

Collagen

REF AG005K-RUO

R1 3 vials x 0.5 mg

R2 3 vials x 12 mL

FOR RESEARCH USE ONLY.
DO NOT USE IN DIAGNOSTIC PROCEDURES.

English, revision: 03-2025

INTENDED USE:

Platelet agonist for light transmission aggregometry (LTA) method for the *in vitro* quantitative determination of platelet aggregation, in human citrated plasma, using an automated or semi-automated method.

This kit is for research use only and must not be used for patient diagnosis or treatment.

SUMMARY AND EXPLANATION:

Technical :¹⁻³

Platelet function is assessed by light transmission aggregometry (LTA). LTA measures the transmission of light through a sample of platelet-rich plasma (PRP) in response to a panel of platelet agonists. Light transmittance through PRP is measured relative to a reference cuvette containing platelet poor plasma (PPP). Light transmission is set at 100% in the PPP and 0% in the PRP. When a platelet agonist is added to the stirred PRP, platelets then start to aggregate, and the light transmission of PRP increases.

PRINCIPLE:

When collagen is added to the platelet rich plasma (PRP) from a healthy subject, the platelet adhesion is initiated via the collagen receptor GPIIb/IIIa and the GPVI receptor. Following adhesion, release of the platelet granules, and production of thromboxane A₂, platelet activation occurs. Because the collagen-induced platelet aggregation mainly depends on these secondary mediators, there is a lag phase between the time when collagen is added and platelet aggregation is observed. Collagen present in vascular subendothelium plays an important role in hemostasis in vascular injury. Collagen initiates platelet adhesion and functions as a strong platelet agonist^{4,5}.

REAGENTS:

[R1] Collagen reagent: Collagen at approximately 0.5 mg (horse tendon collagen (mainly type I)), lyophilized. Contains stabilizers.

[R2] Diluent for Collagen, liquid form.

The product is classified as non-hazardous and is not subject to labeling according to EC Regulation No. 1272/2008 [CLP].

WARNINGS AND PRECAUTIONS:

- This device contains material of animal origin and should be handled as a potential carrier and transmitter of disease.
- Waste should be disposed of in accordance with applicable local regulations.
- Use only the reagents from the same batch of kits.
- To ensure optimal test results, testing the specimens and controls in succession and without interruption is recommended.

REAGENT PREPARATION:

Gently remove the freeze-drying stopper, to avoid any product loss when opening the vial.

For aggregometer:

[R1] Reconstitute the contents of each vial with **exactly 0.5 mL of distilled water** (1 mg/mL).

Shake vigorously until complete dissolution. Allow the reagent to stabilize for 30 min. at room temperature (18-25°C), shaking occasionally.

[R2] Reagent is ready to use. Allow the reagent to stabilize for 30 min. at room temperature (18-25°C).

Dilute the reconstituted Collagen as follows (example for 1 mL):

For a final conc. in the test (µg/mL)	5	2
Prepare following 10X solutions:		
"10X" Collagen concentration (µg/mL)	50	20
Collagen 1 mg/mL (µL)	50	20
Diluent for Collagen (µL)	950	980

For analyzer:

[R1] Reconstitute the contents of each vial with **exactly 0.625 mL of distilled water** (800 µg/mL).

Shake vigorously until complete dissolution. Allow the reagent to stabilize for 30 min. at room temperature (18-25°C), shaking occasionally.

[R2] Reagent is ready to use; homogenize while avoiding formation of foam and load it directly on the analyzer following Application Guide instruction.

Dilute the reconstituted Collagen as follows (example for 1 mL):

For a final conc. in the test (µg/mL)	5	2
Prepare following 8X solutions:		
"8X" Collagen concentration (µg/mL)	40	16
Collagen 800 µg/mL (µL)	50	20
Diluent for Collagen (µL)	950	980

Homogenize the reagents prior to each use.

STORAGE AND STABILITY:

Unopened reagents should be stored at 2-8°C in their original packaging. Under these conditions, they can be used until the expiry date printed on the kit.

[R1] Reagent stability after reconstitution, free from any contamination or evaporation, and stored closed, is of:

- **7 days** at 2-8°C.
- **24 hours** at room temperature (18-25°C).
- **Do not freeze.**
- **Stability on board of the analyzer: see the specific Application Guide.**

[R2] Reagent stability after opening, free from any contamination or evaporation, and stored closed, is of:

- **7 days** at 2-8°C.
- **24 hours** at room temperature (18-25°C).
- **Do not freeze.**
- **Stability on board of the analyzer: see the specific Application Guide.**

REAGENTS AND MATERIALS REQUIRED BUT NOT PROVIDED:

- Laboratory material.
- SB Cuvette (064-1041-9) and SB Set tool (063-4151-5) for CS- and CN-series.
- Automatic analyzer such as: CS-series, CN-series.
- Light transmission Aggregometer.

SPECIMEN COLLECTION AND PREPARATION:

Collection, preparation and storage of fresh samples (Platelet-rich Plasma (PRP) and Platelet-poor Plasma (PPP)) should be made according to laboratory or other validated methods.^{3,6}

The blood (9 volumes) should be carefully collected onto the trisodium citrate anticoagulant (1 volume) (0.109 mol/L, 3.2%) by clean venipuncture.

CLSI H58-A and studies^{3,6}: studies should be completed on fresh sample within a maximum of 4 h after blood collection.

PROCEDURE:

Platelet agonist should be used at 2 µg/mL. If the platelet aggregation is abnormal, higher concentration of Collagen should be tested (e.g. 5 µg/mL)^{1,3}. The Application Guides contain analyzer/assay specific handling and performance information and complement the information in these Instructions for Use.

Protocol on Aggregometer:

1. Place a stirrer in each cuvette.
2. Establish the 100% aggregation point with a cuvette containing 300 µL of PPP.
3. Pipette 285 µL of PRP into a second cuvette. Incubate at 37°C for 2 minutes. Establish the 0% aggregation point with the PRP.
4. Add 15 µL of 10X collagen solution directly to the PRP using a long and fine pipette tip. Do not inject against the walls of the cuvette.
5. Allow the aggregation profile to develop for 10 minutes.

If a reaction volume other than that specified above is required for the method used, the ratio of volumes must be strictly observed to guarantee assay performance.

QUALITY CONTROL:

Commercial controls are not available.

The control may consist of fresh sample collected from a normal donor who has not taken any antiplatelet medication and with a history of normal platelet function.

Include control samples, preferably for each test series, and at least for each new reagent batch, or after instrument maintenance.

RESULTS:

- Results are evaluated by examining the aggregation curve and the maximal aggregation (%). These parameters vary depending on instrument type, and specific normal values should be determined by each laboratory.

- Abnormal curves should be confirmed via a retest.

- Lot to lot variability measured on 3 lots is CV ≤ 10% (normal sample).

The results obtained should be for research use only and must not be used for patient diagnosis or treatment.

LIMITATIONS:

- To ensure optimum test performance and to meet the specifications, the technical instructions validated by HYPHEN BioMed should be followed carefully.
- Any reagent presenting no limpид appearance or showing signs of contamination must be rejected.
- Any suspicious samples or those showing signs of activation must be rejected.
- User defined modifications are not supported by HYPHEN BioMed as they may affect performance of the system and assay results. It is the responsibility of the user to validate modifications to these instructions or use of the reagents on analyzers other than those included in Application Guides or these Instructions for Use.
- If the number of platelets is lower than $150 \times 10^9/L$ or higher than $600 \times 10^9/L$, test results may be affected. The platelet count of PRP samples should not be adjusted to a standardized value with autologous PPP³.

PERFORMANCES:

Performances studies were conducted as described in CLSI guidelines. The following performance data represent typical results and are not to be regarded as specifications for Collagen. Mathematical analyses are performed using a validated statistical software built in accordance with CLSI guidelines. For automated assays, performances are documented in the respective Application Guides of the analyzers.

On aggregometer:

Analytical performances

Precision

Precision studies were assessed using abnormal and normal samples, on 1 series and 10 repetitions.

Sample	Repeatability	
	% Max Aggregation	CV%
Normal	85%	3.8%
Abnormal	31%	11.8%

Interfering substances

No interference was observed with the molecules and up to following concentrations:

Bilirubin C	Bilirubin F	Intralipids	Hemoglobin
30 mg/dL	30 mg/dL	360 mg/dL	250 mg/dL

On CS-series / CN-series:

Analytical performances

Precision

Precision studies were assessed using abnormal and normal samples, on 1 series and 30 repetitions.

CS-series Sample	Repeatability	
	% Max Aggregation	CV%
Normal	90%	2.8%
Abnormal	8%	16.0%
CN-series Sample	Repeatability	
	% Max Aggregation	CV%
Normal	85%	3.1%
Abnormal	27%	7.5%

Interfering substances

Interferences are defined by the analyzer system used and are documented in the respective Application Guides of the analyzers.

REFERENCES:

- Le Blanc J. et al. Advances in Platelet Function Testing-Light Transmission Aggregometry and Beyond. J Clin Med. 2020.
- Egashira M. et al. The Basic Evaluation of Light Transmission Platelet Aggregation Method on an Automated Coagulation Analyzer CN-6000. Sysmex Journal International. 2020.
- Cattaneo M. et al. Recommendations for the Standardization of Light Transmission Aggregometry: A Consensus of the Working Party from the Platelet Physiology Subcommittee of SSC/ISTH. J Thromb Haemost. 2013.
- Yardumian DA. et al. Laboratory investigation of platelet function: a review of methodology. J Clin Pathol. 1986..
- Zhou L. et al. Platelet aggregation testing in platelet-rich plasma: description of procedures with the aim to develop standards in the field. Am J Clin Pathol. 2005.
- CLSI. Platelet Function Testing by Aggregometry; Approved Guideline. CLSI document H58-A (ISBN 1-56238-683-2). CLSI, 940 West Valley Road, Suite 1400, Wayne, PA 19087 USA 2012.
- Kaeng W.L. et al. Effects of Lifestyle on Hemostasis, Fibrinolysis, and Platelet Reactivity. Arch Intern Med. 2003.
- Olas B. and Brys M. Effects of coffee, energy drinks and their components on hemostasis: The hypothetical mechanisms of their action. Food and Chemical Toxicology. 2019.

Changes compared to the previous version.

The following symbols may appear on the product labeling:

REF	Catalogue number	LOT	Batch code	RUO	Product for <i>in-vitro</i> research use, only
Rx	Numerical < x > identification of reagent		See instructions for use	WHO STD	WHO standard code
	Temperature limitation		Manufacturer		Use by
	Biological risks		Reconstitution volume	CONTENTS	Contents
Cx	Numerical < x > identification of control	i-MA	See instructions in Method Application guide	CONTAINS	Contains
EXP	Expiration date		Contains sufficient for < n > tests	UNIT	Measurement unit
TARGET VALUE	Target Value		Keep away from sunlight and heat	CALx	Numerical < x > identification of calibrator
UDI	Unique Device Identifier		Contains biological material of animal origin		Contains human blood or plasma derivatives
ACCEPTANCE RANGE	Acceptance range				