



**Rat Thyroid
96-Well Plate Assay
Cat. # RTHY-30K**

MILLIPLEX[®] MAP

RAT THYROID HORMONE PANEL KIT 96 Well Plate Assay

#RTHY-30K

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By purchasing this product, which contains fluorescently labeled microsphere beads authorized by Luminex Corporation ("Luminex"), you, the customer, acquire the right under Luminex's patent rights, if any, to use this product or any portion of this product, including without limitation the microsphere beads contained herein, only with Luminex's laser based fluorescent analytical test instrumentation marketed under the name of Luminex 100[™] IS, 200[™], HTS.

INTRODUCTION

Triiodothyronine (T3) and thyroxine (T4) are key hormones secreted from the thyroid gland with a wide-range of biological effects including the metabolism of carbohydrates, fatty acids, and proteins. In addition these hormones play a vital role in the development of the central nervous and skeletal systems. The syntheses and release of T3 and T4 are regulated by Thyroid-Stimulating Hormone (TSH), which is secreted from the anterior pituitary gland. Together, these thyroid hormones play critical roles in the regulation of energy balance and mental and physical development. According to some studies, the simultaneous measurement of T3, T4 and TSH is of greater value than individual measurements, especially when monitoring disease relapse or therapeutic response.

Millipore recognizes the integral role that thyroid hormones play in homeostasis and is, therefore, proud to announce that the former LINCOp^{lex} Rat Thyroid Panels now have the MILLIPLEX® MAP optimized format. While you will immediately recognize the quality and reproducibility that you have always trusted, you will also enjoy the enhancements that we have built into MILLIPLEX MAP.

Millipore's MILLIPLEX® MAP Rat Thyroid Panels are to be used for the simultaneous quantification of T3, T4 and TSH in rat tissue extract or cell/tissue culture supernatant samples. The panel provides biomedical researchers using rat models with quality tools for the study of embryonic development, metabolic homeostasis, and thyroid-related diseases such as Grave's Disease, hyper- and hypothyroidism.

This kit is for research purposes only.

Please read entire protocol before use.

It is important to use same assay incubation conditions throughout your study.

PRINCIPLE

MILLIPLEX® MAP is based on the Luminex® xMAP® technology — one of the fastest growing and most respected multiplex technologies offering applications throughout the life sciences and capable of performing a variety of bioassays including immunoassays on the surface of fluorescent-coded beads known as microspheres.

- Luminex® uses proprietary techniques to internally color-code microspheres with two fluorescent dyes. Through precise concentrations of these dyes, 100 distinctly colored bead sets can be created, each of which is coated with a specific capture antibody.
- After an analyte from a test sample is captured by the bead, a biotinylated detection antibody is introduced.
- The reaction mixture is then incubated with Streptavidin-PE conjugate, the reporter molecule, to complete the reaction on the surface of each microsphere.
- The microspheres are allowed to pass rapidly through a laser which excites the internal dyes marking the microsphere set. A second laser excites PE, the fluorescent dye on the reporter molecule.
- Finally, high-speed digital-signal processors identify each individual microsphere and quantify the result of its bioassay based on fluorescent reporter signals.

The capability of adding multiple conjugated beads to each sample results in the ability to obtain multiple results from each sample. Open-architecture xMAP® technology enables multiplexing of many types of bioassays reducing time, labor and costs over traditional methods.

STORAGE CONDITIONS UPON RECEIPT

- Recommended storage for kit components is 2 - 8 °C.
- Once the standards and controls have been reconstituted, immediately transfer contents into polypropylene vials. **DO NOT STORE RECONSTITUTED STANDARDS OR CONTROLS IN GLASS VIALS.** For long-term storage, freeze reconstituted standards and controls at ≤ -20 °C. Avoid multiple (>2) freeze/thaw cycles.
- **DO NOT FREEZE Antibody-Immobilized Beads, Detection Antibodies, and Streptavidin-Phycoerythrin.**

REAGENTS SUPPLIED

Note: Store all reagents at 2 – 8 °C

REAGENTS SUPPLIED	CATALOG NUMBER	VOLUME	QUANTITY
Rat Thyroid Standard	LRTH-8030	lyophilized	1 vial
Quality Controls 1 and 2	LRTH-6030	lyophilized	2 vials
Serum Matrix Note: Contains 0.08% Sodium Azide	LHED-SD	lyophilized	1 vial (required for serum and plasma samples only)
Set of one 96-Well Filter Plate with 2 Sealers	MX-PLATE	-----	1 plate 2 sealers
Assay Buffer	LE-ABGLP	30 mL	2 bottles
10X Wash Buffer Note: Contains 0.05% Proclin	L-WB	30 mL	1 bottle
Rat Thyroid Detection Antibodies	LRTH-1030	5.5 mL	1 bottle
HRP Conjugate	LRTH-HRP	3 mL	1 bottle
Streptavidin-Phycoerythrin	L-SAPE	5.5 mL	1 bottle
Mixing Bottle	-----	-----	1 bottle

Included Rat Thyroid Hormone Antibody-Immobilized Beads are dependent on customizable selection of analytes within the panel.

Rat Thyroid Hormone Antibody-Immobilized Beads:

Bead/Analyte Name	Luminex Bead Region	Customizable 3 Analytes (20X concentration, 200µL)	
		Available	Cat. #
Anti – T3 Bead	24	✓	RT3
Anti – T4 Bead	27	✓	RT4
Anti – TSH Bead	41	✓	RTSH

MATERIALS REQUIRED BUT NOT PROVIDED

Reagents

1. Luminex Sheath Fluid (Luminex Catalogue #40-50000)

Instrumentation / Materials

1. Adjustable Pipettes with Tips capable of delivering 5 μ L to 1000 μ L
2. Multichannel Pipettes capable of delivering 5 μ L to 50 μ L or 25 μ L to 200 μ L
3. Reagent Reservoirs
4. Polypropylene Microfuge Tubes
5. Rubber Bands
6. Absorbent Pads
7. Laboratory Vortex Mixer
8. Sonicator (Branson Ultrasonic Cleaner Model #B200 or equivalent)
9. Titer Plate Shaker (Lab-Line Instruments Model #4625 or equivalent)
10. Vacuum Filtration Unit (Millipore Vacuum Manifold Catalog #MSVMHTS00 or equivalent with Millipore Vacuum Pump Catalog #WP6111560 or equivalent)
11. Luminex 100™ IS, 200™, or HTS by Luminex Corporation
12. Plate Stand (Millipore Catalog # MX-STAND)

SAFETY PRECAUTIONS

- All blood components and biological materials should be handled as potentially hazardous. Follow universal precautions as established by the Centers for Disease Control and Prevention and by the Occupational Safety and Health Administration when handling and disposing of infectious agents.
- Sodium Azide or Proclin has been added to some reagents as a preservative. Although the concentrations are low, Sodium Azide and Proclin may react with lead and copper plumbing to form highly explosive metal azides. On disposal, flush with a large volume of water to prevent azide build up.

TECHNICAL GUIDELINES

To obtain reliable and reproducible results, the operator should carefully read this entire manual and fully understand all aspects of each assay step before running the assay. The following notes should be reviewed and understood before the assay is set up.

- FOR RESEARCH USE ONLY. NOT FOR USE IN DIAGNOSTIC PROCEDURES.
- Do not use beyond the expiration date on the label.
- Do not mix or substitute reagents with those from other lots or sources.
- The Antibody-Immobilized Beads are light sensitive and must be protected from light at all times. Cover the assay plate containing beads with opaque plate lid or aluminum foil during all incubation steps.
- It is important to allow all reagents to warm to room temperature (20-25°C) before use in the assay.

- The bottom of the Microtiter Filter Plate should not be in direct contact with any surface during assay set-up or incubation times. The plate can be set on a plate stand or on the non-flat side of the plate cover or any other plate holder to raise the plate from the surface. A plate stand can be purchased separately from Millipore (Millipore Catalog #MX-STAND).
- Incomplete washing can adversely affect the assay outcome. All washing must be performed with the Wash Buffer provided.
- After the wash steps, keep the bottom of the Microtiter Filter Plate clean by blotting on paper towels or absorbent pads to prevent any leakage due to capillary action.
- Keep the vacuum suction on the plate as low as possible. It is recommended to have a vacuum setting that will remove 200 μ L of buffer in \geq 5 seconds (equivalent to $<$ 100 mmHg).
- After hydration, all Standards and Controls must be transferred to polypropylene tubes.
- The Standards prepared by serial dilution must be used within 1 hour of preparation. Discard any unused standards except the standard stock which may be stored at \leq -20°C for 1 month and at \leq -80°C for greater than one month.
- If samples fall outside the dynamic range of the assay, further dilute the samples with the appropriate diluent and repeat the assay.
- Any unused mixed Antibody-Immobilized Beads may be stored in the Mixing Bottle at 2-8°C for up to one month.
- During the preparation of the standard curve, make certain to mix the higher concentration well before making the next dilution. Use a new tip with each dilution.
- The plate should be read immediately after the assay is finished. If, however, the plate cannot be read immediately, seal the plate, cover with aluminum foil or an opaque lid, and store the plate at 2-8°C for up to 24 hours. Prior to reading, agitate the plate on the plate shaker at room temperature for 10 minutes. Delay in reading a plate may result in decreased sensitivity for some analytes.
- The titer plate shaker should be set at a speed to provide maximum orbital mixing without splashing of liquid outside the wells. For the recommended plate shaker, this would be a setting of 5-7 which is approximately 500-800 rpm.
- Ensure that the needle probe is clean. This may be achieved by sonication and/or alcohol flushes. Adjust probe height according to the protocols recommended by Luminex to the kit filter plate using 3 alignment discs prior to reading an assay.
- For cell culture supernatants or tissue extraction, use the culture or extraction medium as the matrix solution in background, standard curve and control wells. If samples are diluted in Assay Buffer, use the Assay Buffer as matrix.
- For serum/plasma samples, use the Serum Matrix provided in the kit.
- For cell/tissue homogenate, the final cell or tissue homogenate should be prepared in a buffer that has a neutral pH, contains minimal detergents or strong denaturing detergents, and has an ionic strength close to physiological concentration. Avoid debris, lipids, and cell/tissue aggregates. Centrifuge samples before use.
- Vortex all reagents well before adding to plate.

SAMPLE COLLECTION AND STORAGE

A. Preparation of Serum Samples:

- Allow the blood to clot for at least 30 minutes before centrifugation for 10 minutes at 1000xg. Remove serum and assay immediately or aliquot and store samples at $\leq -20^{\circ}\text{C}$.
- Avoid multiple (>2) freeze/thaw cycles.
- When using frozen samples, it is recommended to thaw the samples completely, mix well by vortexing and centrifuge prior to use in the assay to remove particulates.
- Serum samples should be diluted 1:5 in the Assay Buffer provided in the kit (e.g. adding 20 μL of serum to 80 μL Assay Buffer) before addition to sample wells.

B. Preparation of Plasma Samples:

- Plasma collection using EDTA as an anticoagulant is recommended. Centrifuge for 10 minutes at 1000xg within 30 minutes of blood collection. Remove plasma and assay immediately or aliquot and store samples at $\leq -20^{\circ}\text{C}$.
- Avoid multiple (>2) freeze/thaw cycles.
- When using frozen samples, it is recommended to thaw the samples completely, mix well by vortexing and centrifuge prior to use in the assay to remove particulates.
- Plasma samples should be diluted 1:5 in the Assay Buffer provided in the kit (e.g. adding 20 μL of plasma to 80 μL Assay Buffer) before addition to sample wells.

C. Preparation of Tissue Culture Supernatant:

- Centrifuge the sample to remove debris and assay immediately or aliquot and store samples at $\leq -20^{\circ}\text{C}$.
- Avoid multiple (>2) freeze/thaw cycles.
- Tissue culture supernatant may require a dilution with an appropriate control medium prior to assay.

NOTE:

- A maximum of 25 μL per well of 1:5 diluted serum or plasma can be used. Tissue culture or other media may also be used. The sample dilution of tissue/cell extracts and culture media may vary.
- All samples must be stored in polypropylene tubes. **DO NOT STORE SAMPLES IN GLASS.**
- Avoid debris, lipids and cells when using samples with gross hemolysis or lipemia.
- Care must be taken when using heparin as an anticoagulant since an excess of heparin will provide falsely high values. Use no more than 10 IU heparin per mL of blood collected.
- All samples should be free of particles, excess lipids and precipitates. Particles in the samples may clog the sample probe. It is good practice to centrifuge samples before addition to sample wells.

PREPARATION OF REAGENTS FOR IMMUNOASSAY

A. Preparation of Antibody-Immobilized Beads

For individual vials of beads, sonicate each antibody-bead vial for 30 seconds; vortex for 1 minute. Add 150 μ L from each antibody-bead vial to the Mixing Bottle and bring final volume to 3.0 mL with Assay Buffer. Vortex the mixed beads well. Unused portion may be stored at 2-8°C for up to one month.

Example 1: When using 3 rat thyroid antibody-immobilized beads, add 150 μ L from each of the 3 bead sets to the Mixing Bottle. Then add 2.55 mL Assay Buffer.

B. Preparation of Quality Controls

Before use, reconstitute Quality Control 1 and Quality Control 2 with 250 μ L deionized water. Invert the vial several times to mix and vortex. Allow the vial to sit for 5-10 minutes and then transfer the controls to appropriately labeled polypropylene microfuge tubes. Unused portion may be stored at \leq -20°C for up to one month.

C. Preparation of Wash Buffer

Bring the 10X Wash Buffer to room temperature and mix to bring all salts into solution. Dilute 30 mL of 10X Wash Buffer with 270 mL deionized water. Store unused portion at 2-8°C for up to one month.

D. Preparation of Serum Matrix

This step is required for serum or plasma samples only.

Add 1.0 mL deionized water to the bottle containing lyophilized Serum Matrix. Mix well. Allow the bottle to sit for 5-10 minutes for complete reconstitution. Then add 4.0 mL of Assay Buffer to the bottle and mix well for a final dilution of 1:5. This Serum Matrix may be frozen (\leq -20°C) and re-used twice. Serum Matrix should be used for background, standard and control wells.

E. Preparation of Rat Thyroid Standard

1.) Prior to use, reconstitute the Rat Thyroid Standard with 250 μ L deionized water to give a highest concentration of standard 6 (T3:10ng/mL, T4: 200 ng/mL, TSH: 10 ng/mL). Invert the vial several times to mix. Vortex the vial for 10 seconds. Allow the vial to sit for 5-10 minutes and then transfer the standard to an appropriately labeled polypropylene microfuge tube. The unused portion may be stored at \leq -20°C for up to one month.

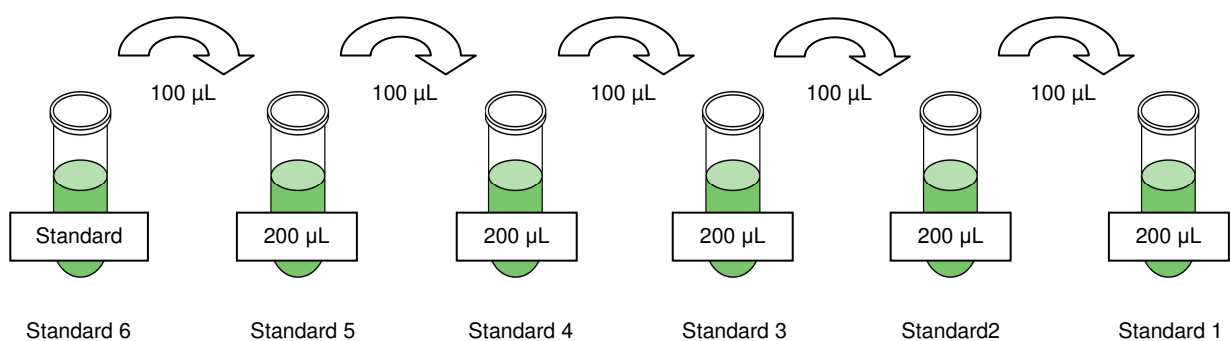
2.) Preparation of Working Standards

Label five polypropylene microfuge tubes Standard 5, Standard 4, Standard 3, Standard 2, and Standard 1. Add 200 μ L of Assay Buffer to each of the five tubes. Transfer 100 μ L of Standard 6 to the Standard 5 tube, mix well and transfer 100 μ L of the Standard 5 to the Standard 4 tube, mix well and transfer 100 μ L of Standard 4 to the Standard 3 tube, mix well and transfer 100 μ L of the Standard 3 to the Standard 2 tube, mix well and transfer 100 μ L of the Standard 2 to the Standard 1 tube. The 0 standard (Background) will be Assay Buffer.

Preparation of Rat Thyroid Standard

Standard Tube #	T3 and TSH (pg/ml)	T4 (pg/ml)	Volume of Deionized Water to Add	Volume of Standard to Add
6	10,000	200,000	250 μ L	0

Standard Tube#	T3 and TSH (pg/ml)	T4 (pg/ml)	Volume of Assay Buffer to Add	Volume of Standard to Add
5	3,333	66,667	200 μ L	100 μ L of Standard 6
4	1,111	22,222	200 μ L	100 μ L of Standard 5
3	370	7,407	200 μ L	100 μ L of Standard 4
2	124	2,469	200 μ L	100 μ L of Standard 3
1	41	823	200 μ L	100 μ L of Standard 2



MMUNOASSAY PROCEDURE

- Prior to beginning this assay, it is imperative to read this protocol completely and to thoroughly understand the Technical Guidelines.
- Allow all reagents to warm to room temperature (20-25°C) before use in the assay.
- Diagram the placement of Standards [0 (Background), tube # 1, 2, 3, 4, 5 and 6], Controls 1 and 2, and Samples on Well Map Worksheet in a vertical configuration. (Note: Most instruments will only read the 96-well plate vertically by default.) It is recommended to run the assay in duplicate.
- Set the filter plate on a plate holder at all times during reagent dispensing and incubation steps so that the bottom of the plate does not touch any surface.

1. Prewet the filter plate by pipetting 200 μ L of Assay Buffer into each well of the Microtiter Filter Plate. Seal and mix on a plate shaker for 10 minutes at room temperature (20-25°C).
2. Remove Assay Buffer by vacuum. (**NOTE: DO NOT INVERT PLATE.**) Blot excess Assay Buffer from the bottom of the plate with an absorbent pad or paper towels.
3. Add 25 μ L of each Standard or Control into the appropriate wells. Assay Buffer should be used for the 0 pg/mL standard (Background).
4. Add 25 μ L of Assay Buffer to the sample wells.
5. Add 25 μ L of appropriate matrix solution to the background, standards, and control wells. When assaying 1:5 diluted serum or plasma, use the diluted Serum Matrix provided in the kit. When assaying tissue/cell culture supernatant, use similar but analyte-free medium as the matrix solution.
6. Add 25 μ L of Sample into the appropriate wells. (Serum and plasma samples should be diluted 1:5 in Assay Buffer.)
7. Add 25 μ L HRP Conjugate into all wells.
8. Vortex Mixing Bottle and add 25 μ L of the beads to each well. (Note: During addition of Beads, shake bead bottle intermittently to avoid settling.)
9. Seal the plate with a plate sealer, cover it with the lid. Wrap a rubber band around the plate holder, plate and lid and incubate with agitation on a plate shaker overnight (16-18 hours) at 4°C.

Add 200 μ L Assay Buffer per well



Shake 10 min, RT

Vacuum

- Add 25 μ L Standard or Control to appropriate wells
- Add 25 μ L Assay Buffer to background and sample wells
- Add 25 μ L Matrix to background, standards and control wells
- Add 25 μ L Samples to sample wells
- Add 25 μ L HRP Conjugate to all wells
- Add 25 μ L Beads to each well



Incubate overnight at 4°C with shaking

10. Gently remove fluid by vacuum. **(NOTE: DO NOT INVERT PLATE.)**
11. Wash plate 3 times with 200 μ L/well of Wash Buffer, removing Wash Buffer by vacuum filtration between each wash. Blot excess Wash Buffer from the bottom of the plate with an absorbent pad or paper towels.
12. Add 50 μ L of Detection Antibodies into each well. **(Note: Allow the Detection Antibodies to warm to room temperature prior to addition.)**
13. Seal, cover with lid, and incubate with agitation on a plate shaker for 30 minutes at room temperature (20-25°C). **DO NOT VACUUM AFTER INCUBATION.**
14. Add 50 μ L Streptavidin-Phycoerythrin to each well containing the 50 μ L of Detection Antibodies. **(Note: Allow the SAPE to warm to room temperature prior to addition.)**
15. Seal, cover with lid and incubate with agitation on a plate shaker for 30 minutes at room temperature (20-25°C).
16. Gently remove all contents by vacuum. **(NOTE: DO NOT INVERT PLATE.)**
17. Wash plate 3 times with 200 μ L/well Wash Buffer, removing Wash Buffer by vacuum filtration between each wash. Wipe any excess buffer on the bottom of the plate with a tissue.
18. Add 100 μ L of Sheath Fluid to all wells. Resuspend the beads on a plate shaker for 5 minutes.
19. Run plate on Luminex 100™ IS, 200™, or HTS.
20. Save and analyze the Median Fluorescent Intensity (MFI) data using a weighted 5-parameter logistic or spline curve-fitting method for calculating cytokines/chemokines concentrations in samples.



Vacuum and wash
3X with 200 μ L
Wash Buffer

Add 50 μ L Detection
Antibodies per well



Incubate 30
minutes at RT

Do Not Vacuum

Add 50 μ L Streptavidin-
Phycoerythrin per well



Incubate for 30
minutes at RT

Vacuum and wash
3X with 200 μ L
Wash Buffer

Add 100 μ L Sheath Fluid per
well

Read on Luminex (50 μ L,
50 beads per bead set)

EQUIPMENT SETTINGS

These specifications are for the Luminex 100™ IS v.1.7 or Luminex 100™ IS v2.1/2.2, Luminex 200™ v2.3, xPONENT, and Luminex HTS. Luminex instruments with other software (e.g. MasterPlex, StarStation, LiquiChip, Bio-Plex, LABScan100) would need to follow instrument instructions for gate settings and additional specifications from the vendors.

Events:	50, per bead	
Sample Size:	50 µL	
Gate Settings	8,000 to 15,000	
Reporter Gain:	Default (Low PMT)	
Time Out	60 seconds	
Bead Set:	3-Plex Beads	
	T3	24
	T4	27
	TSH	41

QUALITY CONTROLS

The ranges for each analyte in Quality Control 1 and 2 are provided on the card insert or can be located at the MILLIPORE website www.millipore.com/techlibrary/index.do using the catalog number as the keyword.

ASSAY CHARACTERISTICS

Assay Sensitivities (minimum detectable concentrations, pg/mL)

MinDC: Minimum Detectable Concentration is calculated by the StatLIA® Immunoassay Analysis Software from Brendan Technologies. It measures the true limits of detection for an assay by mathematically determining what the empirical MinDC would be if an infinite number of standard concentrations were run for the assay under the same conditions.

Analyte	MinDC (pg/mL)
T3	99
T4	1074
TSH	7.4

Precision

Intra-assay precision is generated from the mean of the %CV's from 8 reportable results across two different concentrations of cytokines in one experiment. Inter-assay precision is generated from the mean of the %CV's from two reportable results each for two different concentrations of cytokine across 4 different experiments.

Intra-Assay Precision (CV%)	Inter-Assay Precision (CV%)
< 10%	< 5%

Accuracy

Spike Recovery: The data represent mean percent recovery of 6 levels of spiked standards in serum matrices in 8 independent experiments.

Analyte	% Recovery
T3	111%
T4	128%
TSH	79%

Cross-Reactivity

The antibody pair used in this assay is specific, and does not significantly cross-react with each other.

Mouse and other species T3:	100%
Mouse and other species T4:	100%
Mouse TSH:	N.D.

TROUBLESHOOTING GUIDE

Problem	Probable Cause	Solution
Filter plate will not vacuum	<p>Vacuum pressure is insufficient</p> <p>Samples have insoluble particles</p> <p>Sample too viscous</p>	<p>Increase vacuum pressure such that 0.2mL buffer can be suctioned in 3-5 seconds.</p> <p>Centrifuge samples just prior to assay set-up and use supernatant.</p> <p>If high lipid concentration, after centrifugation, remove lipid layer and use supernatant.</p> <p>May need to dilute sample.</p>
Insufficient bead count	<p>Vacuum pressure too high</p> <p>Bead mix prepared incorrectly</p> <p>Samples cause interference due to particulate matter or viscosity</p> <p>Probe height not adjusted correctly</p>	<p>Adjust vacuum pressure such that 0.2mL buffer can be suctioned in 3-5 seconds.</p> <p>Sonicate bead vials and vortex just prior to adding to bead mix bottle according to protocol. Agitate bead mix intermittently in reservoir while pipetting into the plate.</p> <p>See above. Also sample probe may need to be cleaned with alcohol flush, backflush and washes; or, if needed, probe should be removed and sonicated.</p> <p>Adjust probe to 3 alignment discs in well H6.</p>
Plate leaked	<p>Vacuum pressure too high</p> <p>Plate set directly on table or absorbent towels during incubations or reagent additions</p> <p>Insufficient blotting of filter plate bottom causing wicking</p> <p>Pipette touching plate filter during additions</p> <p>Probe height not adjusted correctly</p>	<p>Adjust vacuum pressure such that 0.2mL buffer can be suctioned in 3-5 seconds. May need to transfer contents to a new (prewetted) plate and continue.</p> <p>Set plate on plate stand or raised edge so bottom of filter is not touching any surface.</p> <p>Blot the bottom of the filter plate well with absorbent towels after each wash step.</p> <p>Pipette to the side of well.</p> <p>Adjust probe to 3 alignment discs in well H6.</p>
Background is too high	<p>Background wells were contaminated</p> <p>Matrix used has endogenous analyte or interference</p> <p>Insufficient washes</p>	<p>Avoid cross-well contamination by using sealer appropriately and by pipeting with multichannel pipets without touching reagent in plate.</p> <p>Check matrix ingredients for crossreacting components (e.g. interleukin modified tissue culture medium).</p> <p>Increase number of washes.</p>

Beads not in region or gate	<p>Luminex not calibrated correctly or recently</p> <p>Gate settings not adjusted correctly</p> <p>Wrong bead regions in protocol template</p> <p>Incorrect sample type used</p> <p>Instrument not washed or primed</p> <p>Beads were exposed to light</p>	<p>Calibrate Luminex based on instrument manufacturer's instructions at least once a week or if temperature has changed by $>3^{\circ}\text{C}$.</p> <p>Some Luminex instruments (e.g. Bio-Plex) require different gate settings than those described in the kit protocol. Use instrument default settings.</p> <p>Check kit protocol for correct bead regions or analyte selection.</p> <p>Samples containing organic solvents or if highly viscous should be diluted or dialyzed as required.</p> <p>Prime the Luminex 4 times to eliminate air bubbles. Wash 4 times with sheath fluid or water if there is any remnant alcohol or sanitizing liquid.</p> <p>Keep plate and bead mix covered with dark lid or aluminum foil during all incubation steps.</p>
Signal for whole plate is same as background	<p>Incorrect or no Detection Antibody was added</p> <p>Streptavidin-Phycoerythrin was not added</p>	<p>Add appropriate Detection Antibody and continue.</p> <p>Add Streptavidin-Phycoerythrin according to protocol. If Detection Antibody has already been vacuumed out, sensitivity may be low.</p>
Low signal for standard curve	<p>Detection Antibody may have been vacuumed out prior to adding Streptavidin Phycoerythrin</p> <p>Incubations done at incorrect temperatures, timings or agitation</p>	<p>May need to repeat assay if desired sensitivity not achieved.</p> <p>Assay conditions need to be checked.</p>
Signals too high, standard curves are saturated	<p>Calibration target value set too high</p> <p>Plate incubation was too long with standard curve and samples</p>	<p>With some Luminex instruments (e.g. Bio-Plex) default target setting for RP1 calibrator is set at High PMT. Use low target value for calibration and reanalyze plate.</p> <p>Use shorter incubation time.</p>
Sample readings are out of range	<p>Samples contain no or below detectable levels of analyte</p> <p>Samples contain analyte concentrations higher than highest standard point</p> <p>Standard curve was saturated at higher end of curve</p>	<p>If below detectable levels, it may be possible to use higher sample volume. Check with tech support for appropriate protocol modifications.</p> <p>Samples may require dilution and reanalysis for that particular analyte.</p> <p>See above.</p>

<p>High variation in samples and/or standards</p>	<p>Multichannel pipet may not be calibrated</p> <p>Plate washing was not uniform</p> <p>Samples may have high particulate matter or other interfering substances</p> <p>Plate agitation was insufficient</p> <p>Cross-well contamination</p>	<p>Calibrate pipets.</p> <p>Confirm all reagents are vacuumed out completely in all wash steps.</p> <p>See above.</p> <p>Plate should be agitated during all incubation steps using a vertical plate shaker at a speed where beads are in constant motion without splashing.</p> <p>Check when reusing plate sealer that no reagent has touched sealer.</p> <p>Care should be taken when using same pipet tips that are used for reagent additions and that pipet tip does not touch reagent in plate.</p>
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REPLACEMENT REAGENTS

Rat Thyroid Standard
Rat Thyroid Quality Controls 1 & 2
Serum Matrix
HRP Conjugate
Rat Thyroid Detection Antibodies
Streptavidin-Phycoerythrin
Assay Buffer
Set of two 96-Well Filter Plates with Sealers
10X Wash Buffer

Catalog #

LRTH-8030
LRTH-6030
LHED-SD
LRTH-HRP
LRTH-1030
L-SAPE
LE-ABGLP
MX-PLATE
L-WB

Antibody-Immobilized Beads

<u>Cytokine</u>	<u>Bead #</u>	<u>Cat. #</u>
T3	24	RT3
T4	27	RT4
TSH	41	RTSH

ORDERING INFORMATION

To place an order:

To assure the clarity of your custom Rat Thyroid Hormone kit order, please FAX the following information to our customer service department:

- Your name, telephone and/or fax number
- Customer account number
- Shipping and billing address
- Purchase order number
- Catalog number and description of product
- Quantity of kits
- Selection of MILLIPLEX™ Rat Thyroid Analytes/Serum Matrix Requirements

FAX: (636) 441-8050

Toll-Free US: (800) MILLIPORE

Mail Orders: Millipore Corp.
6 Research Park Drive
St. Charles, Missouri 63304 U.S.A.

For International Customers:

To best serve our international customers in placing an order or obtaining additional information about MILLIPLEX™ MAP products, please contact your multiplex specialist or sales representative or email our European Customer Service at customerserviceEU@Millipore.com.

Conditions of Sale

All products are for research use only. They are not intended for use in clinical diagnosis or for administration to humans or animals. All products are intended for *in vitro* use only.

Material Safety Data Sheets (MSDS)

Material Safety Data Sheets for Millipore products may be ordered by fax or phone or through our website at www.millipore.com/techlibrary/index.do.

WELL MAP

	1	2	3	4	5	6	7	8	9	10	11	12
A	0 Standard (Background)	Standard 4	QC-2 Control									
B	0 Standard (Background)	Standard 4	QC-2 Control									
C	Standard 1	Standard 5	Sample 1									
D	Standard 1	Standard 5	Sample 1									
E	Standard 2	Standard 6	Sample 2									
F	Standard 2	Standard 6	Sample 2									
G	Standard 3	QC-1 Control	Etc.									
H	Standard 3	QC-1 Control										