

Serazym[®] Giardia

Enzyme immunoassay for the qualitative detection of *Giardia intestinalis*-specific protein (CWP-1) in stool samples of human origin.

REF	E-106		96
IVD	In-vitro-diagnostic medical device		CE

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IVD In-vitro diagnostic medical device	UDI Unique device identifier	Manufacturer
Country of manufacture and date of manufacture	REF Article number	SN Serial number
Keep away from sunlight	Humidity limitation	LOT Batch code
Consult instructions for use	Temperature limit	Do not reuse
Sufficient for <i>n</i> tests	Biohazard	Use-by date
		Attention

Intended Use

Serazym® Giardia is an IVD test for the qualitative determination of *Giardia intestinalis*-specific cyst wall protein 1 (CWP-1) in stool samples of human and animal origin from enrichment cultures through manual or semi-automatic processing by a laboratory professional user.

The test is intended as an aid in the diagnosis of giardiasis in samples from patients presenting with symptoms of gastroenteritis.

Principle of the Test

Serazym® Giardia is an enzyme immunoassay based on polyclonal antibodies against *Giardia intestinalis*-specific cyst wall protein 1 (CWP 1). Diluted, untreated stool samples as well as negative and positive controls are dispensed into wells of the microtiter plate coated with polyclonal anti-*Giardia* antibodies. After incubation unbound components are removed by a washing step and peroxidase (HRP)-labeled anti-*Giardia* antibodies are dispensed into the wells. After incubation and a washing step, HRP converts the colorless substrate solution to a blue reaction product in the following enzymatic reaction step. The reaction is stopped by the addition of stop solution, resulting in a color change from blue to yellow. The optical density (OD) of the reaction product measured at 450 nm measuring filter and ≥ 620 nm reference filter is directly proportional to the concentration of the specifically bound *Giardia intestinalis*-specific cyst wall protein 1 (CWP 1).

Test Components (Delivery Scope)

		For 96 Wells	
1	WELLS	Microtiter plate coated with < 10 µg/mL polyclonal anti- <i>Giardia</i> antibodies (sheep)	12 single breakable 8-well strips white color marking, vacuum-sealed with desiccant
2	WASHBUF (10x)	Wash buffer (10x) Seramun® Wash buffer A TRIS-based buffer	100 mL concentrate for 1000 mL solution, colorless, white cap
3	DIL	Sample diluent Seramun® Sample diluent A Phosphate-based buffer	100 mL, ready to use, colored yellow, black cap
4	CONTROL +	Positive control < 1 µg/mL recombinant <i>Giardia</i> <i>intestinalis</i> antigen	2.0 mL, ready to use, colored blue, red cap
5	CONTROL -	Negative control TRIS-based buffer	2.0 mL, ready to use, colored blue, green cap
6	CONJ HRP	HRP-conjugate < 5 µg/mL HRP-labeled polyclonal anti- <i>Giardia</i> CWP 1 antibodies (sheep)	15 mL, ready to use, colored green, green cap
7	SUBSTR	Substrate SeramunBlau® automat fast < 0.1 % 3,3',5,5'- tetramethylbenzidine; < 0.05 % hydrogen peroxide	15 mL, ready to use, colorless, blue cap
8	STOP	Stop solution SeramunBlau® stop 0.25 M sulphuric acid	15 mL, ready to use, colorless, yellow cap
9		Certificate of Analysis	1 piece
10		Instructions for Use	1 piece

Additional Materials and Aids Required for the Test Procedure

Adjustable single-channel micropipette • 8-channel micropipette or multi-channel micropipette with pipette tips • reagent container for multi-channel micropipettes • 8-channel wash comb with vacuum pump and waste bottle or microtiter plate washer • microtiter plate reader with 450 nm measuring filter and ≥ 620 nm reference filter • deionized water • measuring cylinder • tubes for sample preparation

Important Information



This device is for *in-vitro* diagnostic use only. Follow the instructions carefully. The kit may be used by health professionals only.

Do not use reagents from damaged packages or bottles. The shelf life specified must be observed. Do not mix components with reagents from other manufacturers.

Mixing of test kit components of different lots is permitted only for sample diluent, wash buffer, negative control, substrate and stop solution.

Wash buffer (10x), sample diluent, negative control, substrate and stop solution are universally applicable for Serazym[®] stool ELISA Adenovirus (E-017), Astrovirus (E-045), Norovirus (E-061), Rotavirus (E-020), Campylobacter (E-093), Clostridium difficile GDH (E-107), Clostridium difficile Toxin A+B (E-040), Cryptosporidium parvum (E-039), Entamoeba histolytica (E-018), Giardia (E-106) and H. pylori 2nd Gen. (E-114).

All serious incidents occurring in relation with Serazym[®] Giardia must be reported to the manufacturer and the competent authority of the EU member state in which user and/or patient are located.

Information on Assay Procedure

All reagents should be stored at 2...8 °C. Bring all test components to room temperature before use. Reagents that appear contaminated should not be used.

Each well of a microtiter plate can be used once only. Each sample and control have to be pipetted with a new pipette tip. Positive and negative controls are ready to use.

For larger sample series, pipetting reagents from liquid reservoirs using a multichannel micropipette is recommended to avoid time delays and contaminations. Follow the pipetting scheme and time schedules of the protocol.

The aspiration and washing steps can be performed manually or with the help of a microplate washer or waterjet pump. Allow the wash buffer to remain in the wells for at least 5 seconds per wash cycle. Remove wash buffer residues by thoroughly aspirating or tapping out the wells!

Protect the substrate from light!


Safety Instructions

Reagents must not be swallowed. Contact with skin or mucous membranes should be avoided.

Handle all components and patient samples as if potentially hazardous and infectious.

Additional information may be taken from the Material Safety Data Sheet.

Product contains the following hazardous component/-s:

Test component	Hazard labeling and supplementary information on ingredients
WELLS	Contains material of animal origin.
WASHBUF (10x)	<p>EUH208: Contains reaction mass of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1). May produce an allergic reaction.</p> <p>EUH210: Safety data sheet available on request.</p> <p>Preservatives: < 0.0015 % reaction mass of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1); < 0.1 % 5-bromo-5-nitro-1,3-dioxane</p>
DIL	<p>Contains material of animal origin.</p> <p>Preservatives: < 0.1 % sodium azide</p>
CONTROL +	<p>EUH208: Contains reaction mass of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1). May produce an allergic reaction.</p> <p>EUH210: Safety data sheet available on request.</p> <p>Preservatives: < 0.0015 % reaction mass of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1); < 0.1 % 5-bromo-5-nitro-1,3-dioxane</p>
CONTROL -	<p>Contains material of animal origin.</p> <p>Preservatives: < 0.01 % sodium azide</p>
CONJ HRP	<p>EUH210: Safety data sheet available on request.</p> <p>Contains material of animal origin.</p> <p>Preservative: < 0.01 % 5-bromo-5-nitro-1,3-dioxane</p>
SUBSTR	<p>Hazard component: 2-Pyrrolidone</p> <p>Signal word: Danger</p>  <p>H360: May damage fertility or the unborn child.</p> <p>P201: Obtain special instructions before use.</p> <p>P280: Wear protective gloves/protective clothing/eye protection/face protection.</p> <p>P308+P313: IF exposed or concerned: Get medical advice/attention.</p> <p>Restricted to professional users.</p> <p>Preservatives: < 0.00015 % reaction mass of 5-chloro-2-methyl-2H-isothiazol-3-one and 2-methyl-2H-isothiazol-3-one (3:1)</p>
STOP	-

Limitations of the Procedure

The qualitative enzyme immunological detection of *Giardia intestinalis*-specific cyst wall protein 1 (CWP 1) in stool samples does not allow correlation between the measured OD and the severity of infection. Also, it is not allowed to correlate absorbances of samples with the absorbance of the positive control. Cross contamination of reagents and samples may result in false positive results. Incorrect dilutions, insufficiently homogenized samples, and particles not sedimented by centrifugation may cause false positive as well as false negative test results. A negative test result obtained with Serazym® Giardia does not exclude an infection. False negative tests may result from improper timing of sample collection or inhomogeneous antigen distribution in the sample. The overall interpretation of the ELISA test result should consider the full clinical picture. Individual cases may require retesting at intervals of several weeks.

Stool samples that are already diluted in transport media (PARA-PAK PLUS, PARA-PAK PLUS SAF) may result in decreased OD values in Serazym® Giardia in comparison to untreated samples. In case of samples with low antigen concentrations OD values may drop below the detection limit of the test. Therefore it is recommended to use untreated samples. If untreated samples are not available, the prediluted sample should be further diluted as stated below.

Sample Treatment

Sample Collection

Collect stool sample in suitable sampling container.

Example: Stool collection tube, with spoon, screw cap, (LxØ): 107 x 25 mm, transparent

Sample Shelf Life and Storage

Stool samples should be stored at 2...8 °C immediately after collection and examined within 72 h or stored frozen at -20 °C. Repeated freezing (> 3x) and thawing of samples should be avoided due to the risk of incorrect results. Stool samples that have already been diluted in Seramun® Sample diluent A according to the instructions for use can be stored at 2...8 °C for up to 72 h and subsequently analyzed by ELISA.

Sample Preparation

Mix untreated stool samples well and dilute 1 : 6 with sample buffer.

Pipette 500 µL sample buffer into a reaction tube. For solid or semi-solid stool samples transfer 100 mg (approx. 2 - 3 mm diameter) with a disposable stick, for liquid stool samples transfer 100 µL into sample buffer and mix thoroughly. If necessary, sediment suspended particles by centrifugation in a microcentrifuge for 1 min at maximum speed.

Mix stool samples preserved in transport medium (PARA-PAK PLUS, PARA-PAK PLUS SAF) well. Pipette 250 µL dilution medium into a reaction tube. Transfer 1000 µL of the sample diluted in transport medium into sample buffer and mix thoroughly.

Reagent Treatment

Reagent Shelf Life and Storage

The complete test kit with sealed reagent bottles and microtitration strips can be stored at 2...8 °C until the printed expiration date. All opened test kit components are stable for up to 2 months when stored properly at 2...8 °C. The diluted wash buffer can be stored at 2...8 °C for up to 1 month.

Reagent Preparation

Microtiter plate with breakable 8-well strips is vacuum sealed with desiccant. Allow packaging to reach room temperature before opening. Protect unused wells from moisture and store refrigerated with desiccant in the original bag carefully resealed. Dilute wash buffer (10x) 1 : 10 with deionized water.

Example: 10 mL wash buffer (10x) + 90 mL deionized water.

Assay Procedure

1. Allow test reagents and required number of wells to reach room temperature (RT). Shake reagents gently before use. Avoid foaming.
2. Pipette 100 µL **CONTROL +** Positive control
100 µL **CONTROL -** Negative control
100 µL **diluted stool specimen** each.
3. Cover the plate and incubate for 60 min at RT.
4. Decant, then wash each well 5x with 300 µL diluted wash buffer.
Tap the plate dry on absorbent paper if necessary.
5. Add 100 µL **CONJ HRP** HRP conjugate per well.
6. Cover plate and incubate for 30 min at RT.
7. Decant, then wash each well 5x with 300 µL diluted wash buffer.
Tap the plate dry on absorbent paper if necessary.
8. Add 100 µL **SUBSTR** substrate per well.
9. Incubate for 10 min at RT **protected from light**.
10. Add 100 µL **STOP** stop solution per well, mix gently.
11. Read OD at 450 nm and ≥ 620 nm with a microplate reader within 30 min following reaction stop.

Evaluation of Results

Qualitative Evaluation:

Cut-off determination: OD negative control + 0.10

Samples showing OD values equal to or higher than the cut-off are considered positive, samples with OD values below cut-off are considered negative for *Giardia intestinalis*-specific cyst wall protein 1 (CWP 1).

The test run is valid, if:

- the mean OD value of the negative control is ≤ 0.20 (manual processing)
 ≤ 0.30 (automatic processing)
- the mean OD value of the positive control is ≥ 0.80

If the above-mentioned quality criteria are not met, test should be repeated strictly following the test procedure (incubation times and temperatures, sample and wash buffer dilution, wash steps, etc.). In case of repeated failure of the quality criteria contact the manufacturer.

Interpretation of Results

Positive	\geq cut-off
Negative	$<$ cut-off

It is recommended that each laboratory establishes its own normal and pathological reference ranges.

Performance Characteristics

Precision

To determine precision, 4 samples were measured multiple times. For the determination of the intra-assay coefficient of variation (CV), the samples were measured in an 8-fold determination in one test run. The determination of the inter-assay coefficient of variation was done by an 8-fold determination in duplicate.

Sample	Intra-assay coefficient of variation		Inter-assay coefficient of variation	
	\bar{x} OD	CV (%)	\bar{x} OD	CV (%)
1	2.182	4.89	1.947	7.4
2	1.175	3.9	1.732	8.6
3	0.563	5.1	0.760	7.7
4	0.179	3.6	0.217	9.0

Detection Limit

The lower limit of detection of Serazym® Giardia has been determined by titration of spiked stool samples spiked with 1.6×10^3 cysts, 6.3×10^4 trophozoites and 3.1 ng recombinant CWP 1 per mL stool suspension, respectively.

Sensitivity and Specificity

A collective of $n = 240$ stool samples of human origin was examined in Serazym® Giardia:

Negative: $n = 237$

Positive: $n = 3$

Specificity: 98.8 %

By direct immunofluorescence test (IFT) the 3 samples tested positive in the ELISA were confirmed as *Giardia* positive. Specificity corrected: 100 %

Giardia intestinalis positively pre-characterized stool samples of human origin were studied in Serazym® Giardia compared to two other commercial ELISA.

n = 26 stool samples of human origin	ELISA 1 positive	ELISA 1 negative
Serazym® Giardia positive	24	0
Serazym® Giardia negative	0	2

Sensitivity based on ELISA 1: 100%

n = 23 stool samples of human origin	ELISA 2 positive	ELISA 2 negative
Serazym® Giardia positive	19	2*
Serazym® Giardia negative	0	2

Sensitivity based on ELISA 2: 100 %

* Both samples, which were determined positive in Serazym® Giardia and negative in ELISA 2, were positive in both, direct IFT and ELISA 1, so they were determined as true positive.

A total of 26 *Giardia* positively pre-characterized stool samples were examined in parallel, by Serazym® Giardia and by direct immunofluorescence.

n = 26 stool samples of human origin	IFT positive	IFT negative
Serazym® Giardia positive	24	0
Serazym® Giardia negative	0	2

Sensitivity based on IFT: 100 %

Cross reactivity

Stool samples positive for one of the following pathogens did not show any cross reaction with Serazym® Giardia:

Adenovirus, astrovirus, rotavirus, *Clostridioides difficile*, *Campylobacter jejuni*, *Helicobacter pylori*, *Salmonella spp.*, *Ancylostoma duodenale*, *Ascaris lumbricoides*, *Blastocystis hominis*, *Cryptosporidium parvum*, *Entamoeba dispar/histolytica*.

Negative stool suspensions were spiked with the following microorganisms with a bacterial count of $\geq 10^8$ colony-forming units (CFU) per mL in sample buffer and tested negative in Serazym® Giardia (450 nm measurement and ≥ 620 nm reference filter < cut-off):

<i>Aeromonas hydrophila</i>	(ATCC 7966)	<i>Peptostreptococcus anaerobius</i>	(ATCC 27337)
<i>Bacillus cereus</i>	(ATCC 11778)	<i>Proteus vulgaris</i>	(ATCC 8427)
<i>Bacillus subtilis</i>	(ATCC 6633)	<i>Pseudomonas aeruginosa</i>	(ATCC 10145)
<i>Bacteroides fragilis</i>	(ATCC 25285)	<i>Salmonella enterica serovar enteritidis</i>	(ATCC 13076)
<i>Citrobacter freundii</i>	(ATCC 8090)	<i>Salmonella enterica serovar typhimurium</i>	(ATCC 14028)
<i>Clostridium sordellii</i>	(ATCC 9714)	<i>Shigella flexneri</i>	(ATCC 12022)
<i>Enterobacter aerogenes</i>	(ATCC 13048)	<i>Shigella sonnei</i>	(ATCC 25931)
<i>Enterobacter cloacae</i>	(ATCC 13047)	<i>Staphylococcus aureus</i>	(ATCC 25923)
<i>Enterococcus faecalis</i>	(ATCC 29212)	<i>Staphylococcus epidermidis</i>	(ATCC 12228)
<i>Escherichia coli</i>	(ATCC 25922)	<i>Vibrio parahaemolyticus</i>	(ATCC 17802)
<i>Klebsiella pneumoniae</i>	(ATCC 13883)		

Interference

None of the following substances in the indicated concentrations added to *Giardia intestinalis* positive and negative stool samples did show a significant impact on the test result:

Barium sulfate (5 %), Buscopan® (2 mg/mL), Cyclamate (5 %), Diclofenac (2 mg/mL), human hemoglobin (5 mg/mL), human blood (5 %), Hylak® N (5 %), Iberogast® (5 %), Imodium® acute duo (0.2/12.5 mg/mL), Loperamide (0.2 mg/mL), Metronidazole (2 mg/mL), Mucin (5 mg/mL), Nexium® (2 mg/mL), palmitic acid (20 %), Pentofuryl® (2 mg/mL), Pepto-Bismol (1 mg/mL), Perenterol (2.5 mg/mL), Rennie® (8 mg/mL), SimageI® (2 mg/mL), stearic acid (20 %), Vancomycin (2 mg/mL).

Application

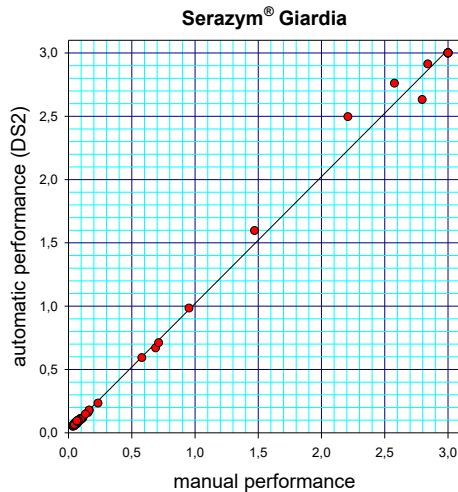
Automatic processing

The operator is responsible for the validation of the microtiter plate processors and associated application files before using this product. Application files for the use of the automated microtiter plate processors listed below may be requested from your local distributor.

Performing Serazym® Giardia on fully automated microplate processors (e.g., DS2®, DSX®; Dynex Technologies) may cause elevated absorbance values in comparison to the manual procedure caused by differences in the wash procedures and technical specifications of the equipment. In these cases, a maximum value of OD = 0.3 is permissible for the negative control. It is recommended to program a wash protocol with at least 10 s soak time per strip and wash step. A final wash step with deionized water and a soak time of 10 s is recommended after each wash cycle. If necessary, the number of wash steps may be increased to 7x or 8x.

Correlation: manual – automatic processing

A panel of 90 stool specimens was processed manually and automatically in parallel (DS2®, Dynex Technologies). The correlation coefficient was calculated at $r = 0.990$.



Examination of animal samples

Giardia spp. positively pre-characterized feces samples of animal origin (*Felis catus*, *Canis lupus familiaris*, *Phoca vitulina*, *Rattus sp.*, *Chinchilla sp.*, *Bos taurus*) were studied in Serazym® Giardia and compared to two other commercial ELISA.

n = 60 feces samples of animal origin	ELISA 1 positive	ELISA 1 negative
Serazym® Giardia positive	49	1*
Serazym® Giardia negative	3	7

Sensitivity based on ELISA 1: 94.2 %

* The sample tested positive in Serazym® Giardia and negative in ELISA 1 was positive in both, direct IFT and comparative ELISA 2.

n = 55 feces samples of animal origin	ELISA 2 positive	ELISA 2 negative
Serazym® Giardia positive	40	9**
Serazym® Giardia negative	2***	4

Sensitivity based on ELISA 2: 95.2 %

** All 9 samples tested negative in ELISA 2 and positive in Serazym® Giardia were confirmed positive in direct IFT and ELISA 1.

*** The 2 samples tested negative in Serazym® Giardia and positive in ELISA 2 were negative in both, direct IFT and comparative ELISA 1.

A total of 55 *Giardia* spp. positively pre-characterized feces samples of animal origin (*Felis catus*, *Canis lupus familiaris*, *Phoca vitulina*, *Rattus sp.*, *Chinchilla sp.*, *Bos taurus*) were examined in parallel, by Serazym® Giardia and direct IFT.

n = 55 feces samples of animal origin	IFT positive	IFT negative
Serazym® Giardia positive	48	1****
Serazym® Giardia negative	0	6

Sensitivity based on IFT: 100 %

**** The ELISA positive and IFT negative sample was tested positive in both, comparative ELISA 1 and ELISA 2.

Change History

Version	Section	Modifications
2026-03	Cover sheet	Adjustment of REF number to packaging concept
	Test Components (Delivery Scope)	Adjustment of volumes to packaging concept, addition of quantity or concentration of the active ingredient
	Additional Materials and Aids Required for the Test Procedure	Addition of "reagent container for multi-channel micropipettes"
	Important information	Table under "Safety instructions": Adjustment to the labeling on the label
	Sample Treatment	Addition of sample vessel example
	Assay Procedure	Adaptation to packaging concept
2026-04	Important information	Addition of negative control as a component across lots and products
2026-05	Application: Automatic Processing	Addition of user responsibility for the validation of microtiter plate processors