ARCHITECT T-Uptake

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REF 2K48-25

en
T-Uptake
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Package insert instructions must be carefully followed. Reliability of assay results cannot be guaranteed if there are any deviations from the instructions in this package insert.

NAME

ARCHITECT T-Uptake

INTENDED USE

The ARCHITECT T-Uptake assay is a chemiluminescent microparticle immunoassay (CMIA) for the quantitative determination of the total binding capacity of human serum or plasma for the thyroid hormone, Thyroxine (T_4).

The ARCHITECT T-Uptake assay should be used in conjunction with Total T_4 to yield a calculated Free Thyroxine Index (FTI), as an aid in the assessment of thyroid function status.

SUMMARY AND EXPLANATION OF THE TEST

The classical *in vitro* thyroid hormone "Uptake" assays measure the unsaturated thyroxine binding sites of serum proteins. The ARCHITECT T-Uptake assay measures the total binding capacity present in a sample. The thyroid hormones, thyroxine (T_4) and triiodothyronine (T_3), are transported in serum bound to the thyroxine binding proteins, thyroxine binding globulin (TBG), thyroxine binding prealbumin (TBPA), and albumin. TBG, TBPA, and albumin bind approximately 75%, 15% and 10% of the total circulating T_4, respectively, and bind 38%, 27% and 35% of T_3, respectively.[1] In a euthyroid patient, T_4 occupies approximately one third of the binding sites.[2] Free, or unbound fractions of the thyroid hormones are thought to be responsible for biologic activity.[3, 4] The FTI has been the most widely used method to estimate free T_4. Uptake assays are of greatest value when used in conjunction with a serum Total T_4 assay to provide the FTI.[5]

The Uptake assays are used to normalize the Total T_4 levels for variations in serum thyroxine binding protein (TBP) concentrations. Performing an Uptake assay and subsequent calculation of the FTI is important since certain conditions such as pregnancy, estrogen therapy, infectious and chronic active hepatitis, biliary cirrhosis or congenital disorders alter the number of T_4 binding sites.[6-8] These variations can produce abnormal T_4 values in an individual with no thyroid disease. Since the T_4 values or the T-Uptake values alone can produce misleading information, an FTI can be calculated to provide a clinically useful and accurate estimate of circulating free thyroxine.[9-11] To ensure maximum diagnostic accuracy of thyroid status, an FTI should be used in conjunction with clinical evaluation and other thyroid function tests such as human thyroid stimulating hormone (TSH).

Since the ARCHITECT T-Uptake assay is a direct measure of the total binding capacity in human serum or plasma, a linear relationship between signal and TBG activity is observed. This provides for both low and high end accuracy. By contrast, traditional $\%T_3$ Uptake assays are non-linear relative to TBP concentration. ARCHITECT T-Uptake and $\%T_3$ Uptake both respond to variations in TBG concentration. The $\%T_3$ Uptake also responds to variations in T_4 levels. Since T-Uptake and $\%T_3$ Uptake do not measure the same exact phenomenon, a direct conversion of units to % transformed is not possible and thus the % transformed value should be viewed as an approximation only.

BIOLOGICAL PRINCIPLES OF THE PROCEDURE

The ARCHITECT T-Uptake assay is a one-step immunoassay to measure the total binding capacity of human serum or plasma for T_4 using CMIA technology with flexible assay protocols, referred to as Chemiflex.

1. Sample, assay diluent, anti-TBG coated paramagnetic microparticles and free anti-TBG are combined. The TBG present in the sample binds to the anti-TBG coated microparticles and the free anti-TBG. After an incubation period, T_4-acridinium conjugate is added to the reaction mixture and it binds to TBG, free or microparticle bound.
2. After washing to remove free conjugate and conjugate bound to TBG-free anti-TBG complex, Pre-Trigger and Trigger solutions are added to the reaction mixture.
3. The resulting chemiluminescent reaction is measured as relative light units (RLUs). There is a direct relationship between the amount of TBG in the sample and the RLUs detected by the ARCHITECT iSystem optics.
4. A calibration curve is established using TBG calibrators of known T-Uptake Units plotted against their corresponding RLU signals.

For additional information on system and assay technology, refer to the ARCHITECT System Operations Manual, Section 3.

REAGENTS

Kit Contents

ARCHITECT T-Uptake 2K48

NOTE: Some kit sizes are not available in all countries or for use on all ARCHITECT iSystems. Please contact your local distributor.

REF	2K48-25	2K48-20
Σ	100	400
MICROPARTICLES	1 x 6.6 mL	4 x 6.6 mL
CONJUGATE	1 x 2.9 mL	4 x 2.9 mL
ASSAY DILUENT	1 x 1.8 mL	4 x 1.8 mL

MICROPARTICLES Anti-Thyroxine Binding Globulin (TBG) (mouse, monoclonal) coated microparticles and free Anti-TBG in phosphate buffer with protein (bovine and fish) stabilizers. Minimum percent solid: 0.115%. Preservative: sodium azide.

CONJUGATE T_4-acridinium conjugate in citrate buffer. Minimum concentration: 0.03 µg/mL. Preservative: ProClin 300.

ASSAY DILUENT T-Uptake Assay Diluent in TRIS buffer. Preservative: sodium azide.

Other Reagents

PRE-TRIGGER SOLUTION ARCHITECT Pre-Trigger Solution containing 1.32% (w/v) hydrogen peroxide.

TRIGGER SOLUTION ARCHITECT Trigger Solution containing 0.35 N sodium hydroxide.

WASH BUFFER ARCHITECT Wash Buffer containing phosphate buffered saline solution. Preservatives: antimicrobial agents.

Warnings and Precautions

- IVD
- For *In Vitro* Diagnostic Use

Safety Precautions

CAUTION: This product requires the handling of human specimens. It is recommended that all human-sourced materials be considered potentially infectious and handled in accordance with the OSHA Standard on Bloodborne Pathogens. Biosafety Level 2 or other appropriate biosafety practices should be used for materials that contain or are suspected of containing infectious agents.[12-15]

The following warnings and precautions apply to: CONJUGATE	
	
DANGER	Contains N,N-dimethylformamide and methylisothiazolones.
H360	May damage fertility or the unborn child.
H317	May cause an allergic skin reaction.
Prevention	
P201	Obtain special instructions before use.
P261	Avoid breathing mist / vapors / spray.
P272	Contaminated work clothing should not be allowed out of the workplace.
P280	Wear protective gloves / protective clothing / eye protection.
Response	
P308+P313	IF exposed or concerned: Get medical advice / attention.
P302+P352	IF ON SKIN: Wash with plenty of water.
P333+P313	If skin irritation or rash occurs: Get medical advice / attention.
P362+P364	Take off contaminated clothing and wash it before reuse.
Disposal	
P501	Dispose of contents / container in accordance with local regulations.

The following warnings and precautions apply to: MICROPARTICLES and ASSAY DILUENT	
Contains sodium azide.	
EUH032	Contact with acids liberates very toxic gas.
P501	Dispose of contents / container in accordance with local regulations.

Safety Data Sheets are available at www.abbottdiagnostics.com or contact your local representative.

For a detailed discussion of safety precautions during system operation, refer to the ARCHITECT System Operations Manual, Section 8.

Reagent Handling

- Do not use reagent kits beyond the expiration date.
- **Do not pool reagents within a kit or between kits.**
- Before loading the reagent kit on the system for the first time, the microparticle bottle requires mixing to resuspend microparticles that may have settled during shipment. For microparticle mixing instructions, refer to the **PROCEDURE, Assay Procedure** section of this package insert.
- **Septums MUST be used to prevent reagent evaporation and contamination and to ensure reagent integrity. Reliability of assay results cannot be guaranteed if septums are not used according to the instructions in this package insert.**
  - To avoid contamination, wear clean gloves when placing a septum on an uncapped reagent bottle.
  - Once a septum has been placed on an open reagent bottle, **do not invert the bottle** as this will result in reagent leakage and may compromise assay results.
  - Over time, residual liquids may dry on the septum surface. These are typically dried salts and have no effect on assay efficacy.

For a detailed discussion of handling precautions during system operation, refer to the ARCHITECT System Operations Manual, Section 7.

Reagent Storage

When stored and handled as directed, reagents are stable until the expiration date.

	Storage Temperature	Maximum Storage Time	Additional Storage Instructions
Unopened/ Opened*	2-8°C	Until expiration date	May be used immediately after removal from 2-8°C storage. Store in upright position.
On board	System temperature	28 days	Discard after 28 days. For information on tracking onboard time, refer to the ARCHITECT System Operations Manual, Section 5.

* Reagents may be stored on or off the ARCHITECT iSystem. If reagents are removed from the system, store them at 2-8°C (with septums and replacement caps) in an upright position. For reagents stored off the system, it is recommended that they be stored in their original trays and boxes to ensure they remain upright. **If the microparticle bottle does not remain upright (with a septum installed) while in refrigerated storage off the system, the reagent kit must be discarded.** For information on unloading reagents, refer to the ARCHITECT System Operations Manual, Section 5.

Indications of Reagent Deterioration

When a control value is out of the specified range, it may indicate deterioration of the reagents or errors in technique. Associated test results are invalid, and samples must be retested. Assay recalibration may be necessary. For troubleshooting information, refer to the ARCHITECT System Operations Manual, Section 10.

INSTRUMENT PROCEDURE

The ARCHITECT T-Uptake assay file must be installed on the ARCHITECT iSystem prior to performing the assay.

For detailed information on assay file installation and viewing and editing assay parameters, refer to the ARCHITECT System Operations Manual, Section 2.

For information on printing assay parameters, refer to the ARCHITECT System Operations Manual, Section 5.

For a detailed description of system procedures, refer to the ARCHITECT System Operations Manual.

Alternate Result Units

The default result unit for the ARCHITECT T-Uptake assay is T-Uptake Units. An alternate result unit, %Uptake, may be selected for reporting results. For transformation of result units, refer to the **RESULTS, Transformation of T-Uptake Units to %Uptake** section of this package insert.

SPECIMEN COLLECTION AND PREPARATION FOR ANALYSIS

Specimen Types

Verified specimen types to be used with this assay:

	Collection Tubes	
Specimen Types	**Glass**	**Plastic**
Serum	No Additives Serum separator tubes with clot activators	Clot activator
Plasma	Lithium Heparin Plasma Separator Tube - Lithium Heparin Sodium Heparin EDTA	EDTA

- Other specimen collection tube types have not been tested with this assay.

  Follow the manufacturer's processing instructions for serum or plasma collection tubes.
- Performance has not been established for the use of body fluids other than human serum or plasma.
- Inadequate centrifugation of the specimen may cause an erroneous result.
- When serial specimens are being evaluated, use the same specimen type throughout the evaluation.
- The instrument does not provide the capability to verify specimen type. It is the responsibility of the operator to verify that the correct specimen types are used in the assay.

Specimen Conditions

- Do not use specimens with the following conditions:
  - heat-inactivated
  - obvious microbial contamination
- Ensure specimens are free of fibrin, red blood cells, and other particulate matter.
- For serum specimens, ensure that complete clot formation has taken place prior to centrifugation. Some specimens, especially those from patients receiving anticoagulant or thrombolytic therapy, may exhibit increased clotting times. If the specimen is centrifuged before complete clot formation, the presence of fibrin may cause erroneous results.
- To prevent cross contamination, use of disposable pipettes or pipette tips is recommended.
- If a lipid layer forms on the specimen surface, avoid the lipid layer when withdrawing the specimen.

Preparation for Analysis

- Follow the tube manufacturer's processing instructions for specimen collection tubes.
- Multiple freeze-thaw cycles of specimens should be avoided.
- Specimens must be mixed **THOROUGHLY** after thawing, by LOW speed vortexing or by gently inverting, and centrifuged prior to use to remove red blood cells or particulate matter to ensure consistency in the results.
- Transfer clarified specimen to a sample cup or secondary tube for testing. For centrifuged specimens with a lipid layer, transfer only the clarified specimen and not the lipemic material.
- Inspect all specimens for bubbles. Remove bubbles with an applicator stick before analysis. Use a new applicator stick for each specimen to prevent cross contamination.

Specimen Storage

Specimen Type	Storage Temperature	Maximum Storage Time
Serum/Plasma	Room temperature	≤ 24 hours
	2-8°C	≤ 14 days
	-10°C or colder	≤ 30 days

Remove serum or plasma from the clot, red blood cells, or separator gel if stored longer than the maximum room temperature storage time.

Specimens removed from the cells, clot, or gel may be stored up to 14 days at 2-8°C.

If testing will be delayed more than 14 days, specimens should be stored frozen (-10°C or colder) prior to being tested.

Specimens stored frozen for 30 days showed no performance differences from fresh samples.

Avoid multiple freeze/thaw cycles.

Specimens must be mixed thoroughly after thawing to ensure consistency of the results.

Specimen Shipping

- Package and label specimens in compliance with applicable state, federal, and international regulations covering the transport of clinical specimens and infectious substances.
- Prior to shipping, remove the plasma or serum specimen from the cells, clot, or gel.
- Ship frozen (dry ice).
- Do not exceed the storage time limitations listed above.

PROCEDURE

Materials Provided

2K48 ARCHITECT T-Uptake Reagent Kit

Materials Required but not Provided

- ARCHITECT T-Uptake Assay file obtained from the ARCHITECT iSystem e-Assay CD-ROM found on www.abbottdiagnostics.com.
- 2K48-01 ARCHITECT T-Uptake Calibrators
- 2K48-10 ARCHITECT T-Uptake Controls
- ARCHITECT Pre-Trigger Solution
- ARCHITECT Trigger Solution
- ARCHITECT Wash Buffer
- ARCHITECT Reaction Vessels
- ARCHITECT Sample Cups
- ARCHITECT Septum
- ARCHITECT Replacement Caps
- Pipettes or pipette tips (optional) to deliver the volumes specified on the patient or control order screen.

For information on materials required for maintenance procedures, refer to the ARCHITECT System Operations Manual, Section 9.

Assay Procedure

- Before loading the reagent kit on the system for the first time, the microparticle bottle requires mixing to resuspend microparticles that may have settled during shipment. After the first time the microparticles have been loaded, no further mixing is required.
  - **Invert the microparticle bottle 30 times.**
  - Visually inspect the bottle to ensure microparticles are resuspended. If microparticles are still adhered to the bottle, continue to invert the bottle until the microparticles have been completely resuspended.
  - **If the microparticles do not resuspend, DO NOT USE. Contact your local Abbott representative.**
  - Once the microparticles have been resuspended, place a septum on the bottle. For instructions about placing septums on bottles, refer to the **Reagent Handling** section of this package insert.
- Load the reagent kit on the ARCHITECT iSystem.
  - Verify that all necessary reagents are present.

- Ensure that septums are present on all reagent bottles.

- Order calibration, if necessary.
  - For information on ordering calibrations, refer to the ARCHITECT System Operations Manual, Section 6.
- Order tests.
  - For information on ordering patient specimens and controls and for general operating procedures, refer to the ARCHITECT System Operations Manual, Section 5.
- Minimum sample cup volume is calculated by the system and printed on the Orderlist report. To minimize the effects of evaporation, verify adequate sample cup volume is present prior to running the test.

  Maximum number of replicates sampled from the same sample cup: 10
  - Priority:

    Sample volume for first test: 70 µL

    Sample volume for each additional test from same sample cup: 20 µL
  - ≤ 3 hours on board:

    Sample volume for first test: 150 µL

    Sample volume for each additional test from same sample cup: 20 µL
  - > 3 hours on board: Additional sample volume required. Refer to the ARCHITECT System Operations Manual, Section 5 for information on sample evaporation and volumes.
  - If using primary or aliquot tubes, use the sample gauge to ensure sufficient patient specimen is present.
- Prepare calibrators and controls.
  - ARCHITECT T-Uptake Calibrators and Controls should be mixed according to their respective package inserts.
  - Hold bottles **vertically** and dispense recommended volumes into each respective sample cup.
    - Recommended volumes:

      for each calibrator: 5 drops

      for each control: 5 drops
- Load samples.
  - For information on loading samples, refer to the ARCHITECT System Operations Manual, Section 5.
- Press RUN.
- For additional information on principles of operation, refer to the ARCHITECT System Operations Manual, Section 3.
- For optimal performance, it is important to perform routine maintenance as described in the ARCHITECT System Operations Manual, Section 9. Perform maintenance more frequently when required by laboratory procedures.

Specimen Dilution Procedures

Specimens cannot be diluted for the T-Uptake assay. Specimens with a T-Uptake concentration of > 1.89 T-Uptake Units will be flagged as "> 1.89" T-Uptake Units and should be reported as such.

Calibration

- Test Calibrators A-F in duplicate. The calibrators should be priority loaded.

  A single sample of each control level must be tested to evaluate the assay calibration. Ensure that assay control values are within the ranges specified in the respective control package insert.
- Calibration Range: 0.0 - 1.9 T-Uptake Units.
- Once an ARCHITECT T-Uptake calibration is accepted and stored, all subsequent samples may be tested without further calibration unless:
  - A reagent kit with a new lot number is used or
  - Controls are out of range.
- For detailed information on how to perform an assay calibration, refer to the ARCHITECT System Operations Manual, Section 6.

Quality Control Procedures

The recommended control requirement for the ARCHITECT T-Uptake assay is that a single sample of each control level be tested once every 24 hours each day of use. If the quality control procedures in your laboratory require more frequent use of controls to verify test results, follow your laboratory-specific procedures.

The ARCHITECT T-Uptake Control values must be within the acceptable ranges specified in the control package insert. If a control is out of its specified range, the associated sample results are invalid and the samples must be retested. Recalibration may be indicated.

Verification of Assay Claims

For protocols to verify package insert claims, refer to the ARCHITECT System Operations Manual, Appendix B.

The ARCHITECT T-Uptake assay belongs to method group 3.

RESULTS

Calculation

The ARCHITECT T-Uptake assay utilizes a 4 Parameter Logistic Curve fit data reduction method (4PLC, Y-weighted) to generate a calibration curve.

For information on alternate result units, refer to the **INSTRUMENT PROCEDURE, Alternate Result Units** section of this package insert.

Transformation of T-Uptake Units to %Uptake

The ARCHITECT iSystem is programmed to provide the T-Uptake values in T-Uptake Units (dimensionless unit). Values are referenced to a T-Uptake value of 1.0, with 1.0 representing a normal binding capacity. T-Uptake Units are the suggested way to report the ARCHITECT T-Uptake values. This suggestion is based on the ability of the T-Uptake Unit to better compensate for extremes in thyroxine binding protein levels than classical %Uptake calculations.

NOTE: To ensure consistency, report all proficiency testing results in T-Uptake Units. Refer to the EXPECTED VALUES section of this package insert.

The ARCHITECT iSystem provides an option for transforming the T-Uptake Units to %Uptake equivalents. T-Uptake and $\%T_3$ Uptake both respond to variations in TBG concentration. However, $\%T_3$ Uptake also responds to variations in T_4 levels. Since T-Uptake and $\%T_3$ Uptake do not measure the same exact phenomenon, a direct conversion of units to % transformed is not possible and thus the % transformed value should be viewed as an approximation only.

- The alternate result unit, %Uptake, may be selected for reporting results by configuring "Result units" to %Uptake in the Configure Result units window. In addition to configuring result units, you must edit the general assay parameters "Low Normal Uptake" and "High Normal Uptake" values in the Configure Assay parameters - general view window.
  - Low Normal Uptake is the lower limit value of your reference radioimmunoassay $\%T_3$ Uptake normal range.
  - High Normal Uptake is the upper limit value of your reference radioimmunoassay $\%T_3$ Uptake normal range.

WARNING: If the result unit is changed, all previous control information will be lost. Also be aware that this assay is used in a calculated assay formula, and the formula may become invalid if units do not match.

- For information on configuring assay settings, refer to the ARCHITECT System Operations Manual, Section 2.
- The Low Normal Uptake and High Normal Uptake values are used to obtain a mean normal that is factored into the transformed equation. This transformation, which is based on the following equation, is automatically performed by the ARCHITECT iSystem when the alternate unit, %Uptake, is selected and the Low and High Normal Uptake values are configured accordingly.

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

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

- The ARCHITECT iSystem will not transform %Uptake results to T-Uptake Units upon completion of a run. Thus, if required, %Uptake can be transformed to T-Uptake Units manually with the following equation.

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

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

NOTE: If you are reporting results in T-Uptake Units, the Low Normal Uptake and High Normal Uptake values will not need to be edited. They should remain at their default values of "0.00".

The transformed %Uptake values may differ from measured $\%T_3$ 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.
  - $\%T_3$ Uptake – Unsaturated binding capacity of binding proteins.
- T-Uptake levels for Hypothyroid and Hyperthyroid subjects are generally within the normal range.
- $\%T_3$ Uptake is sensitive to both binding protein concentration and T_4 levels.

Calculation of FTI

- The FTI value can be calculated when both ARCHITECT T-Uptake and ARCHITECT Total T_4 results are obtained for the same sample.
- The ARCHITECT iSystem (ARCHITECT software version 2.00 or higher) can automatically calculate the FTI value. For information on configuring a calculated assay, refer to the ARCHITECT System Operations Manual, Section 2.
- The FTI value can be calculated with any of the following formulas:
  - $\frac{\text{Total } T_4}{\text{T-Uptake Unit}}$
  - Total T_4 x %Uptake
  - Total T_4 x $\frac{\text{\%Uptake}}{100\%}$

NOTE: When configuring a calculated assay, the created formula must use units that are consistent with the result units currently selected for the ARCHITECT T-Uptake assay.

- The ARCHITECT T-Uptake assay better compensates for extreme thyroxine binding protein levels than the transformed $\%T_3$ Uptake value. Therefore, the T-Uptake Unit derived FTI calculation may have better clinical utility in situations of abnormally low or high thyroxine binding protein levels than FTI values derived using transformed %Uptake values.

Flags

Some results may contain information in the Flags field. For a description of the flags that may appear in this field, refer to the ARCHITECT System Operations Manual, Section 5.

LIMITATIONS OF THE PROCEDURE

- For diagnostic purposes, the ARCHITECT T-Uptake values should be used in conjunction with a Total T_4 determination to yield the FTI.
- Performance of this assay has not been established with neonatal specimens.
- Specimens from patients who have received preparations of mouse monoclonal antibodies for diagnosis or therapy may contain human anti-mouse antibodies (HAMA). Such specimens may show either falsely elevated or depressed values when tested with assay kits that employ mouse monoclonal antibodies. Additional clinical or diagnostic information may be required to determine patient status.[16, 17]
- Heterophilic antibodies in human serum can react with reagent immunoglobulins, interfering with *in vitro* immunoassays. The presence of heterophilic antibodies in a patient specimen may cause anomalous values to be observed. Additional information may be required for diagnosis.[18]

EXPECTED VALUES

ARCHITECT T-Uptake values are expressed as dimensionless units with a value of 1.0 representing a normal binding capacity. A reference range study was conducted based on guidance from the National Committee for Clinical Laboratory Standards (NCCLS) Protocol C28-A2.[19] The suggested range for ARCHITECT T-Uptake is 0.69 - 1.41 T-Uptake Units. The suggested FTI range is 5.06 - 9.42 µg/dL. These ranges (central 95%) represent the T-Uptake values obtained by testing 150 specimens classified as normal by the ARCHITECT TSH and ARCHITECT Free T_4 assays. Due to differences in calculation methods, normal ranges may vary for different methodologies. Normal ranges may also vary across populations. It is recommended that each laboratory establish its own normal ranges.

Women who are pregnant or taking oral contraceptives can be expected to have elevated T-Uptake values. Individuals with low serum TBG levels will tend to have a lower T-Uptake value than normal.[7-9]

NOTE: PROFICIENCY TESTING RESULTS

To ensure consistency, all proficiency testing results should be reported in T-Uptake Units. Do not report transformed %Uptake values because reference ranges differ between laboratories and will not accurately reflect inter-laboratory variation.

SPECIFIC PERFORMANCE CHARACTERISTICS

Precision

The ARCHITECT T-Uptake assay precision is ≤ 7% total CV for samples ≥ 0.49 T-Uptake Units. A study was performed with the ARCHITECT T-Uptake assay based on guidance from the NCCLS Protocol EP5-A.[20] Samples were assayed in replicates of two at two separate times per day for 20 days. Data from this study are summarized in the following table.*

				Mean	Within Run		Total	
Sample	Instrument	Reagent Lot	n	(T-Uptake units)	SD	%CV	SD	%CV
Control 1	1	1	80	0.55	0.012	2.21	0.026	4.79
Control 1	1	2	80	0.53	0.011	2.13	0.020	3.87
Control 1	2	2	80	0.53	0.015	2.84	0.015	2.91
Control 2	1	1	80	0.95	0.011	1.19	0.036	3.84
Control 2	1	2	80	0.90	0.010	1.09	0.027	2.99
Control 2	2	2	80	0.90	0.011	1.18	0.015	1.68
Control 3	1	1	80	1.38	0.013	0.94	0.046	3.30
Control 3	1	2	80	1.30	0.013	0.97	0.032	2.44
Control 3	2	2	80	1.32	0.010	0.78	0.018	1.35
Panel 1	1	2	80	0.80	0.006	0.81	0.023	2.82
Panel 1	2	2	80	0.79	0.011	1.37	0.015	1.87
Panel 2	1	2	80	1.07	0.011	1.00	0.026	2.47
Panel 2	2	2	80	1.06	0.014	1.34	0.017	1.56
Panel 3	1	2	80	1.58	0.017	1.09	0.036	2.26
Panel 3	2	2	80	1.60	0.016	0.99	0.023	1.45

* Representative data; results in individual laboratories may vary from these data.

Specificity

The ARCHITECT T-Uptake assay uses anti-TBG-coated microparticles and T_4-acridinium conjugate to measure the total binding capacity of serum for T_4 via the measure of TBG activity. TBG is the dominant thyroxine binding protein of serum.[1] Thus, TBG activity is a strong indicator of T-Uptake. Interference due to T_4 autoantibodies is not expected. Such antibodies form soluble complexes that would be removed during the wash step of the assay.

Interference

Potential interference from elevated levels of bilirubin, hemoglobin, triglycerides, and total protein in the ARCHITECT T-Uptake assay is ≤ 10% at the levels indicated in the table below. A study based on guidance from the NCCLS Protocol EP7-A[21] was performed for the ARCHITECT T-Uptake assay. Known amounts of TBG were added to pooled serum to yield samples with values of 0.57 and 1.80 T-Uptake Units. These samples were tested with the following potentially interfering substances.

Potentially Interfering Substance	Potentially Interfering Substance Concentration
Bilirubin	20 mg/dL
Hemoglobin	1000 mg/dL
Total Protein (Low)	3 g/dL
Total Protein (High)	10 g/dL
Triglycerides	2000 mg/dL

Evaluation of Potentially Interfering Clinical Conditions

The ARCHITECT T-Uptake assay was evaluated using specimens with HAMA and Rheumatoid Factor (RF) to further assess the clinical specificity. Interference from these specimen types in the ARCHITECT T-Uptake assay is ≤ 10%. Ten specimens positive for HAMA and ten specimens positive for RF were evaluated for % Interference. Known amounts of TBG were added to the specimens, yielding samples with values between 1.34 and 1.64 T-Uptake Units. Results are summarized in the following table.*

Clinical Condition	Number of Specimens	Highest Observed % Interference
HAMA	10	-2.0
RF	10	-9.2

* Representative data; results in individual laboratories may vary from these data.

Carryover

There was no significant carryover (mean difference < 0.01 T-Uptake Units, ± 0.02 SD) when a high sample (1.86 T-Uptake Units) was assayed in front of the ARCHITECT T-Uptake Low Control (0.49 T-Uptake Units).

High Dose Hook

High dose hook is a phenomenon whereby very high level specimens may read within the dynamic range (0.2 - 1.9 T-Uptake Units) of the assay. For the ARCHITECT T-Uptake assay, no high dose hook effect was observed when a high sample (12 mg/dL TBG; > 1.89 T-Uptake Units) was assayed.

Accuracy by Correlation

The ARCHITECT T-Uptake assay was compared to the Abbott AxSYM T-Uptake assay. The method comparison correlation coefficient (r) is ≥ 0.95 and the method comparison slope is 1.0 ± 0.20. Data from the study were analyzed using the Passing-Bablok[22] regression method. Results are summarized in the following table.*

ARCHITECT T-Uptake vs. AxSYM T-Uptake				
Regression Method	n	Slope (95% CI)	Intercept (95% CI)	Correlation Coefficient (r)
Passing-Bablok**	338	1.019 (1.000 - 1.059)	0.027 (-0.004 - 0.050)	0.956

Sample Range (ARCHITECT T-Uptake): 0.49 - 1.89 T-Uptake Units

Sample Range (AxSYM T-Uptake): 0.42 - 1.75 T-Uptake Units

* Representative data; results in individual laboratories may vary from these data.

** A linear regression method with no special assumptions regarding the distribution of the samples and measurement errors.

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Key to Symbols

	Consult instructions for use
	Manufacturer
	Sufficient for
	Temperature limitation
	Use by/Expiration date
ASSAY DILUENT	Assay Diluent
CONJUGATE	Conjugate
CONTAINS: AZIDE	Contains Sodium Azide. Contact with acids liberates very toxic gas.
CONTROL NO.	Control Number
DANGER: REPRODUCTIVE HAZARD	Danger: Reproductive Hazard
EC REP	Authorized Representative in the European Community
INFORMATION FOR USA ONLY	Information needed for United States of America only
IVD	*In Vitro* Diagnostic Medical Device
LOT	Lot Number
MICROPARTICLES	Microparticles
PRE-TRIGGER SOLUTION	Pre-Trigger Solution
PRODUCED FOR ABBOTT BY	Produced for Abbott by
PRODUCT OF USA	Product of USA
REACTION VESSELS	Reaction Vessels
REAGENT LOT	Reagent Lot
REF	List Number
REPLACEMENT CAPS	Replacement Caps
SAMPLE CUPS	Sample Cups
SEPTUM	Septum
SN	Serial number
TRIGGER SOLUTION	Trigger Solution
WARNING: SENSITIZER	Warning: May cause an allergic reaction.
WASH BUFFER	Wash Buffer


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