopes

## MX21i

CLINICAL MICROSCOPE



- Anti fungus optics
- Plan superior imaging
- Rackless stage for durability and ease of use
- Ergonomic and compact design for user convenience
- Aspheric light relay system for bright and uniform illumination

### Optional Accessories



Dual Filter (B&O)



Trinocular Head With USB Digital Camera

شرکت بنیان درمان

# Lifotronic

## GeneStar-96 Real-Time PCR System

- Compact & High throughput
- High efficiency
- Reliable
- High flexibility



شرکت بنیان درمان  
تلفن: ۸۸۷۰۳۰۵۰ (خط ۱۰)



# Lifotronic

## eCL8000

Electro-chemiluminescence Immunoassay (ECLIA) System

### Advantages of Electro-chemiluminescence Immunoassay

- Controllable Optical Signal
- High Sensitivity and Precision
- Magnitude of Luminescent Intensity Reaches Six Orders
- Compatible with Small Sample Volume
- High Stability for Reagent
- One of The ECLIA System in the World



شرکت بنیان درمان  
تلفن: ۸۸۷۰۳۰۵۰ (خط ۱۰)





## ژال تجهیز

**JAL TAJHIZ MEHRAN**  
LAB EQUIPMENT DESIGN & PRODUCTION



**JAL TAJHIZ MEHRAN**  
[WWW.JALTAJHIZCO.COM](http://WWW.JALTAJHIZCO.COM)  
(دانش بنیان)

**(طراحی - مشاوره - اجرا و ساخت تجهیزات آزمایشگاهی و تحقیقاتی)**  
با مجوز از وزارت بهداشت درمان و آموزش پزشکی و وزارت صنایع و معادن استان تهران



Products	Thyroid Panel	T3 (96)	Tumor Markers	*PSA (96)
		T3 (192)		*Free PSA (96)
		T4 (96)		*CEA (96)
		T4 (192)		*AFP (96)
		*TSH (96)		*CA 125 (96)
		*TSH (192)		*CA 19-9 (96)
		Free T3 (96)		*CA 15-3 (96)
		Free T4 (96)		*DHEA-S (96)
		T-uptake (96)		*17OH-Progesterone (96)
		*Anti-TPO		*E2 Estradiol (96)
Infectious Diseases	Steroids Panel	*Anti-H. pylori-IgA (96)	Vitamin D	*Testosterone (96)
		*Anti-H. pylori-IgM (96)		*Progesterone (96)
		*Anti-H. pylori-IgG (96)		*Cortisol (96)
Rheumatology	Allergy	ANA (96)		*Free Testosterone
		Anti-ds DNA (96)	SARS-COV-2	25-Hydroxy Vitamin D (96)
		CCP (96)		25-Hydroxy Vitamin D (192)
Anemia	SARS-COV-2	*Ferritin (96)		*IgE (96)
		*Ferritin (192)	SARS-COV-2	SARS-COV-2-IgG
		*Vitamin B12 (96)		SARS-COV-2-IgM Captures (96)
		*Folate (96)		SARS-COV-2-Antigen Rapid

\* رنگدانه‌های پلانت استریمو ویدین - بیوتین

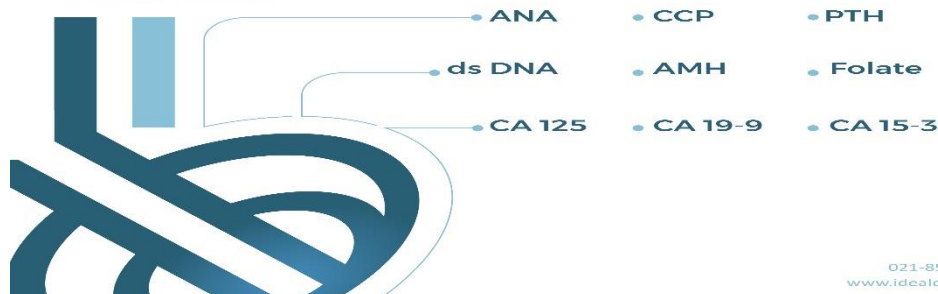
Products	Growth Hormone	*IGH (96)
		*ParaThyroid Hormone
	Fertility Panel	*LH (96)
		*FSH (96)
		*PRL (96)
		*hCG Thr (96)
		*hCG (96) Rapid
		*hCG (192) Rapid
		AMH (96)

### NEW Kits

Products	Rheumatology	ANA (96)
		Anti-ds DNA (96)
	Tumor Markers	CCP (96)
		*CA 125
		*CA 19-9
		*CA 15-3
	Fertility	AMH
		Folate
	Miscellaneous	PTH

\* رنگدانه‌های پلانت استریمو ویدین - بیوتین

### NEW Kits



021-85519519  
www.idealdiag.com

- ANA
- dsDNA
- CCP
- AMH
- PTH
- CA 125
- CA 19-9
- CA 15-3
- Folate

www.idealdiag.com

021-85519519

idealdiag.com

عضو شبکه تشخیص ایده آل

- ANA
- dsDNA
- CCP
- AMH
- Folate
- PTH

- CA 125
- CA 19-9
- CA 15-3

### NEW KITS

تولید کننده

کیت‌های تشخیص طی الایزا

- Tumor Markers
- Thyroid
- Growth Hormone

- Fertility

- Anemia



- Steroids

- Allergy

- Rheumatology
- Vitamin D
- Infectious Diseases

- ANA
- dsDNA
- CCP
- CA 125
- CA 19-9
- AMH
- Folate
- PTH
- CA 15-3

### NEW KITS

idealdiag.com

Products	Thyroid Panel	T3 (96/192)	Tumor Markers	*CA15-3	Vitamin D	25-Hydroxy Vitamin D (96/192)
		T3 (96/192)		*CA19-9		*IgE (96)
		*TSH (96/192)		*CA-125		*LH
		Free T3		*CEA		*TSH
		Free T4		*AFP		*AMH
		T-uptake		*Free PSA		*hCG Thr
		PTI		*Progesterone		*hCG Rapid
		*Anti-Tg		*E2 Estradiol		Cardiolipin-IgG 5-IgM
		*Anti-TPO		*Testosterone		BE-Digen-IgG 5-IgM
		*Anti-TPO		*Free Testosterone	Thrombosis	BE-Digen-IgG 5-IgM
Infectious Diseases	Steroids Panel	HIV		*17OH-Progesterone		Phosphatidyl-Serine-GM
		PCV		*Control		Pro-C
		HBsAg		*DHEA-S	Gastroenterology	Pro-S
		*Anti-H. pylori-IgA		ANA-RF		CA19-9
		*Anti-H. pylori-IgA		ANA-A		CA15-3
		*Anti-H. pylori-IgM		SS-A	Miscellaneous	CA125
		*Ferritin	Rheumatology	ANA-Inhib		IFN-γ
		*Ferritin		ANA-Quantitative		*IgM
		*Vitamin B12		dsDNA-Check	Coagulation	*Fibrin
		*Vitamin B12		dsDNA-Check		Interferon-γ
		*Vitamin B12		dsDNA-IgG		*Flagman 1
Vasculitis	Coagulation	BT (normal)		dsDNA-IgG		
		BT (normal)		dsDNA-IgG		
		BT (normal)		dsDNA-IgG		
		BT (normal)		dsDNA-IgG		

عضو شبکه تشخیص ایده آل

samantajhiz.com

- Tumor Markers
- Thyroid
- Gastroenterology

- Fertility

- Anemia



- Steroids

- Allergy

- Coagulation
- Vitamin D
- Thrombosis

- Rheumatology
- Vasculitis
- Infectious Diseases

### Samantajhiz

samantajhiz.com

# دیپارتمان آموزش و پژوهش

## انجمن علمی دکترای علوم آزمایشگاهی

Education and Research  
Department of DCLS  
Association of Iran

## تشخیص طبی ایران



انجمن علمی دکترای علوم آزمایشگاهی  
تشخیص طبی ایران



• Tumor Markers

• Thyroid

• Growth Hormone

• Fertility



• Steroids

• Anemia

• Allergy

• Rheumatology

• Vitamin D

• Infectious Diseases

NEW KITS

ANA

ds DNA

CCP

CA 125

CA19-9

AMH

Folate

PTH

CA15-3

idealdiag.com



هدف ما، ارتقاء فناوری صنعت آزمایشگاهی کشور



Intelligence of the country's lab industry

# Hipro®

Hipro Biotechnology Co., Ltd

- 4 individual test channels
- Rapid whole blood test
- Simple, Rapid, Accurate
- 3-level Calibration System
- Assure reliable and accurate results
- Multi-methodologies



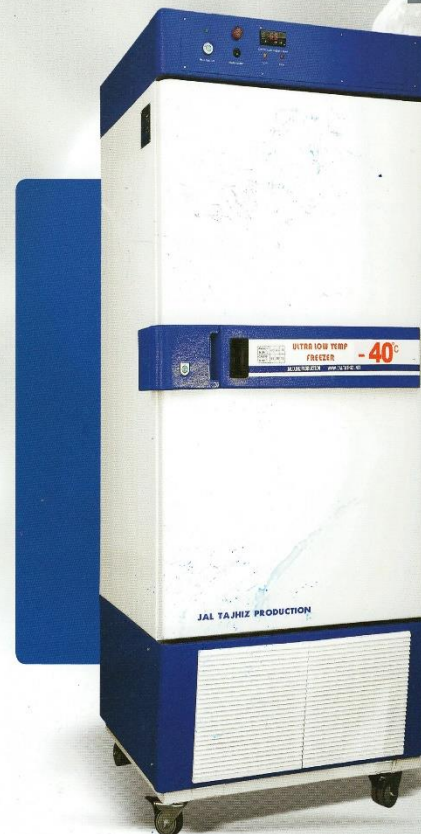
## Hurricane

POCT Immunoassay System

شرکت بنیان دروهان  
تلفن: ۰۲۰-۸۸۷۰۳۰۵۰ (خط ۱۰)

## Jal Tajhiz co., Ltd

LAB EQUIPMENT DESIGN & PRODUCTION



FREEZER - 40°C  
UPRIGHT



MODEL	JTFUL130	JTFUL280	JTFUL360
Capacity	130 L	280 L	360 L
External dimensions	150*55*70 cm	177*72*80 cm	200*72*80 cm
Internal dimensions	75*35*55 cm	96*52*55 cm	125*52*55 cm
Shelves	3	4	5





هدف ما، ارتقاء فناوری صنعت آزمایشگاهی کشور



لطفا  
اسکن  
کنید

Our vision  
Intelligence of the country's lab industry



تهران، بلوار آیت الله کاشانی، خیابان گلستان

شمالی، کوچه نسترن شرقی، پلاک ۶۱

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۰۲۱.۴۹۳۷۵۰۰۰ (خط ویژه)