GeneXpert
Powered By CEPHEID INNOVATION

Xpert® Factor II & Factor V

REF **GXFIIFV-10**

Instructions for Use

IVD CE

Cepheid

In Vitro Diagnostic Medical Device

301-0590, Rev. E
2024-01

Trademarks, Patents, and Copyright Statements

See Section 25 , Revision History for a description of changes.

Xpert® Factor II & Factor V

For *In Vitro* Diagnostic Use.

1 Proprietary Name

Xpert® FII & FV

2 Common or Usual Name

Xpert Factor II & Factor V

3 Intended Use

The Xpert® FII & FV test is a qualitative *in vitro* diagnostic genotyping test for the detection of Factor II and Factor V alleles from sodium citrate or EDTA anticoagulated whole blood. The test is performed on the Cepheid GeneXpert® Instrument Systems. This test is intended to provide results for Factor II (G20210A) and Factor V Leiden (G1691A) mutations as an aid in the diagnosis in individuals with suspected thrombophilia.

4 Summary and Explanation

The association of Factor II (G20210A) and Factor V Leiden (G1691A) mutations with an increased risk for venous thrombosis has been well documented.[1,2,3,4] Factor II c.*97G>A was previously designated as G20210A or 20210G>A4 and is commonly referred to as prothrombin or, as in the Xpert Factor II & Factor V test, as Factor II (G20210A). The Factor II (G20210A) mutation refers to the G to A transition at nucleotide 20210 in the 3' untranslated region of the gene and is associated with increased plasma levels of prothrombin.

Factor V c.1601G>A (p.Arg534Gln) was previously designated as G1691A or Arg506Gln and is commonly referred to as Factor V Leiden or FVL[5], or as in the Xpert Factor II & Factor V test, as Factor V (G1691A). Factor V Leiden (G1691A) refers to the G to A transition at nucleotide position 1691 of the Factor V gene, resulting in the substitution of the amino acid arginine by glutamine in the Factor V protein, causing resistance to cleavage by Activated Protein C (APC).

Factor II (G20210A) and Factor V Leiden (G1691A) mutations are present in 2% and 5% of the general population, respectively.[6]

5 Principle of the Procedure

The GeneXpert System automates and integrates sample purification, nucleic acid amplification, and detection of the target sequence in whole blood using real-time Polymerase Chain Reaction (PCR) tests. The system consists of an instrument that integrates computers and barcode scanners, and has preloaded software for running tests and viewing the results. The system requires the use of single-use disposable cartridges that hold the PCR reagents and host the PCR process. Because the cartridges are self-contained, cross-contamination between samples is eliminated. For a full description of the system, see the relevant system operator manual.

The Xpert Factor II & Factor V test includes reagents for the detection of Factor II and Factor V normal and mutant alleles from sodium citrate or EDTA anticoagulated whole blood. Each test cartridge also contains a Probe Check Control (PCC) that verifies reagent rehydration, PCR tube filling in the cartridge, probe integrity, and dye stability.

The primers and probes in the Xpert Factor II & Factor V test determine the genotype of the Factor II gene (at position 20210) and/or the Factor V gene (at position 1691).

6 Reagents

6.1 Materials Provided

The Xpert Factor II & Factor V test kit contains sufficient reagents to process 10 specimens or quality control samples.

The kit contains the following:

Xpert Factor II & Factor V test Cartridges with integrated reaction tubes	**10**
Bead 1 and Bead 2 (freeze-dried)	**1 of each per cartridge**
Reagent 1	**3.0 mL per cartridge**
Reagent 2 (Guanidinium Hydrochloride)	**3.0 mL per cartridge**
CD	**1 per kit**

- Assay Definition Files (ADF)
- Instructions to import ADF into GeneXpert software
- Instructions for Use (Package Insert)

Note Safety Data Sheets (SDS) are available at www.cepheid.com or www.cepheidinternational.com under the **SUPPORT** tab.

Note The bovine serum albumin (BSA) in the beads within this product was produced and manufactured exclusively from bovine plasma sourced in the United States. No ruminant protein or other animal protein was fed to the animals; the animals passed ante- and post-mortem testing. During processing, there was no mixing of the material with other animal materials.

7 Storage and Handling

- Store the Xpert Factor II & Factor V test cartridges at 2 – 28 °C.
- Do not use cartridges that have passed the expiration date.
- Do not open a cartridge until you are ready to perform testing.
- Use the cartridge and reagents within 30 minutes after opening the cartridge lid.

8 Materials Required but Not Provided

- GeneXpert Dx System or GeneXpert Infinity System (catalog number varies by configuration): GeneXpert instrument, computer, barcode scanner and operator manual.

Note The GeneXpert Instrument System catalog number varies by configuration. Contact Cepheid for the desired configuration and corresponding catalog number.

- GeneXpert Dx System: Software version 4.0 or higher. GeneXpert Infinity Xpertise Software version 6.6 or higher.
- Pipette to dispense 50 µL sodium citrate or EDTA anticoagulated blood with aerosol-resistant filter tips.

9 Warnings and Precautions

- Treat all biological specimens, including used cartridges, as if capable of transmitting infectious agents. Because it is often impossible to know which might be infectious, all biological specimens should be treated with standard precautions. Guidelines for specimen handling are available from the U.S. Centers for Disease Control and Prevention[7] and the Clinical and Laboratory Standards Institute[8].
- Follow your institution's safety procedures for working with chemicals and handling biological samples.
- Use the cartridges before the expiration date indicated on the kit.
- Do not open the Xpert Factor II & Factor V test cartridge lid except when adding sample.
- Do not use a cartridge that has been dropped or shaken after you have added the sample.

- Do not use a cartridge that has a damaged (e.g., bent or broken) reaction tube.
- Each single-use Xpert Factor II & Factor V test cartridge is used to process one test. Do not reuse spent cartridges.
- Biological specimens, transfer devices, and used cartridges should be considered capable of transmitting infectious agents requiring standard precautions. Follow your institution's environmental waste procedures for proper disposal of used cartridges and unused reagents. These materials may exhibit characteristics of chemical hazardous waste requiring specific national or regional disposal procedures. If national or regional regulations do not provide clear direction on proper disposal, biological specimens and used cartridges should be disposed per WHO [World Health Organization] medical waste handling and disposal guidelines.
- Store the Xpert Factor II & Factor V test kit at 2-28 °C.
- Do not open a cartridge lid until you are ready to perform testing.
- In the event the internal pressure rises in the cartridge above the pre-set manufacturer limit, the run will automatically abort and an **ERROR** result will be reported.

10 Chemical Hazards[9,10]

- UN GHS Hazard Pictogram: 
- Signal Word: WARNING
- **UN GHS Hazard Statements**
  - May be harmful if swallowed
  - Causes skin irritation
  - Causes serious eye irritation
- **UN GHS Precautionary Statements**
  - **Prevention**
    - Wash thoroughly after handling.
    - Wear protective gloves/protective clothing/eye protection/face protection
  - **Response**
    - IF ON SKIN: Wash with plenty of soap and water.
    - Specific treatment, see supplemental first aid information.
    - If skin irritation occurs: Get medical advice/attention
    - Take off contaminated clothing and wash before reuse.
    - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
    - If eye irritation persists: Get medical advice/attention
    - Call a POISON CENTER or doctor/physician if you feel unwell.

11 Specimen Collection, Transport, and Storage

To obtain adequate specimen, follow the instructions in this section closely.

- Only trained, licensed professionals should draw blood in EDTA or sodium citrate anticoagulant tubes.
- Do not centrifuge or concentrate the blood sample by plasma removal.
- Blood should be processed within 24 hours when stored at room temperature (22-28 °C). Samples should be stored at 2-8 °C if stored longer than 24 hours. Blood is stable up to 15 days when stored at 2-8 °C. The blood samples may also be stored at -20 °C or -80 °C for up to 3 months. Use of a freezer-compatible storage vial is recommended.

Note Allow frozen blood to thaw completely at room temperature. It is not recommended to freeze/thaw blood more than one time.

- Mix sample by inverting 5 times prior to dispensing into the cartridge

12 Procedure

12.1 Preparing the Cartridge

Important **Start the test within 15 minutes of adding the sample to the cartridge.**

To add the sample into the cartridge:

1. Remove the cartridge from the kit. It is not necessary to bring the cartridge to room temperature before use.
2. Mix sample by inverting the tube at least 5 times, until homogeneous.
3. Open the cartridge lid. Using a pipette with an aerosol resistant tip, transfer 50 µL of sodium citrate or EDTA anticoagulated blood to the bottom wall of the Sample opening of the Xpert Factor II & Factor V test cartridge. See Figure 1.
4. Close the cartridge lid.

Figure 1. Xpert Factor II & Factor V Cartridge

13 Running the Test

- For the GeneXpert Dx System, see Section 13.1 .
- For the GeneXpert Infinity System, see Section 13.2 .

13.1 GeneXpert Dx System

13.1.1 Selecting the Test

From the **Select Assay** drop-down menu, select the appropriate test to be run.

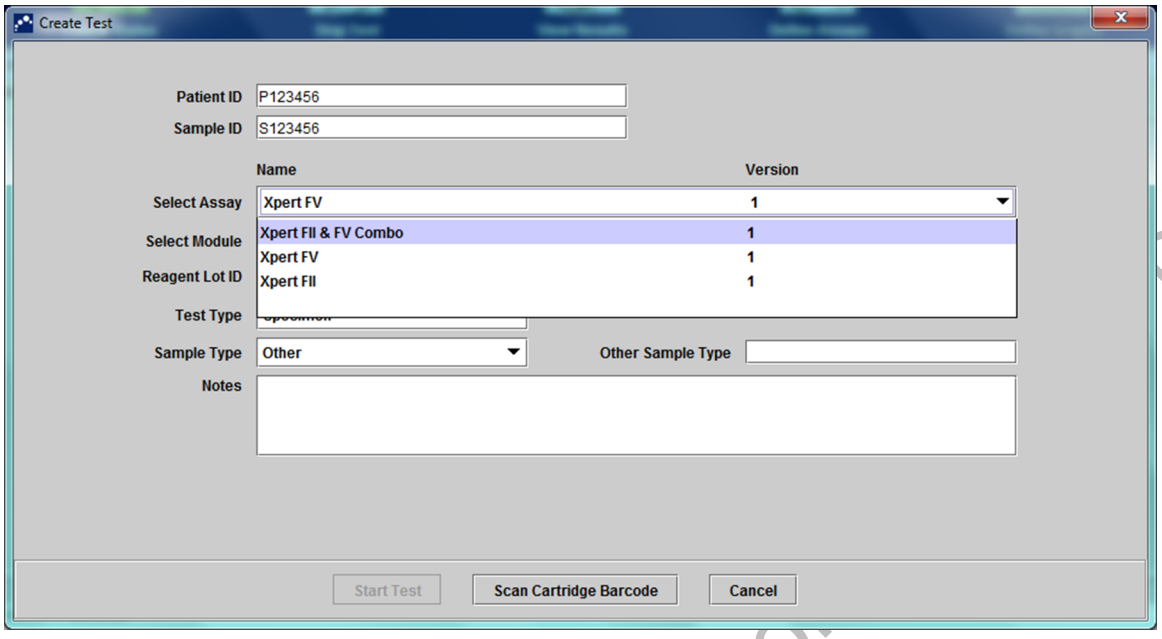

Figure 2. Create Test Window

13.1.2 Starting the Test

Before you start the test, make sure that:

Important

- The system is running the correct GeneXpert Dx software version shown in section - Materials Required but Not Provided.
- The correct assay definition file is imported into the software.

This section lists the basic steps for running the test. For detailed instructions, see the *GeneXpert Dx System Operator Manual*.

Note The steps you follow can be different if the system administrator changed the default workflow of the system.

1. Turn on the GeneXpert Dx System, then turn on the computer and log on. The GeneXpert software will launch automatically. If it does not, double-click the GeneXpert Dx software shortcut icon on the Windows® desktop.
2. Log on using your username and password.
3. In the **GeneXpert System** window, click **Create Test**.
   The **Create Test** window displays. The **Scan Patient ID barcode** dialog box displays.
4. Scan or type in the Patient ID. If typing the Patient ID, make sure the Patient ID is typed correctly.
   The Patient ID is associated with the test results and displays in the **View Results** window and all the reports. The **Scan Sample ID barcode** dialog box displays.
5. Scan or type in the Sample ID. If typing the Sample ID, make sure the Sample ID is typed correctly.
   The Sample ID is associated with the test results and displays in the **View Results** window and all the reports. The **Scan Cartridge Barcode** dialog box displays.
6. Scan the barcode on the cartridge. Using the barcode information, the software automatically fills the boxes for the following fields: Select Assay, Reagent Lot ID, Cartridge SN, and Expiration Date.

Note If the barcode on the cartridge does not scan, then repeat the test with a new cartridge. If you have scanned the cartridge barcode in the software and the assay definition file is not available, a screen displays indicating the assay definition file is not loaded on the system. If this screen displays, contact Cepheid Technical Support.

7. Click **Start Test**. In the dialog box that displays, type your password, if required.
8. Open the instrument module door with the blinking green light and load the cartridge.
9. Close the door. The test starts and the green light stops blinking.
   When the test is finished, the light turns off.
10. Wait until the system releases the door lock before opening the module door, then remove the cartridge.

11. Dispose of the used cartridges in the appropriate specimen waste containers according to your institution's standard practices.

13.1.3 Viewing and Printing Results

This section lists the basic steps for viewing and printing results. For more detailed instructions on how to view and print the results, see the *GeneXpert Dx System Operator Manual*.

1. Click the **View Results** icon to view results.
2. Upon completion of the test, click the **Report** button of the **View Results** window to view and/or generate a PDF report file.

13.2 GeneXpert Infinity System

13.2.1 Starting the Test

Important

Before you start the test, make sure that:

- The system is running the correct Xpertise software version shown in section - Materials Required but Not Provided.
- The correct assay definition file is imported into the software.

This section lists the basic steps for running the test. For detailed instructions, see the *GeneXpert Infinity System Operator Manual*.

Note The steps you follow can be different if the system administrator changed the default workflow of the system.

1. Power up the instrument. The Xpertise software will launch automatically. If it does not, double-click the Xpertise software shortcut icon on the Windows® desktop.
2. Log on to the computer, then log on to the GeneXpert Xpertise software using your user name and password.
3. In the **Xpertise Software Home** workspace, click **Orders** and in the **Orders** workspace, click **Order Test**.
   The **Order Test - Patient ID** workspace displays.
4. Scan or type in the Patient ID. If typing the Patient ID, make sure the Patient ID is typed correctly.
   The Patient ID is associated with the test results and displays in the **View Results** window and all the reports.
5. Enter any additional information required by your institution, and click the **CONTINUE** button.
   The **Order Test - Sample ID** workspace displays.
6. Scan or type in the Sample ID. If typing the Sample ID, make sure the Sample ID is typed correctly.
   The Sample ID is associated with the test results and displays in the **View Results** window and all the reports.
7. Click the **CONTINUE** button.
   The **Order Test - Assay** workspace displays.
8. Scan the barcode on the cartridge. Using the barcode information, the software automatically fills the boxes for the following fields: Select Assay, Reagent Lot ID, Cartridge SN, and Expiration Date.

Note If the barcode on the cartridge does not scan, then repeat the test with a new cartridge. If you have scanned the cartridge barcode in the software and the assay definition file is not available, a screen displays indicating the assay definition file is not loaded on the system. If this screen displays, contact Cepheid Technical Support.

   After the cartridge is scanned, the **Order Test - Test Information** workspace displays.
9. Verify that the information is correct, and click **Submit**. In the dialog box that displays, type your password, if required.
10. Place the cartridge on the conveyor belt.
    The cartridge automatically loads, the test runs, and the used cartridge are placed into the waste container.

13.2.2 Viewing and Printing Results

This section lists the basic steps for viewing and printing results. For more detailed instructions on how to view and print the results, see the *GeneXpert Infinity System Operator Manual*.

1. In the **Xpertise Software Home** workspace, click the **RESULTS** icon. The Results menu displays.

2. In the Results menu, select the **VIEW RESULTS** button. The **View Results** workspace displays showing the test results.
3. Click the **REPORT** button to view and/or generate a PDF report file.

14 Quality Control

Each test includes a probe check (PCC).

Probe check control (PCC) - Before the start of the PCR reaction, the GeneXpert Instrument System measures the fluorescence signal from the probes to monitor bead rehydration, reaction-tube filling, probe integrity and dye stability. Probe Check passes if it meets the assigned acceptance criteria.

External Controls - Normal, heterozygous, or homozygous Factor II/Factor V whole blood samples (sodium citrate or EDTA anticoagulant), or commercially available controls that have been validated with the system may be used for training, proficiency testing, and external QC of the Xpert Factor II & Factor V test. Cell-based material is required. Do not use extracted DNA. External controls may be used in accordance with local, state, and federal accrediting organizations, as applicable.

15 Interpretation of Results

The results are interpreted by the GeneXpert Instrument Systems from measured fluorescent signals and embedded algorithms to identify genotypes, and are shown in the following **View Results** windows:

The result 'NORMAL' refers to wildtype (no mutation detected); the result 'HOMOZYGOUS' refers to 'homozygous mutant' (mutation detected in both alleles); the result "HETEROZYGOUS' refers to 'heterozygous mutant' (mutation detected in one allele).

For Xpert FII results when test type FII is selected from the drop-down menu, see Figure 3 through Figure 5.

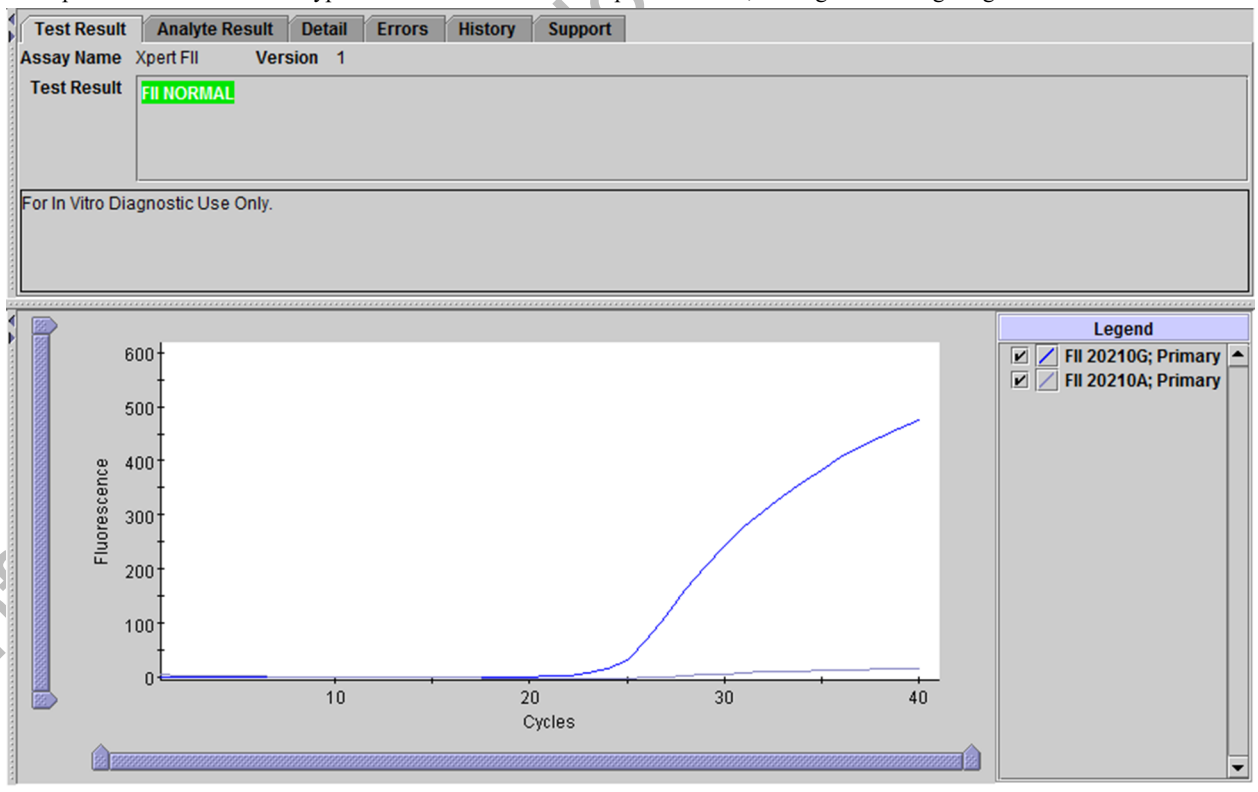

Figure 3. GeneXpert Instrument Systems - View Results Window, Factor II Normal Result

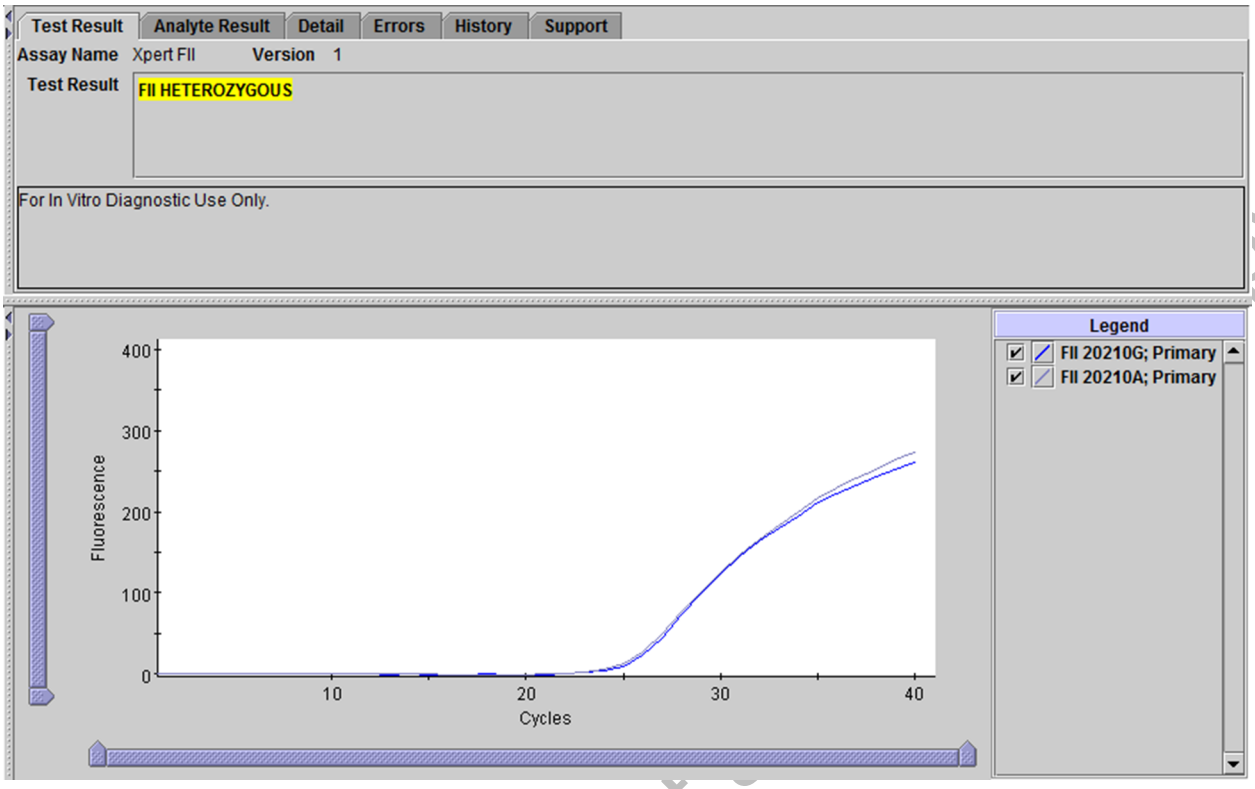

Figure 4. GeneXpert Instrument Systems—View Results window, Factor II Heterozygous Result

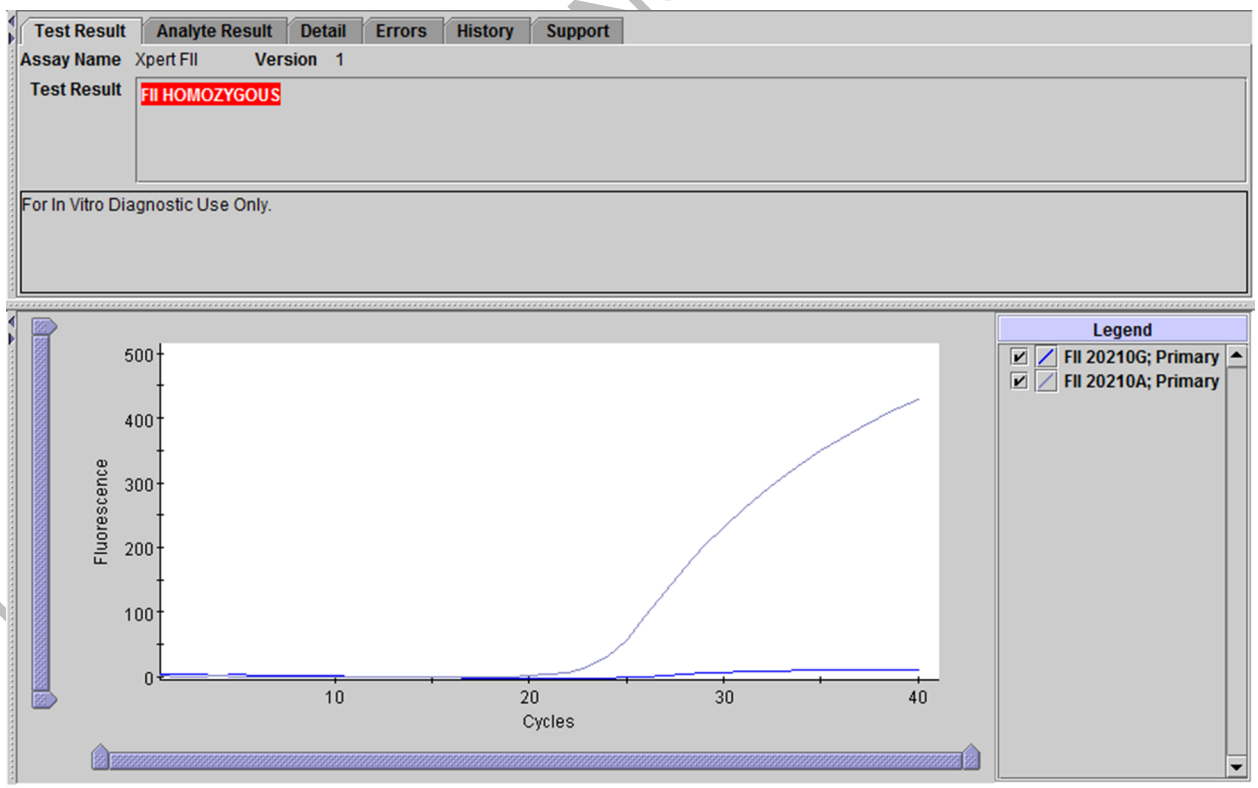

Figure 5. GeneXpert Instrument Systems—View Results Window, Factor II Homozygous result

For Xpert FV results when test type FV is selected from the drop-down menu, see Figure 6 through Figure 8.

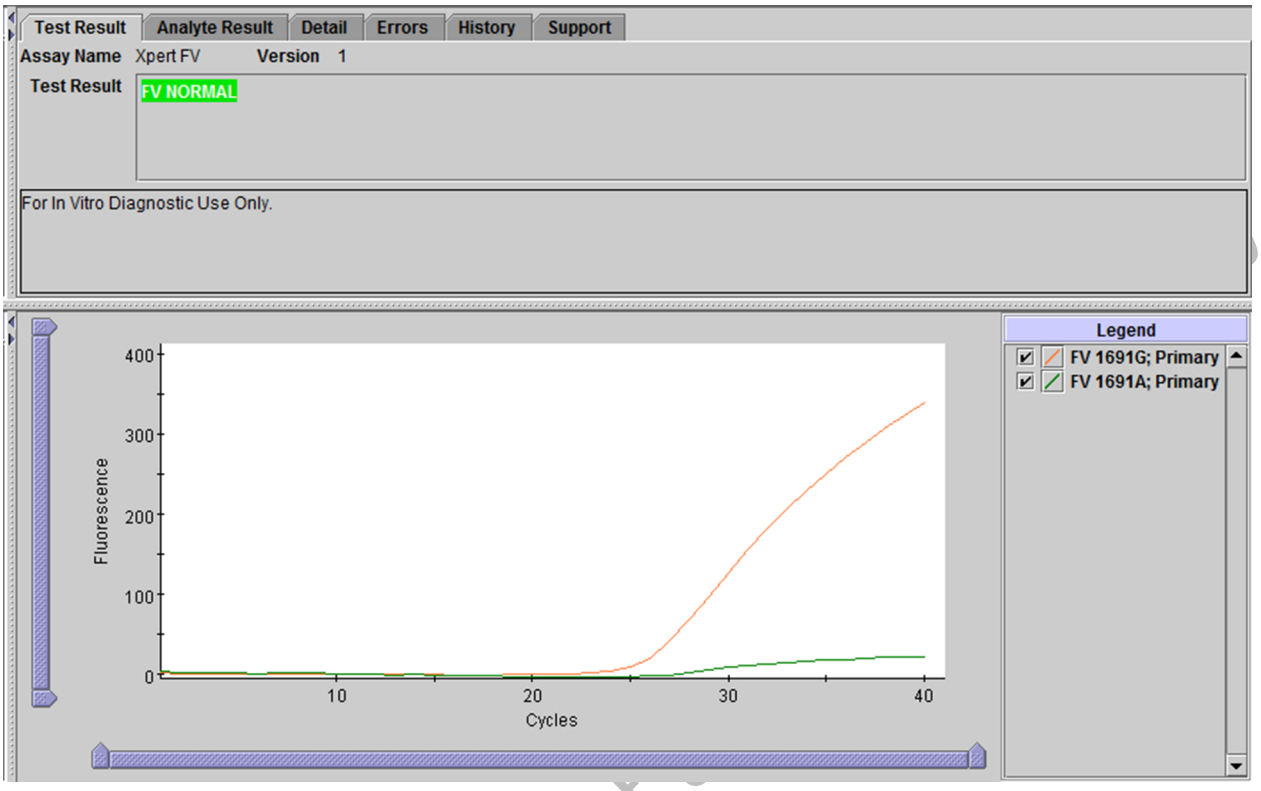

Figure 6. GeneXpert Instrument Systems—View Results Window, Factor V Normal Result

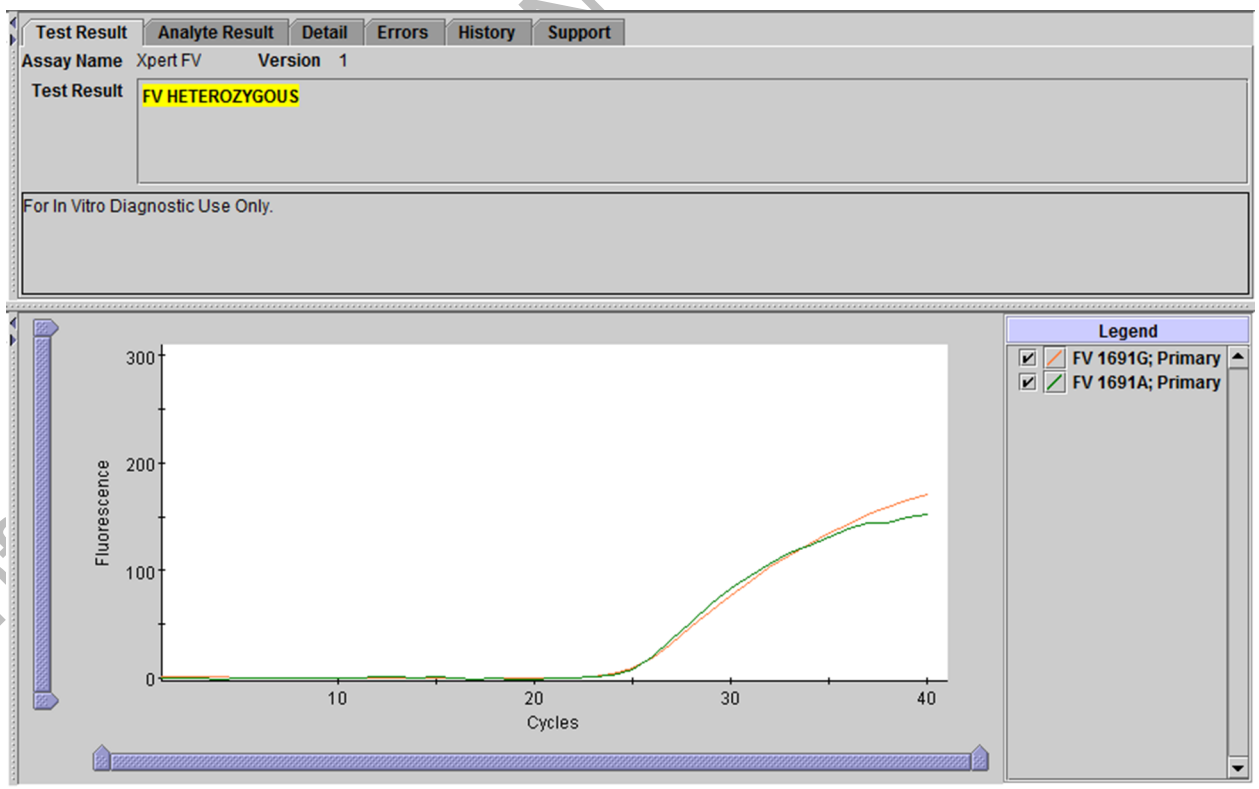

Figure 7. GeneXpert Instrument Systems—View Results Window, Factor V Heterozygous Result

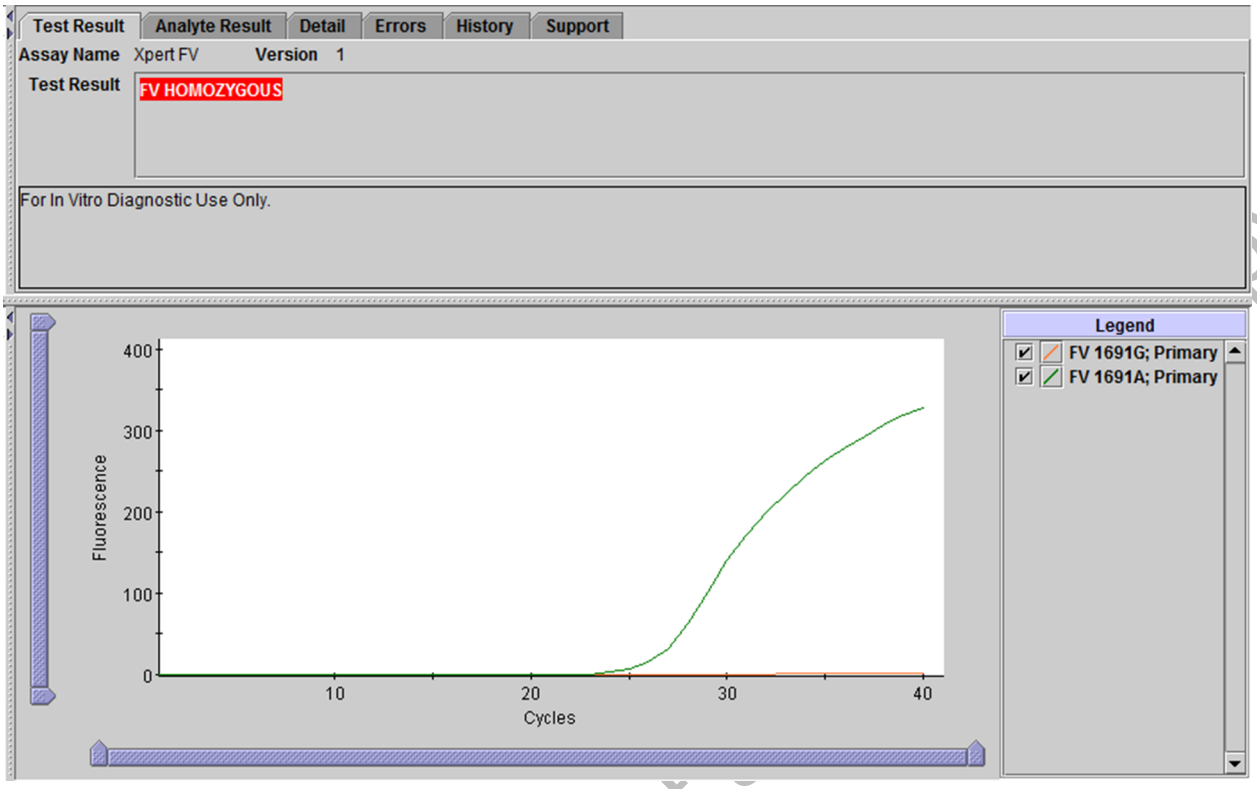

Figure 8. GeneXpert Instrument Systems—View Results Window, Factor V Homozygous Result

For Xpert FII and FV results when test type FII & FV Combo is selected from the drop-down menu, see Figure 9 through Figure 11.

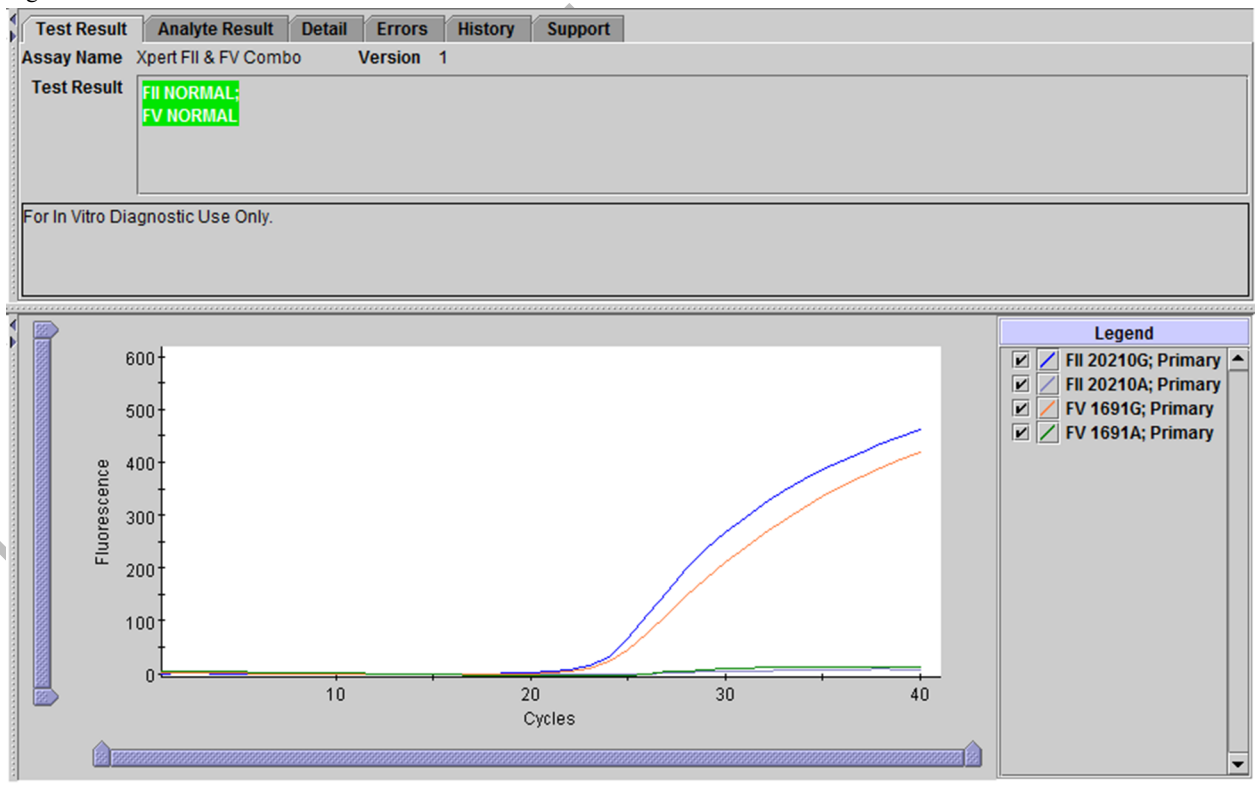

Figure 9. GeneXpert Instrument Systems—View Results Window, Factor II & Factor V Normal Result

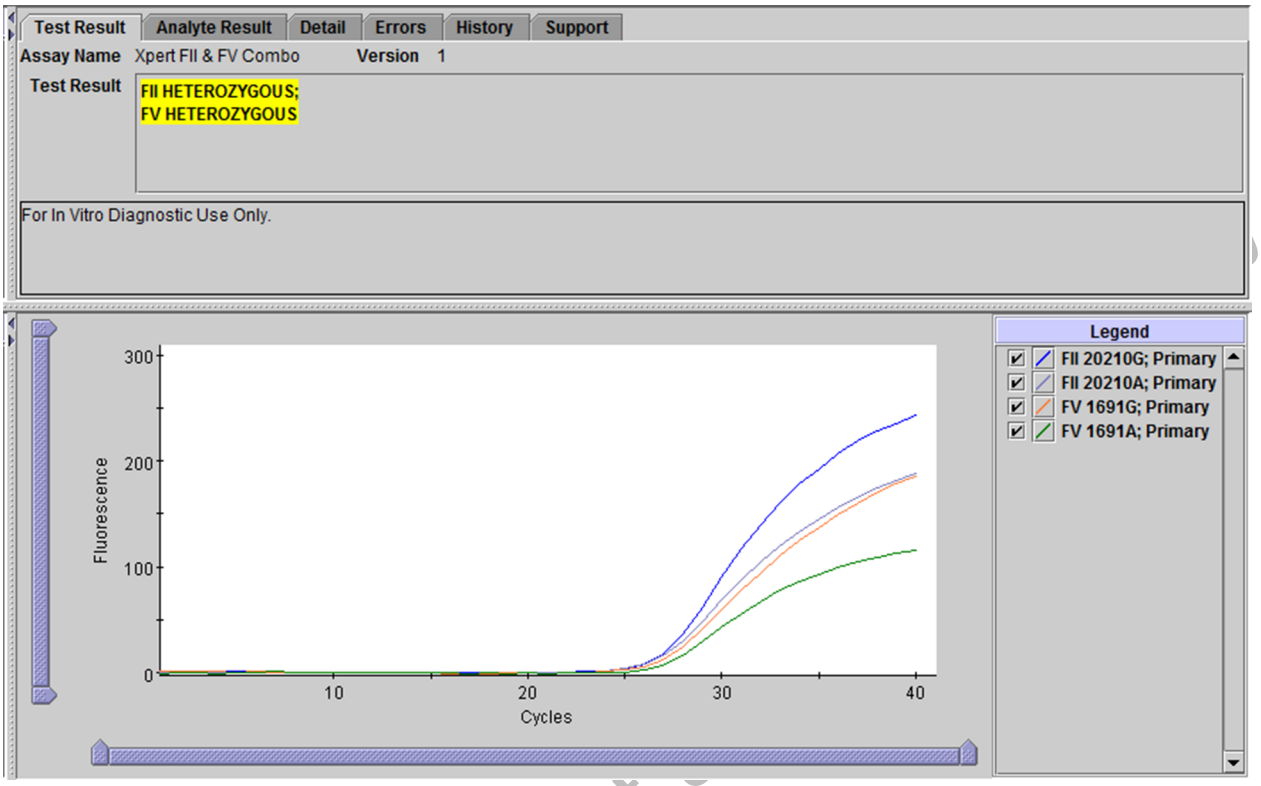

Figure 10. GeneXpert Instrument Systems—View Results Window, Factor II & Factor V Heterozygous Result

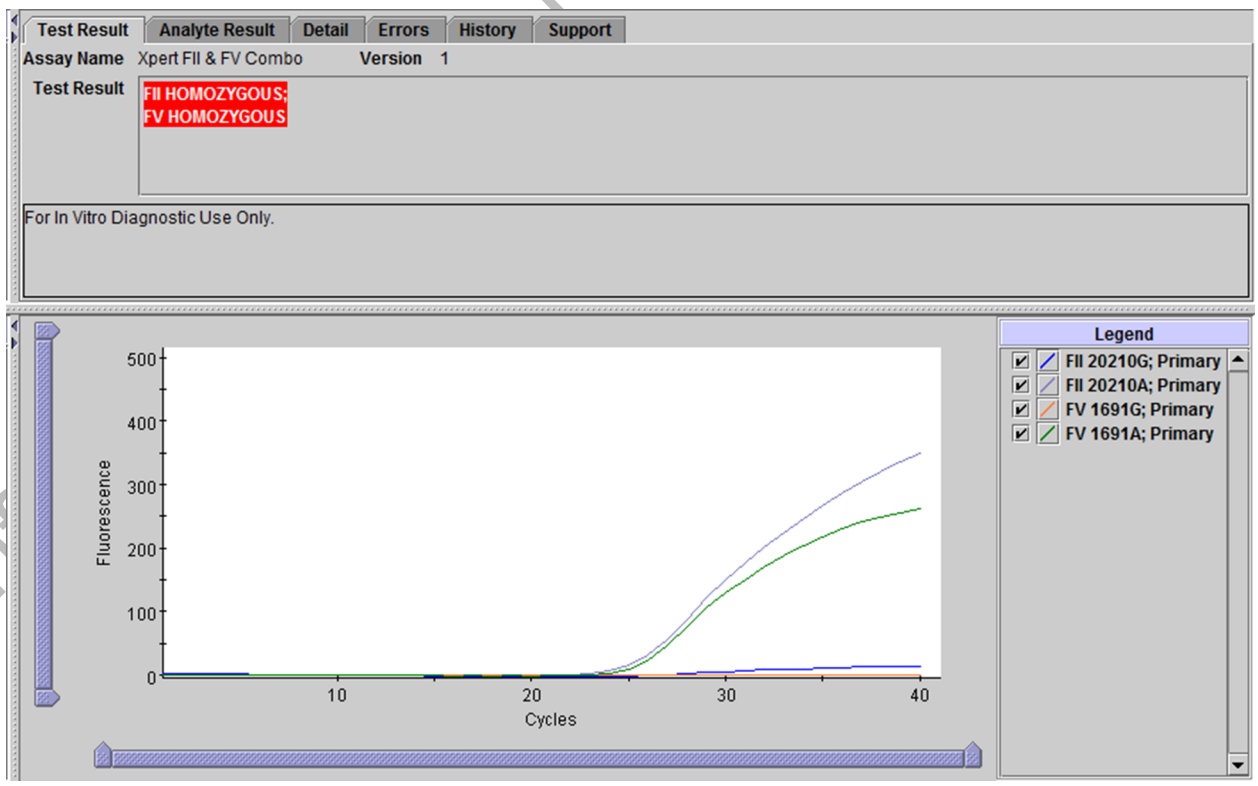

Figure 11. GeneXpert Instrument Systems—View Results Window, Factor II & Factor V Homozygous Result

INVALID

Presence or absence of Factor II/Factor V normal and mutant alleles cannot be determined; repeat test according to instructions below. The sample was not properly processed or PCR was inhibited.

- **INVALID**—Presence or absence of Factor II/Factor V normal and mutant alleles cannot be determined.
- Probe Check—PASS; all probe check results pass.

ERROR

Presence or absence of Factor II/Factor V normal and mutant alleles cannot be determined; repeat test according to instructions below. The Probe Check control failed and the test aborted possibly due to an improperly filled reaction tube, or a probe integrity problem was detected. Errors may also be caused by exceeding the maximum pressure limits or a system component failure.

- **ERROR**
- Probe Check—FAIL*; one or more of the probe check results fail.

*If the probe check passed, the error is caused by a system component failure.

NO RESULT

Presence or absence of Factor II/Factor V normal and mutant alleles cannot be determined; repeat test according to instructions below. Insufficient data were collected to produce a test result (for example, this can occur if the operator stopped a test that was in progress).

- **NO RESULT**
- Probe Check—NA (not applicable)

16 Reasons to Repeat the Test

Repeat the test using a new cartridge (do not re-use the cartridge) and a new aliquot of sodium citrate or EDTA anticoagulated whole blood:

- An **INVALID** result indicates that the sample was not properly processed or PCR was inhibited.
- An **ERROR** result indicates that the Probe Check control failed and the test was aborted possibly due to an improperly filled reaction tube, or a reagent probe integrity problem was detected. Errors may also be caused by exceeding the maximum pressure limits or a system component failure.
- A **NO RESULT** indicates that insufficient data were collected. For example, the operator stopped a test that was in progress.

17 Limitations of the Procedure

- The performance of the Xpert Factor II & Factor V test was validated using the procedures provided in this instructions for use only. Modifications to these procedures may alter the performance of the test. Results from the Xpert Factor II & Factor V test should be interpreted in conjunction with other laboratory and clinical data available to the clinician.
- Rare Factor V mutations (A1696G, G1689A, and A1692C) and any additional SNPs in the probe binding region may interfere with the target detection and yield an INVALID result.
- Other rare Factor II mutations in the probe binding region may interfere with the target detection and could yield an INVALID result, or a false HOMOZYGOUS mutant result when occurring concordantly with the Factor II c.*97G>A (G20210A) mutation.
- The performance of the Xpert Factor II & Factor V test has not been evaluated with samples from pediatric patients.
- Erroneous test results might occur from improper specimen collection, handling, or storage or sample mix-up. Careful compliance to the instructions in this package is necessary to avoid erroneous results.

18 Interfering Substances

Patients on heparin therapy and blood transfusion patients may have blood specimens that potentially interfere with the PCR results and lead to invalid or erroneous results.

Studies of potentially interfering substances showed no inhibition from up to 14.3 USP units/mL heparin, 16 mg/dL bilirubin, 250 mg/dL added cholesterol, or 1932 mg/dL total triglycerides (lipids). No inhibition was observed using whole blood samples which had gone through one freeze-thaw cycle (hemolyzed blood). No statistical significance was observed between matched specimens drawn into EDTA or sodium citrate.

19 Expected Values

Factor II (G20210A) and Factor V Leiden (G1691A) mutations are present in 2% and 5% of the general population, respectively[6].

20 Performance Characteristics

20.1 Clinical Performance

Performance characteristics of the Xpert Factor II & Factor V test were determined in a multi-site investigational study at seven institutions by comparing the Xpert Factor II & Factor V test with bi-directional sequencing.

Specimens included those whose routine care called for collection of whole blood for Factor II and/or Factor V testing. Samples were first tested by routine methods used in each participating laboratory and then aliquots collected for study testing by the Xpert Factor II & Factor V test on the GeneXpert. Excess DNA was sent to a contract laboratory for bi-directional sequencing.

Performance of the Xpert Factor II & Factor V test was calculated relative to bi-directional sequencing results.

Xpert Factor II & Factor V Test

A total of 1018 samples were tested for Factor II by both the Xpert Factor II & Factor V test and bi-directional sequencing. A total of 1014 samples were tested for Factor V by both the Xpert Factor II & Factor V test and bi-directional sequencing. To supplement the homozygous sample size, six human genomic DNA samples homozygous for Factor II and five homozygous for Factor V were also tested by the Xpert Factor II & Factor V test and bi-directional sequencing. The results are presented in Table 1.

The Xpert Factor II & Factor V test demonstrated a 99.3% overall accuracy relative to bi-directional sequencing for both Factor II and Factor V.

Table 1. Xpert Factor II & Factor V Test Performance vs. Bi-directional Sequencing

Genotype	Number Tested	Number of Correct Calls on First Run	Number of Invalid[a] Calls on First Run	Agreement on First Run	Number of Correct Calls Including Repeat Run	Number of Invalid Calls on Repeat Run	Agreement After Repeat Run
Factor II G20210A							
WT[b]	968	927	41	95.8%	963	5	99.5%
HET	50	48	2	96.0%	48	2	96.0%
HOM	7	7	0	100.0%	7	0	100%
Overall	1025[c]	982	43	95.8%	1018	7	99.3%
Factor V G1691A							
WT	895	860	35	96.1%	889	6	99.3%
HET	114	108	6	94.7%	113	1	99.1%
HOM	12	11	1	91.7%	12	0	100.0%

Genotype	Number Tested	Number of Correct Calls on First Run	Number of Invalid[a] Calls on First Run	Agreement on First Run	Number of Correct Calls Including Repeat Run	Number of Invalid Calls on Repeat Run	Agreement After Repeat Run
Overall	1021[d]	979	42	95.9%	1014	7	99.3%

[a] No discordant results. Invalid results refer to “indeterminate” results

[b] WT (wildtype) is normal

[c] Bi-directional sequencing results for Factor II were not available for 4 specimens

[d] Bi-directional sequencing results for Factor V were not available for 8 specimens

20.2 Analytical Performance

20.2.1 Analytical Specificity

To evaluate the analytical specificity of the Xpert Factor II & Factor V test, normal gene sequences containing silent single nucleotide polymorphisms (SNPs) in the probe binding region as well as outside the probe binding region were synthesized. The presence of the additional SNP in the probe binding region, in most cases, resulted in an invalid result. When a valid result was obtained, it gave the correct genotype.

The presence of an additional SNP outside the probe binding region resulted in the correct genotyping call.

20.2.2 Analytical Sensitivity

Studies were performed to determine the minimum and maximum amount of input patient specimen for both EDTA and sodium citrate anticoagulated whole blood needed to obtain a correct genotype, such that the lower bound of the 95% confidence interval for the estimated “correct call” fraction is greater than 95%.

EDTA and sodium citrate anticoagulated blood samples were tested (n=20) at 8 volumes varying from 5 µL to 250 µL.

Although the test can tolerate varying volumes from 15 µL - 100 µL, 50 µL is the recommended sample volume to minimize the risk of errors associated with limited and excess sample.

20.2.3 Reproducibility

A panel of 5 specimens, consisting of one of each specimen type listed below, was tested in duplicate by two different operators on 5 different days at each of three sites (3 specimens x 2 times/day x 2 operators per site x 5 days x 3 sites). One lot of XpertFactor II & Factor V test kit was used at each of the 3 testing sites. Xpert Factor II & Factor V tests were performed according to the Xpert Factor II & Factor V procedure. Results are summarized in Table 2 through Table 5.

Study panel:

1. a sample with normal (wildtype) alleles for both Factor II & Factor V;
2. a sample heterozygous for Factor II mutation (i.e., one mutant and one wildtype allele for Factor II gene) and with normal (wildtype) alleles for Factor V;
3. a sample homozygous for Factor II mutation (i.e., two mutant alleles for Factor II gene) and with normal (wildtype) alleles for Factor V;
4. a sample with normal (wildtype) alleles for Factor II and homozygous for Factor V mutation (i.e., two mutant alleles for Factor V gene);
5. a sample with normal (wildtype) alleles for Factor II and heterozygous for Factor V mutation (i.e., one mutant and one wildtype allele for Factor V gene).

A summary of the results by site is shown in Table 2 and Table 3. There was no statistically significant difference in results among sites for either Factor II (p=1.000) or Factor V (p=1.000).

Table 2. Summary of Reproducibility Results by Site - Factor II

Specimen ID	Site 1	Site 2	Site 3	% Total Agreement by Sample
NOR	100% (20/20)	100% (20/20)	100% (20/20)	100% (60/60)
Factor II HET/Factor V NOR	100% (20/20)	100% (20/20)	100% (20/20)	100% (60/60)
Factor II HOM/Factor V NOR	100% (20/20)	100% (20/20)	100% (20/20)	100% (60/60)
Factor II NOR/Factor V HOM	100% (20/20)	100% (20/20)	100% (20/20)	100% (60/60)
Factor II NOR/Factor V HET	100% (20/20)	100% (20/20)	95.0% (19/20)[a]	98.3% (59/60)[a]
% Total Agreement by Site	100% (60/60)	100% (60/60)	98.3% (59/60)[a]	99.7% (299/300)[a]

[a] No discordant results. One sample was indeterminate after retest.

Table 3. Summary of Reproducibility Results by Site - Factor V

Specimen ID	Site 1	Site 2	Site 3	% Total Agreement by Sample
NOR	100% (20/20)	100% (20/20)	100% (20/20)	100% (60/60)
Factor II HET/Factor V NOR	100% (20/20)	100% (20/20)	100% (20/20)	100% (60/60)
Factor II HOM/Factor V NOR	100% (20/20)	100% (20/20)	100% (20/20)	100% (60/60)
Factor II NOR/Factor V HOM	100% (20/20)	100% (20/20)	100% (20/20)	100% (60/60)
Factor II NOR/Factor V HET	100% (20/20)	100% (20/20)	95.0% (19/20)[a]	98.3% (59/60)[a]
% Total Agreement by Site	100% (60/60)	100% (60/60)	98.3% (59/60)[a]	99.7% (299/300)[a]

[a] No discordant results. One sample was indeterminate after retest.

A summary of the results by operator is shown in Table 4 and Table 5. There was no statistically significant difference in results among sites for either Factor II (p=1.000) or Factor V (p=1.000).

Table 4. Summary of Reproducibility Results by Operator - Factor II

Specimen ID	Site 1		Site 2		Site 3		% Total Agreement by Sample
	Op 1	Op 2	Op 1	Op 2	Op 1	Op 2	
NOR	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (60/60)
Factor II HET/Factor V NOR	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (60/60)
Factor II HOM/Factor V NOR	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (60/60)
Factor II NOR/Factor V HOM	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (60/60)
Factor II NOR/ Factor V HET	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	90.0% (9/10)[a]	98.3% (59/60)[a]

% Total Agreement by Operator	100% (50/50)	100% (50/50)	100% (50/50)	100% (50/50)	100% (50/50)	98.0% (49/50)[a]	99.7% (299/300)[a]

[a] No discordant results. One sample was indeterminate after retest.

Table 5. Summary of Reproducibility Results by Operator - Factor V

Specimen ID	Site 1		Site 2		Site 3		% Total Agreement by Sample
	Op 1	Op 2	Op 1	Op 2	Op 1	Op 2	
NOR	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (60/60)
Factor II HET/Factor V NOR	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (60/60)
Factor II HOM/Factor V NOR	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (60/60)
Factor II NOR/Factor V HOM	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (60/60)
Factor II NOR/ Factor V HET	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	100% (10/10)	90.0% (9/10)[a]	98.3% (59/60)[a]
% Total Agreement by Operator	100% (50/50)	100% (50/50)	100% (50/50)	100% (50/50)	100% (50/50)	98.0% (49/50)[a]	99.7% (299/300)[a]

[a] No discordant results. One sample was indeterminate after retest.

To assess the between lot reproducibility, the 5-specimen panel described above was analyzed two times per day over 5 testing days using each of three test lots at a single testing site (5 specimens x 2 runs per day x 3 lots x 5 days). A summary of the results by lot is shown in Table 6 and Table 7. There was no statistically significant difference in results between lots for either Factor II (p=1.000) or Factor V (p=1.000).

Table 6. Summary of Reproducibility Results by Lot - Factor II

Specimen ID	Lot 1	Lot 2	Lot 3	% Total Agreement by Sample
NOR	100% (10/10)	100% (10/10)	100% (10/10)	100% (30/30)
Factor II HET/Factor V NOR	100% (10/10)	100% (10/10)	100% (10/10)	100% (30/30)
Factor II HOM/Factor V NOR	100% (10/10)	100% (10/10)	100% (10/10)	100% (30/30)
Factor II NOR/Factor V HOM	100% (10/10)	100% (10/10)	100% (10/10)	100% (30/30)
Factor II NOR/Factor V HET	100% (10/10)	100% (10/10)	100% (10/10)	100% (30/30)
% Total Agreement by Lot	100% (50/50)	100% (50/50)	100% (50/50)	100% (150/150)

Table 7. Summary of Reproducibility Results by Lot - Factor V

Specimen ID	Lot 1	Lot 2	Lot 3	% Total Agreement by Sample
NOR	100% (10/10)	100% (10/10)	100% (10/10)	100% (30/30)
Factor II HET/Factor V NOR	100% (10/10)	100% (10/10)	100% (10/10)	100% (30/30)
Factor II HOM/Factor V NOR	100% (10/10)	100% (10/10)	100% (10/10)	100% (30/30)
Factor II NOR/Factor V HOM	100% (10/10)	100% (10/10)	100% (10/10)	100% (30/30)
Factor II NOR/Factor V HET	100% (10/10)	100% (10/10)	100% (10/10)	100% (30/30)
% Total Agreement by Lot	100% (50/50)	100% (50/50)	100% (50/50)	100% (150/150)

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22 Cepheid Headquarters Locations

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23 Technical Assistance

Before contacting Cepheid Technical Support, collect the following information:

- Product name
- Lot number
- Serial number
- Error messages (if any)
- Software version and, if applicable, Computer Service Tag number

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Email: techsupport@cepheid.com

France Technical Support

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Contact information for all Cepheid Technical Support offices is available on our website: www.cepheid.com/en/support/contact-us.

24 Table of Symbols

Symbol	Meaning
REF	Catalog number
IVD	*In vitro* diagnostic medical device
	Do not reuse

Symbol	Meaning
	Batch code
	Consult instructions for use
	Caution
	Manufacturer
	Country of manufacture
	Contains sufficient for *n* tests
	Control
	Expiration date
	CE marking – European Conformity
	Authorized Representative in the European Community
	Temperature limitation
	Biological risks
	Authorized Representative in Switzerland
	Importer

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25 Revision History

Description of Changes: 301-0590, Rev. D to Rev. E

Section	Description of Change
Throughout	Added GeneXpert Infinity System.
5	Removed "handheld" from barcode scanner.
8	Removed bullet point HemosIL FII & FV DNA Control, P/N 0020003500.
13	Separated procedures for GeneXpert Dx System and GeneXpert Infinity System.
14	Updated external controls.
25	Added Revision History section.