VN

Read this insert carefully before performing the assay and make sure you are using the most recent version of the package insert. The reliability of assay procedures other than those described in this package insert cannot be guaranteed.

28X05TE - 01VN Oct. 2024 (ver. 1)
☆Note Change

In Vitro Diagnostic Use

Chemiluminescent Enzyme Immunoassay Reagent

Lumipulse® G 25-OH Vitamin D Immunoreaction Cartridges

■ NAME

Lumipulse G 25-OH Vitamin D Immunoreaction Cartridges
(Also referred to as '25-OH Vitamin D Cartridges' in this package insert)

■ INTENDED USE

The Lumipulse G 25-OH Vitamin D Assay uses LUMIPULSE G System (with chemiluminescent enzyme immunoassay (CLEIA) technology) for the quantitative determination of 25- hydroxyvitamin D (25-OH Vitamin D) in human serum or plasma to be used in the assessment of vitamin D sufficiency. Assay results should be used in conjunction with other clinical and laboratory data to assist the clinician in making individual patient management decisions in an adult population. This product is for *in vitro* diagnostic use and professional use only.

■ SUMMARY AND EXPLANATION OF THE ASSAY

Vitamin D is a fat-soluble steroid hormone precursor present in two forms, vitamin D_2 (ergocalciferol) and vitamin D_3 (cholecalciferol). Vitamin D_3 is endogenously synthesized in the skin by exposure to sunlight while vitamin D_2 is taken up from dietary sources.

In the human circulatory system, biologically inert vitamin D_2 and vitamin D_3 are bound to the vitamin D binding protein and are transported to the liver to undergo hydroxylation on carbon 25 generating 25-OH vitamin D followed by hydroxylation on carbon 1 in the kidney to generate the biologically active form 1,25-dihydroxy vitamin D (1,25-$(OH)_2$ vitamin D).[1-2)]

Circulating 25-OH vitamin D is widely acknowledged as the indicator of vitamin D status for several reasons. It is the major storage form of vitamin D in blood with a half-life around 2-3 weeks while the biologically active form (1,25-$(OH)_2$ vitamin D) has shorter lifetime in serum and is present in levels approximately a thousand-fold less than 25-OH vitamin D. Further, as a patient becomes vitamin D deficient the renal production of 1,25-$(OH)_2$ vitamin D may increase as a result of increased secretion of parathyroid hormone (PTH) making 1,25-$(OH)_2$ vitamin D clinically irrelevant for the assessment of vitamin D sufficiency.[3)]

Vitamin D deficiency was associated with the bone deforming disease rickets in children almost a century ago, and is also well known to impair bone metabolism and to cause musculoskeletal disease such as osteomalacia, osteoporosis and muscle weakness.[2-3)]

More recent research has shown that most cells and tissues in the body have a vitamin D receptor and more than 200 genes have been found to be directly or indirectly regulated by vitamin D.[4)] Vitamin D insufficiency is now recognised as a worldwide problem linked not only to impaired bone metabolism but also to a multitude of chronic diseases including cardiovascular disease, diabetes, autoimmune disease, psychiatric diseases and various forms of cancer.[2, 4-7)]

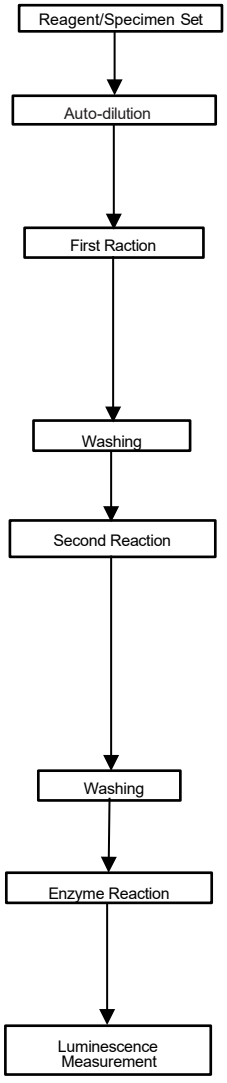
It is required that 25-OH vitamin D assays measure both 25-OH vitamin D_2 and 25-OH vitamin D_3 since the proportion of 25-OH vitamin D_2 to 25-OH vitamin D_3 vary between individuals.[1, 3, 8-10)]

The Lumipulse G 25‐OH Vitamin D Assay specifically measures 25‐OH vitamin D and shows equimolar sensitivity for 25-OH vitamin D_2 and 25-OH vitamin D_3.

☆■ PRINCIPLE OF THE PROCEDURE

Lumipulse G 25-OH Vitamin D is an assay system, including a set of immunoassay reagents, for the quantitative measurement of 25-OH vitamin D in specimens based on CLEIA technology[11)] by a two-step sandwich immunoassay method on the LUMIPULSE G System.

<Reaction Protocol;Dilution Two-Step Mode>



25-OH Vitamin D Calibrator or specimen is initially auto-diluted with Specimen Diluent 1 in the system.

25-OH vitamin D in specimens is separated from vitamin D binding protein and specifically bound to anti-25-OH vitamin D monoclonal antibody on the particles, and antigen-antibody immunocomplexes are formed.

The particles are washed and rinsed to remove unbound materials.

Alkaline phosphatase (ALP)‐labeled anti‐(25-OH vitamin D/anti-25-OH vitamin D monoclonal antibody immunocomplex) recombinant monoclonal antibody specifically binds to 25‐OH vitamin D immunocomplexes on the particles, and additional immunocomplexes are formed.

The particles are washed and rinsed to remove unbound materials.

Substrate Solution is added and mixed with the particles. AMPPD* contained in the Substrate Solution is dephosphorylated by the catalysis of ALP indirectly conjugated to particles.

Luminescence (at a maximum wavelength of 477 nm) is generated by the cleavage reaction of dephosphorylated AMPPD. The luminescent signal reflects the amount of 25‐OH vitamin D.

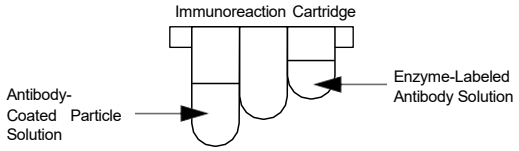
*AMPPD: 3-(2'-spiroadamantane)-4-methoxy-4-(3"-phosphoryloxy) phenyl-1, 2-dioxetane disodium salt

☆■ MATERIALS PROVIDED

Lumipulse G 25-OH Vitamin D Immunoreaction Cartridges: IRC
3 × 14 Tests **REF** 234013

1). Antibody-Coated Particle Solution
(Liquid when used, 250 µL/Immunoreaction Cartridge)
Contains anti-25-OH vitamin D monoclonal antibody-coated particles, protein stabilizers and chemical stabilizers in sodium chloride/Tris buffer. This solution contains gelatin and turns into gel at 15°C or lower.
Preservative: sodium azide

2). Enzyme-Labeled Antibody Solution
(Liquid, 320 µL/Immunoreaction Cartridge)
Contains alkaline phosphatase (ALP)‐labeled anti‐(25-OH vitamin D/ anti-25-OH vitamin D monoclonal antibody immunocomplex) recombinant monoclonal antibody, protein stabilizers and chemical stabilizers in sodium chloride/MES buffer.
Preservative: sodium azide



☆ ■ MATERIALS REQUIRED BUT PROVIDED SEPARATELY

1. Lumipulse G 25-OH Vitamin D Calibrators : CAL Liquid,

1 × 6 Concentrations

CAL1	0 ng/mL 25-OH Vitamin D calibrator (1 × 1.5 mL) (0 nmol/L 25-OH Vitamin D calibrator (1 × 1.5 mL))
CAL2	10 ng/mL 25-OH Vitamin D calibrator (1 × 1.5 mL) (25 nmol/L 25-OH Vitamin D calibrator (1 × 1.5 mL))
CAL3	20 ng/mL 25-OH Vitamin D calibrator (1 × 1.5 mL) (50 nmol/L 25-OH Vitamin D calibrator (1 × 1.5 mL))
CAL4	50 ng/mL 25-OH Vitamin D calibrator (1 × 1.5 mL) (125 nmol/L 25-OH Vitamin D calibrator (1 × 1.5 mL))
CAL5	100 ng/mL 25-OH Vitamin D calibrator (1 × 1.5 mL) (250 nmol/L 25-OH Vitamin D calibrator (1 × 1.5 mL))
CAL6	150 ng/mL 25-OH Vitamin D calibrator (1 × 1.5 mL) (375 nmol/L 25-OH Vitamin D calibrator (1 × 1.5 mL))

Contains calcifediol in sodium chloride in HEPES buffer with protein stabilizer. Preservative: sodium azide

Traceability

The calibrators for use with Lumipulse G 25-OH Vitamin D are prepared gravimetrically and are traceable to internal reference calibrator concentrations determined by UV spectrophotometric analysis and verified by Reference Method Procedure (University of Ghent).[12)]

2. Lumipulse G Substrate Solution: Liquid,

6 × 50 mL (For G600II)
6 × 100 mL (For G1200)

Contains AMPPD as a substrate in diethanolamine buffer with a chemical stabilizer. Preservative: sodium azide

3. Lumipulse G Wash Solution: Concentrate,

1 × 1000 mL

Contains sodium chloride in Tris buffer with a detergent. Preservative: sodium azide

4. Lumipulse G Specimen Diluent 1: Liquid,

4 × 80 mL (For G600II)
4 × 300 mL (For G1200)

Contains sodium chloride in Tris buffer with protein and chemical stabilizers.
Preservative: sodium azide

5. Sampling tips for LUMIPULSE SYSTEM (rack packed):

10 × 96 tips

Ready to use for G600II.

6. Sampling tips for LUMIPULSE SYSTEM:

12 × 96 tips

Ready to use for G1200.

7. Soda lime for LUMIPULSE SYSTEM:

6 × 2 tubes

Ready to use.

*Lumipulse G 25-OH Vitamin D Calibrators, Lumipulse G Substrate Solution, Lumipulse G Wash Solution and Lumipulse G Specimen Diluent 1 are also referred to in this package insert as '25-OH Vitamin D Calibrators', 'Substrate Solution', 'Wash Solution' and 'Specimen Diluent 1' respectively.

☆ ■ MATERIALS REQUIRED BUT NOT PROVIDED

1.Purified water

2.Control materials; refer to ■ **QUALITY CONTROL**

3.Micropipettes

4. Recommended sample cups or sample tubes; refer to the LUMIPULSE G System Operation Manual and ■ **SPECIMEN COLLECTION AND PREPARATION**. Blood collection tubes without anticoagulant can also be used as sample containers. Refer to the LUMIPULSE G System Operation Manual.

☆■ WARNINGS AND PRECAUTIONS

For *in vitro* diagnostic use only.

1. SAFETY PRECAUTIONS

Please refer to the safety data sheet (SDS) and product labeling for information on potentially hazardous components. Please make a contact with local distributors when you need the most recent SDS version.

EUH032: Contact with acids liberates very toxic gas.
EUH210: Safety data sheet available on request.

2. PRECAUTIONS FOR HANDLING

1). The products contain biological materials (See the ■ **MATERIALS PROVIDED** and ■ **MATERIALS REQUIRED BUT PROVIDED SEPARATELY**). No given tests can completely guarantee that infected materials are absent. Accordingly, such materials should be considered potentially infectious. To avoid a risk of infection when using these products and human specimens, wear disposable gloves to avoid direct contact to them. Do not perform pipetting by mouth and follow appropriate biosafety practice.[13)]

2). The following reagents contain sodium azide as a preservative. Avoid contact with skin, eyes or mouth.
Wash Solution: 1.0% (w/v) (before dilution)
Substrate Solution: 0.05% (w/v)
Antibody-Coated Particle Solution: 0.1% (w/v)
Enzyme-Labeled Antibody Solution: 0.1% (w/v)
Calibrators: 0.1% (w/v)
Specimen Diluent 1: 0.1% (w/v)

3). Lumipulse G Substrate Solution is an alkaline solution (pH 10). Handle carefully to avoid contact with skin, eyes, or mouth.

4). In the event of accidental contact of any reagent with skin, eyes or mouth, immediately rinse thoroughly with water and seek medical attention if necessary.

3. PRECAUTIONS FOR USE

1). Read through this package insert, the safety data sheet (SDS) and the LUMIPULSE G System Operation Manual. Follow their instructions. Incorrect use of the reagents, instrument, or other consumables may result in unreliable data or accident hazard.

2). The 25-OH Vitamin D Cartridges (Antibody-Coated Particle Solution/Enzyme-Labeled Antibody Solution), 25-OH Vitamin D Calibrators, Substrate Solution, Wash Solution and Specimen Diluent 1 are packed separately.

3). Do not use expired reagents.

4). To ensure measurement accuracy, always use freshly purified water.

5). Avoid using the reagents which may have been stored in an improper way.

6). Use new sampling tips and new sample cups or sample tubes as specified by the LUMIPULSE G System. Refer to the LUMIPULSE G System Operation Manual.

7). Bring the calibrators to room temperature (15-25°C). Mix the calibrators by gentle inversion.

8). Bubbles in a sample cup or sample tube sometimes make sampling errors. If large amounts of bubbles appear in the dispensing droplets of the 25-OH Vitamin D Calibrators, the volume of the calibrating solution may be insufficient to perform the assay. Please use new 25-OH Vitamin D Calibrators.
9). Start the 25-OH vitamin D assay immediately after sample setup to avoid evaporation of the specimen and 25-OH Vitamin D Calibrators.
10). Avoid removing the Substrate Solution until replacement is required. The Substrate Solution cannot be used if it is contaminated with ALP. Use new gloves when replacing the Substrate Solution.
11). Replace the Soda lime on the LUMIPULSE G System according to the LUMIPULSE G System Operation Manual.

4. PRECAUTIONS FOR WASTE

1). The reagents contain sodium azide as a preservative, as previously described (See **2. PRECAUTIONS FOR HANDLING**). Follow any applicable regulations for disposal. If flushing down the drain, use generous amount of water when discarding to prevent the formation of explosive metal azides.
2). Handle any medical waste produced by this assay in compliance with waste-related regulations in each country or region.
3). When any liquid such as specimen or assay waste is splashed, wipe and disinfect the whole area with an appropriate disinfectant such as sodium hypochlorite or ethanol.

☆ ■ STORAGE INSTRUCTIONS

Store the following reagents at 2-10 °C.

DO NOT FREEZE.

Product	Shelf life
Lumipulse G 25-OH Vitamin D Immunoreaction Cartridges	12 months

The 25-OH Vitamin D Cartridges can be stored on-board the LUMIPULSE G System for a maximum of 30 days.
When stored and handled properly, reagents remain stable until the expiration date. Refer to the expiration date shown on the immediate container labels.

■ INSTRUMENT

The reagents are designed for a fully automated chemiluminescent enzyme immunoassay (CLEIA) on the LUMIPULSE G System (LUMIPULSE G1200 and LUMIPULSE G600II as leading instrument). Refer to the LUMIPULSE G System Operation Manual for further information.

■ REAGENT PREPARATION

1. Lumipulse G 25-OH Vitamin D Immunoreaction Cartridges

25-OH Vitamin D Cartridges are filled with Antibody-Coated Particle Solution and Enzyme-Labeled Antibody Solution. Peel off the transparent film from the Immunoreaction Cartridge case before installing the case for measurement.

☆ 2. Lumipulse G 25-OH Vitamin D Calibrators

Bring to room temperature (15-25°C). Mix the calibrators by gentle inversion. Drip the required amount (more than 40 µL for duplicate measurement) of calibrators into the recommended sample cups or sample tubes, taking into account the dead volume which is at least 100 µL and 250 µL (total volume at least 140 µL and 290 µL) for sample cups and sample tubes, respectively. The approximate drip volume per drop of solution is 45 µL. The drip volume fluctuates depending on how hard the container is pressed and if any bubbles are present in the calibrator. Refer to the LUMIPULSE G System Operation Manual for recommended sample cups and sample tubes, and the dead volume of each type of sample cup and sample tube.

3. Lumipulse G Substrate Solution

Use as is. Refer to the LUMIPULSE G System Operation Manual for installing into the LUMIPULSE G System and the package insert of Lumipulse G Substrate Solution for general information. Ensure the substrate cap seal is properly installed to avoid air entering the system.

4. Lumipulse G Wash Solution

10 × concentrated solution. Prior to use, dilute 10 × with purified water and mix thoroughly. The diluted Wash Solution shall be brought to room temperature (15-25 °C). Refer to the LUMIPULSE G System Operation Manual for loading on to the LUMIPULSE G System and the package insert of Lumipulse G Wash Solution for general information.

5. Lumipulse G Specimen Diluent 1

Use as is. Refer to the LUMIPULSE G System Operation Manual for loading into the LUMIPULSE G System and the package insert of Lumipulse G Specimen Diluent 1 for general information.

■ SPECIMEN COLLECTION AND PREPARATION

1. It is recommended to use fresh specimens.
2. Specimens may be stored on the clot at 2-10°C for up to 2 days and after separation from the clot at 2-10°C for up to 7 days or at -10°C or below for up to 2 months.
3. Avoid more than 5 freeze/thaw cycles.
4. Specimens on-board the LUMIPULSE G System shall be tested within 3 hours.
5. Measurements may be affected by erythrocytes, fibrin, or other unspecified precipitates or debris contained in specimens . Centrifuge specimens that contain gross particulates to ensure accurate results.
6. Handle specimens carefully to avoid cross-contamination.
7. Human serum or plasma collected in sodium heparin, lithium heparin, or dipotassium EDTA anticoagulant tubes may be used in the Lumipulse G 25-OH Vitamin D.
   Follow the tube manufacturer's instructions for use.
   If the blood collection tubes other than the above are used, each laboratory should validate their applicability to the Lumipulse G 25-OH Vitamin D.
8. Dispense serum or plasma to the sample containers. Sample cups and sample tubes (blood collection tubes with no anticoagulant) may be used as the sample containers. Refer to the LUMIPULSE G System Operation Manual for the recommended sample cups and sample tubes.
9. The Lumipulse G 25-OH Vitamin D uses 20 µL of specimen for each assay. The dead volume is at least 100 µL and 250 µL when using recommended sample cups and sample tubes with the LUMIPULSE G System respectively. Therefore the total sample volume required per assay is over 120 µL for sample cups and 270 µL for sample tubes. The size of the sample tubes for the LUMIPULSE G System is described in the LUMIPULSE G System Operation Manual.
10. When shipped, package and label specimens in compliance with applicable regulations for the transport of clinical specimens and infectious substances.

■ ASSAY PROCEDURE

1. Refer to the LUMIPULSE G System Operation Manual and place the specimens and reagents needed for measurement in the specified locations.
2. Enter the assay requests of 25-OH Vitamin D Calibrators and specimens.
3. Before starting the assay, confirm that the required amounts of 25-OH Vitamin D Cartridges, Substrate Solution, diluted Wash Solution, Specimen Diluent 1 and Sampling tips are set on the LUMIPULSE G System.

4. Press the [Assay start] key to start the measurement.

■ CALIBRATION

1. Required Calibrators

Lumipulse G 25-OH Vitamin D Calibrators

2. Calibration Procedure

Refer to ■ **REAGENT PREPARATION**. For subsequent procedures, follow the LUMIPULSE G System Operation Manual.

3. When to calibrate

Calibration is performed in the following cases:

1). On the first assay of the Lumipulse G 25-OH Vitamin D.
2). When the 25-OH Vitamin D Cartridges is replaced with a different lot.
3). When quality control results fall out of the range.
4). When 30 days have elapsed since the previous calibration.

Update the calibration data whenever needed.

4. The calibrator must be tested in duplicate.

5. Measurement Range

4.0-150.0 ng/mL

■ RESULTS

The 25-OH vitamin D concentration of a specimen is automatically calculated from the calibration curve. The default unit for Lumipulse G 25-OH Vitamin D is ng/mL. An alternate unit of nmol/L may be used. Conversion formula: (Concentration in ng/mL) × 2.5 = nmol/L.

■ QUALITY CONTROL

1).Quality Control Material Preparation

Use control materials with at least two levels (e.g. low and high).

2).Quality Control Procedure

Refer to the package insert of control materials. Refer to Internal Quality Control Testing for further information. It is recommended to conduct Quality Control Testing at least once every 24 hours.

■ LIMITATIONS OF THE PROCEDURE

1.For comprehensive diagnosis, consider all the various factors including the results of other tests and clinical symptoms in addition to the values obtained with this product.

2.The results of different assay methods may not be interchanged due to differences in assay methods and reagent specificity. The results reported by the laboratory to the physician must include the identity of the 25-OH Vitamin D assay used.

3.Interference may be encountered with certain sera containing nonspecific and/or unidentified reactive substances.

4.Interfering Substances/Medications

The addition of endogenous substances does not affect the measured values. A list of tested compounds is shown in ■ **PERFORMANCE CHARACTERISTICS**. It cannot be excluded that other substances may affect the measurement results.

5.Specimens from patients routinely exposed to animals or animal serum products may contain heterophilic antibodies. The heterophilic antibodies are known to interfere with *in vitro* immunoassays because of their reactivity with the immunoglobulins of reagents.[15] Therefore, such specimens may show anomalous results. Due to unidentified nonspecific reactive substances that exist in specimens, data may occasionally be inaccurate.

■ EXPECTED VALUES

It is recommended that each laboratory establish its own range, which may be unique to the population it serves depending upon geographical, patient, and environmental factors.

There is considerable discussion of the serum concentrations of 25‐OH vitamin D associated with deficiency, adequacy for bone health and optimal overall health. In the past, vitamin D deficiency was defined as serum 25‐OH vitamin D below 10 ng/mL. The World Health Organization (WHO)[16] defined vitamin D insufficiency as serum 25-OH vitamin D below 20 ng/mL. However, others recently started to define vitamin D deficiency as serum 25‐OH vitamin D level below 20 ng/mL and vitamin D insufficiency as less than 30 ng/mL. [17]

A review of the available guidelines[16-18] suggests the following recommendations for 25-OH vitamin D levels:

Level	Ranges according World Health Organization[16]	Ranges according Endocrine Society Clinical Practice Guideline[17]
Deficient	＜10 ng/mL	＜20 ng/mL
Insufficient	10-19 ng/mL	21-29 ng/mL
Sufficient	20-100 ng/mL	30-100 ng/mL
Potential Toxicity	＞100 ng/mL	＞100 ng/mL

A study was conducted using 153 serum samples of apparently healthy individuals between the ages of 19-69 years. Samples came from a blood donor center in Europe. These samples were tested with the Lumipulse G 25-OH Vitamin D assay, the observed values are summarized below:

n	Observed values	
	Median	2.5th to 97.5th Percentile
153	27.6 ng/mL	17.6 ng/mL – 46.2 ng/mL

■ PERFORMANCE CHARACTERISTICS

1. Precision

The Lumipulse G 25-OH Vitamin D demonstrated precision ≦6% (total %CV) in a study run according to the Clinical and Laboratory Standards Institute (CLSI) Protocol EP5-A2[19]. Four human serum-based panels, four human plasma-based panels and three commercially available controls were assayed in replicates of two at two separate times of the day for 20 days (n=80 for each sample). Total CV combines Within-run, Between-run and Between-day precision data. Testing was performed on LUMIPULSE G System. Data from this study are summarized below.

Sample		n	Mean (ng/mL)	Within run CV	Total CV
Control	1	80	10.9	3.8%	6.3%
	2	80	34.0	1.3%	2.9%
	3	80	80.9	0.9%	2.3%
Panel (serum)	A	80	13.1	2.1%	3.1%
	B	80	31.2	1.7%	2.7%
	C	80	83.3	0.8%	2.3%
	D	80	115.9	0.8%	2.2%
Panel (plasma)	E	80	11.6	1.8%	3.4%
	F	80	25.8	1.5%	2.8%
	G	80	84.8	1.0%	2.1%
	H	80	114.5	1.0%	2.2%

2. Sensitivity

1). Analytical sensitivity

The limit of detection (LOD) for 25-OH vitamin D in this assay was 0.839 ng/mL, that is determined by parametric approach consistent with the Protocol EP17-A2 in the CLSI guideline,[20] and the result is obtained by using 60 blank samples and 60 low-level samples.

2). Functional sensitivity

The limit of quantitation (LOQ) for 25-OH vitamin D in this assay was found to be 3.491 ng/mL, determined by using precision profiles consistent with the Protocol EP17-A2 in the CLSI guideline, [20] and defined as the level with CV ≦10%.

3. Interference

The Lumipulse G 25-OH Vitamin D demonstrated an average interference of ≦10% (for each compound) in a study consistent with the guidelines in the CLSI Protocol EP7-A2. [21] Human serum specimens were supplemented with potentially interfering

compounds (HAMA, rheumatoid factor (RF), free bilirubin, conjugated bilirubin, triglycerides, hemoglobin, protein) at the levels indicated below:

- HAMA 1213 ng/mL
- Rheumatoid factor (RF) 1206 IU/mL
- Free bilirubin 18.3 mg/dL
- Conjugated bilirubin 20.6 mg/dL
- Triglycerides 1000 mg/dL
- Hemoglobin 10 g/dL
- Protein 4-12 g/dL

4. Specificity

4.1 Interference of drug substance

Interference study was conducted according to the guidelines in the CLSI Protocol EP7-A2[21]. The following compounds were evaluated in the Lumipulse G 25-OH Vitamin D at the concentrations listed and were found not to affect assay performance.

- Acetaminophen 1455 µmol/L
- Acetylsalicylic acid 3.65 mmol/L
- Alendronate 350 mg/L
- Ampicillin 344 µmol/L
- Ascorbic Acid 375 µmol/L
- Caffeine 309 µmol/L
- Chloramphenicol 155 µmol/L
- Digoxin 8.7 µmol/L
- EinsAlpha 3633 µg/L
- Hydrochlorothiazide 22.2 µmol/L
- Ibamdronate 52 mg/L
- Ibuprofen 2486 µmol/L
- Indomethacin 103 µmol/L
- Lidocaine 57.9 µmol/L
- Lovastatin 1932 µmol/L
- Metoprolol 18.7 µmol/L
- Naproxen 2247 µmol/L
- Pamidron 90 mg/L
- Risedronate 175 mg/L
- Theophylline 243 µmol/L
- Warfarin 37.5 µmol/L
- Zometa 4 mg/L

4.2 Cross-reactivity

Cross-reactivity to Ergocalciferol (Vitamin D_2), Colecalciferol (Vitamin D_3), 24,25-$(OH)_2$ vitamin D_3 , 1,25-$(OH)_2$ vitamin D_2, 1,25 $(OH)_2$ vitamin D_3, 3-epi-25-OH vitamin D_3, Paricalcitol was conducted according to the guidelines in the CLSI Protocol EP7-A2.[21] The results are shown below.

Tested compound	Concentration	Cross reactivity percentage
Vitamin D_2	1018 ng/mL	0.1%
Vitamin D_3	1012 ng/mL	0.0%
24,25-(OH)2 vitamin D3	101 ng/mL	5.6%
1,25-$(OH)_2$ vitamin D_2	104 ng/mL	46.3%
1,25-$(OH)_2$ vitamin D_3	102 ng/mL	54.7%
3-epi-25-OH vitamin D_3	100 ng/mL	19.9%
Paricalcitol	25 ng/mL	33.6%

5. Method comparison

Two method comparison studies consistent with the guidelines in the CLSI Protocol EP9-A2,[22] were performed where the Lumipulse G 25-OH Vitamin D assay (y) was compared with a LC-MS/MS method (x) and with a commercially available immunoassay (DiaSorin LIAISON 25- OH Vitamin D TOTAL Assay (x), respectively. Regression analysis was performed using the Passing-Bablok method. The sample concentrations were between approximately 5 ng/mL and 137 ng/mL (LC-MS/MS) and between 5 ng/mL and 58 ng/mL (DiaSorin LIAISON). Data from these studies are summarized in the table below.

Comparison Method	n	Slope	Intercept	Pearson correlation
LC-MS/MS	92	1.00	-2.0	0.99
DiaSorin LIAISON	243	1.04	0.1	0.93

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☆■ CONTACT

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☆ ■ GLOSSARY OF SYMBOLS

CE	CE Marking (European Regulation (EU) 2017/746 on in vitro diagnostic medical devices)		
EC REP	Authorised representative in the European Community		
IVD	In vitro diagnostic *Medical Device*	LOT	Batch Code
Σ n	Contains Sufficient for <n> Tests		Consult Instructions for Use
REF	Catalogue Number		Use-by date
	Keep Away from Sunlight		Temperature Limit
	Manufacturer		Fragile, handle with care
CONTENTS	Contents of the Kit	IRC	Immunoreaction Cartridges
CAL	Calibrators	CAL 1	Calibrator (1-6)
	Importer	MADE IN JAPAN	Made in Japan