

**510(k) SUBSTANTIAL EQUIVALENCE DETERMINATION  
DECISION SUMMARY  
DEVICE ONLY TEMPLATE**

**A. 510(k) Number:**

K063323

**B. Purpose for Submission:**

Clearance of a new device

**C. Analyte:**

Plasminogen Activator Inhibitor Type-1 (PAI-1)

**D. Type of Test:**

Indirect chromogenic assay

**E. Applicant:**

American Diagnostica

**F. Proprietary and Established Names:**

Spectrolyse® PAI-1

**G. Regulatory Information:**

1. Regulation section:  
21 CFR 864.7290, Factor Deficiency Test
2. Classification:  
Class II
3. Product Code:  
GGP
4. Panel:  
81 Hematology

**H. Intended Use:**

1. Intended use(s):  
The quantitative determination of Plasminogen Activator Inhibitor Type-1 (PAI-1) activity in human plasma. The test is for *in vitro* diagnostic use and is not intended for internal use in humans and animals.
2. Indication(s) for use:
3. Special condition for use statement(s):
4. Special instrument Requirements:

**I. Device Description:**

The American Diagnostica Plasminogen Activator Inhibitor Type-1 (PAI-1) kit consists of Plasminogen Activator Reagent (PAR), tPA, tPA/PAI-1 depleted plasma, a stop reagent, and buffers. The kit contains enough reagents for 60 assays using a microwell plate (not provided).

**J. Substantial Equivalence Information:**

1. Predicate device name(s):  
BioPool Spectrolyse®/pL PAI
2. Predicate K number(s):

K922782

3. Comparison with predicate:

Similarities		
Item	Device	Predicate
Intended Use	For the quantitative determination of plasminogen activator inhibitor Type-1 (PAI-1)	Same
Sample Requirements	Citrated plasma	Same
Differences		
Item	Device	Predicate

**K. Standard/Guidance Document Referenced (if applicable):**

NCCLS/CLSI Guideline C28-A, *How to define and Determine Reference Intervals in the Clinical Laboratory*

NCCLS/CLSI EP5-A2, *Evaluation of Precision Performance of Quantitative Measurement Methods, Approved Guideline- Second Edition*

NCCLS/CLSI Guideline EP6-A, *Evaluation of the Linearity of Quantitative Measurement Procedures*

NCCLS/CLSI EP17-A, *Protocols for Determination of Limits of Detection and Limits of Quantitation*

**L. Test Principle:**

Patient plasma samples are diluted and incubated with tPA solution to allow for the tPA and PAI-1 in the sample to react. Acetate buffer is added to the sample to destroy  $\alpha$ -2-antiplasmin which would interfere with the assay. Next, the samples are incubated with a chromogenic substrate for plasmin (PAR), so that residual tPA activity in the sample catalyzes the conversion of plasminogen to plasmin, which in turn hydrolyzes the chromogenic substrate. The amount of color developed is inversely proportional to the amount of PAI-1 activity in the sample.

**M. Performance Characteristics (if/when applicable):**1. Analytical performance:a. *Precision/Reproducibility:*

Intra and inter-assay variability with 3 control samples. In Study 1, three PAI-1 controls were assayed 4 times per run for 20 total runs. In study 2, 3 PAI-1 levels were assayed 4 times per run for 5 total runs. Two lots were tested.

## Study 1 – Lot #050727 Control set 1613027

PAI (u/mL)	N	Intra - (% CV)	Inter- (% CV)
10.4	40	3.6	12.9
13.8	40	3.4	7.5
22.2	40	2.4	3.9

## Study 2 – Lot #060720 Control Set 161030

PAI (u/mL)	N	Intra - (% CV)	Inter- (% CV)
6.7	40	14.4	10.2
14.4	40	3.5	5.7
26.0	40	2.0	4.1

*b. Linearity/assay reportable range:*

Five samples of known PAI concentrations were prepared from samples of known PAI concentrations. Low (0 U/ml), mid low (10, U/ml), mid high (30 U/ml), and high (40 U/ml) samples were run using the Spectrolyse® PAI-1 assay in replicates of four. A least squares regression line was fit to the PAI-1 U/mL (Y) vs theoretical concentrations of PAI-1 samples (X) data.  $y = 0.998x + 1.1$ ,  $r = 0.998$ .

*c. Traceability (controls, calibrators, or method):*

The PAI 0 standard is calibrated against a Primary Standard according to SOP CHRO21\_A, Determining the Activity of tPA Standard.

*d. Detection limit:*

The 0 Standard and a patient sample known to have a result between 0 and 10 PAI, was assayed 20 times. Results U/mL. were analyzed according to the recommendations in NCCLS guideline EP17-A, and the LoB was calculated to be 2.6 U/mL, and the LoD was calculated to be 4.6

*e. Analytical specificity:*

Seven patient samples (untreated with antibody) were assayed in duplicated using ADI Spectrolyse® PAI-1 assay. Each patient sample was mixed with an anti-PAI antibody or with an anti-FVIII antibody negative control antibody. Results demonstrated that PAI-1 levels were essentially the same in untreated samples and samples treated with control antibody. Samples treated with anti-PAI-1 antibody had significantly reduced PAI-1 levels.

*f. Assay cut-off:*

2. Comparison studies:

*a. A. Method comparison with predicate device:*

Spectrolyse® PAI-1 method comparison studies were performed at American Diagnostica, Inc. in Stamford, CT (study1) and at Loyola University Medical Center, Chicago, IL (Study 2). Patient samples were tested using two lots of Spectrolyse® PAI-1 assay.

	N	Regression Equation	R	Syx (ng/ml)	Sample Range
Site 1	34	$y=1.0787x - 4.76$	0.953	3.31	5.3-37.8
Site 2	34	$y = 1.0179x + 3.75$	0.955	2.65	5.0-42.3

*b. Matrix comparison:*

3. Clinical studies:

*a. Clinical sensitivity:*

*b. Clinical specificity:*

*c. Other clinical supportive data (when a and b are not applicable):*

4. Clinical cut-off:

5. Expected values/Reference range:

104 Plasma samples (n=57, n=47) were assayed and analyzed according to the recommendations in NCCLS guideline C28-A.

Number of Donors	Median U/ml PAI	Mean U/ml	SD	PAI reference interval (95 percentile)
Total (104)	7	9.7	9.0	<26.7
Male (57)	9.7	11.9	9.3	<26.8
Female (47)	7.1	4.4	7.9	<26.2

**N. Conclusion:**

The submitted information in this premarket notification is complete and supports a substantial equivalence decision.

