

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

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

k143687

**B. Purpose for Submission:**

New Device

**C. Measurand:**

Calibration verification materials for ADVIA Centaur FSH, FT4, T4, and T3 assay

**D. Type of Test:**

Not Applicable

**E. Applicant:**

Siemens Healthcare Diagnostics Inc.

**F. Proprietary and Established Names:**

ADVIA Centaur Follicle Stimulating Hormone (FSH) Master Curve Material  
ADVIA Centaur FT4 Master Curve Material  
ADVIA Centaur T4 Master Curve Material  
ADVIA Centaur T3 Master Curve Material

**G. Regulatory Information:**

1. Regulation section:

21CFR § 862.1660, Quality Control Material (assayed and unassayed)

2. Classification:

Class I, Reserved

3. Product code:

JJX

4. Panel:

Clinical Chemistry (75)

**H. Intended Use:**

1. Intended use(s):

See indications for use below.

2. Indication(s) for use:

The ADVIA Centaur® Follicle Stimulating Hormone (FSH) Master Curve Material is for in vitro diagnostic use in the verification of calibration and reportable range of the ADVIA Centaur FSH assay.

The ADVIA Centaur® Free Thyroxine (FT4) Master Curve Material is for in vitro diagnostic use in the verification of calibration and reportable range of the ADVIA Centaur FT4 assay.

The ADVIA Centaur® Thyroxine (T4) Master Curve Material is for in vitro diagnostic use in the verification of calibration and reportable range of the ADVIA Centaur T4 assay.

The ADVIA Centaur® Triiodothyronine (T3) Master Curve Material is for in vitro diagnostic use in the verification of calibration and reportable range of the ADVIA Centaur T3 assay.

3. Special conditions for use statement(s):

For prescription use only

4. Special instrument requirements:

ADVIA Centaur Systems

**I. Device Description:**

The ADVIA Centaur FSH Master Curve Material consists of one set of eight levels (MCM1-8), with a reconstituted volume of 1.0 mL/vial per level. MCM1 contains no analyte. MCM2-8 contains various levels of follicle stimulating hormone spiked in lyophilized equine serum with sodium azide (0.1% after reconstitution) and preservatives. The MCMs assigned values are lot-specific of target values: 0.00, 1.50, 4.50, 12.0, 30.0, 62.5, 130, and 225 mIU/mL.

The ADVIA Centaur FT4 Master Curve Material consists of one set of seven levels (MCM1-7), with a reconstituted volume of 1.0 mL/vial per level. MCM1 contains no analyte. MCM2-

7 contains various levels of thyroxine spiked in human plasma with sodium azide (0.1% after reconstitution) and preservatives. The MCMs assigned values are lot-specific of target values: 0.00, 0.42, 0.80, 1.70, 3.0, 5.6, and 13.5 ng/dL.

The ADVIA Centaur T4 Master Curve Material consists of one set of six levels (MCM1-6), with a reconstituted volume of 1.0 mL/vial per level. MCM1 contains no analyte. MCM2-6 contains various levels of levothyroxine spiked in human plasma with sodium azide (0.1% after reconstitution) and preservatives. The MCMs assigned values are lot-specific of target values: 0.00, 2.50, 5.00, 10.0, 15.0, and 35.0 µg/dL.

The ADVIA Centaur T3 Master Curve Material consists of one set of seven levels (MCM1-7), with a reconstituted volume of 1.0 mL/vial per level. MCM1 contains no analyte. MCM2-7 contains various levels of liothyronine spiked in human plasma with sodium azide (0.1% after reconstitution) and preservatives. The MCMs assigned values are lot-specific of target values: 0.00, 0.42, 0.69, 1.11, 1.65, 3.87, and 7.00 ng/mL.

The sponsor has the following caution statement in their labeling: “While each human serum or plasma donor unit used in the manufacture of this product was tested by FDA-approved methods and found nonreactive for hepatitis B surface antigen (HBsAg), antibody to hepatitis C (HCV), and antibody to HIV-1/2, all products manufactured using human source material should be handled as potentially infectious. Because no test method can offer complete assurance that hepatitis B or C viruses, HIV, or other infectious agents are absent, these products should be handled according to established good laboratory practices.”

#### **J. Substantial Equivalence Information:**

1. Predicate device name(s):

- IMMULITE 2000 FSH Calibration Verification Material (CVM)
- IMMULITE 2000 FT4 Calibration Verification Material (CVM)
- Elecsys T4 Calcheck 5
- Elecsys T3 Calcheck 5

2. Predicate 510(k) number(s):

- k133124
- k140818
- k112528
- k111552

3. Comparison with predicate:

ADVIA Centaur FSH Master Curve Material:

<b>Similarities</b>		
Item	Candidate Device ADVIA Centaur FSH MCM	Predicate Device IMMULITE 2000 FSH CVM (k133124)
Intended Use	For in vitro diagnostic use in the verification of calibration and reportable range of the ADVIA Centaur FSH assay	Same
Analyte	Follicle stimulating hormone	Same
Matrix	Equine serum	Bovine serum

<b>Differences</b>		
Item	Candidate Device ADVIA Centaur FSH MCM	IMMULITE 2000 FSH CVM (k133124)
Use	Multiple use	Single use
Form	Lyophilized	Liquid
Storage	2-8°C	≤-20°C
Levels	8	4
Stability	Unopened – Stable when stored unopened at 2-8°C for 6 months Opened (reconstituted) – Stable when stored at 2-8°C for 28 days; or on-board for 4 hours.	Unopened – Stored at ≤-20°C until the expiration date

ADVIA Centaur FT4 Master Curve Material:

<b>Similarities</b>		
Item	Candidate Device ADVIA Centaur FT4 MCM	Predicate Device IMMULITE 2000 FT4 CVM (k140818)
Intended Use	For in vitro diagnostic use in the verification of calibration and reportable range of the ADVIA Centaur FT4 assay.	Same
Analyte	Free Thyroxine	Same
Form	Lyophilized	Same
Matrix	Human Plasma	Human serum

<b>Differences</b>		
Item	Candidate Device ADVIA Centaur FT4 MCM	Predicate Device IMMULITE 2000 FT4 CVM (k140818)
Use	Multiple use	Single use
Storage	2-8°C	≤-20°C
Levels	7	4
Stability	Unopened – Stable when stored unopened at 2-8°C for 6 months Opened (reconstituted) – Stable when stored at 2-8°C for 14 days; or on-board for 4 hours	Unopened – Stored at ≤ -20°C until the expiration date Opened (reconstituted) – Stable for 8 hours at 15-25°C

ADVIA Centaur T4 Master Curve Material:

<b>Similarities</b>		
Item	Candidate Device ADVIA Centaur T4 MCM	Predicate Device Elecsys T4 Calcheck 5 (k112528)
Intended Use	For in vitro diagnostic use in the verification of calibration and reportable range of the ADVIA Centaur T4 assay.	Same
Analyte	Thyroxine	Same
Form	Lyophilized	Same
Matrix	Human Plasma	Human serum
Storage	2-8°C	Same

<b>Differences</b>		
Item	Candidate Device ADVIA Centaur T4 MCM	Predicate Device Elecsys T4 Calcheck 5 (k112528)
Levels	6	5
Stability	Unopened – Stable when stored unopened at 2-8°C for 10 months	Unopened – Stored at 2-8°C until the expiration date printed on the bottle Opened (reconstituted) – Stable for 4 hours at 20-25°C
Use	Single use	Multiple use

ADVIA Centaur T3 Master Curve Material:

<b>Similarities</b>		
Item	Candidate Device ADVIA Centaur T3 MCM	Predicate Device Elecsys T3 Calcheck 5 (k111552)
Intended Use	For in vitro diagnostic use in the verification of calibration and reportable range of the ADVIA Centaur T3 assay.	Same
Analyte	Triiodothyronine	Same
Form	Lyophilized	Same
Matrix	Human Plasma	Human serum
Use	Multiple Use	Same
Storage	2-8°C	Same

<b>Differences</b>		
Item	Candidate Device ADVIA Centaur T3 MCM	Predicate Device Elecsys T3 Calcheck 5 (k111552)
Levels	7	5
Stability	Unopened – Stable when stored unopened at 2-8°C for 10 months Opened (Reconstituted) – Stable when stored at 2-8°C for 21 days; or on-board for 4 hours.	Unopened – Stored at 2-8°C until the expiration date Opened (reconstituted) – Stable for 4 hours at 20-25°C

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

- Guidance for Industry – Abbreviated 510(k) Submissions for In Vitro Diagnostic Calibrators
- Guidance for Industry and FDA Staff – Assayed and Unassayed Quality Control Material

**L. Test Principle:**

Not applicable

**M. Performance Characteristics (if/when applicable):**

1. Analytical performance:

a. *Precision/Reproducibility:*

Not applicable

b. *Linearity/assay reportable range:*

Not applicable

c. *Traceability, Stability, Expected values (controls, calibrators, or methods):*

Value Assignment

Value assignment for the ADVIA Centaur FSH MCM was based on using assigned reference calibrators and MCMs. The assigned reference calibrators were prepared using follicle-stimulating hormone stock and are traceable to internal material, which is standardized against World Health Organization (WHO) 2<sup>nd</sup> International Standard for human FSH (IS94/632) reference material. The MCMs are manufactured using qualified materials and measurement procedures. MCM1 was run in 5 replicates on two separate runs using one reagent lot kit on one ADVIA Centaur system. MCM2-8 were tested on 20 replicates (comprised of 1 run with 4 sample cups run in 5 replicates) on 1 ADVIA Centaur system, using 1 reagent kit lot. The lot-specific assigned ranges are the lot-specific customer ranges established per the sponsor's internal procedural specifications for FSH MCM. MCM1 is assigned a 0.0 dose. MCM8 targeted greater than the assay range is diluted with MCM1 to meet the reportable range of the assay. The target values and target ranges for the customer are provided in the ADVIA Centaur FSH Master Curve Material lot-specific value card.

<b>MCM Level</b>	<b>Target Values (mIU/mL)</b>
MCM1	0.00
MCM2	1.50
MCM3	4.50
MCM4	12.0
MCM5	30.0
MCM6	62.5
MCM7	130
MCM8	225
Assay Range	0.3-200 mIU/mL

Value assignment for the ADVIA Centaur FT4 MCM was based on using assigned reference calibrators and MCMs. The assigned reference calibrators were prepared using United States Pharmacopeia (USP) T4 stock and are traceable to USP internal material. The MCMs are manufactured using qualified materials and measurement procedures. MCM1 was run in 5 replicates on two separate runs using one reagent lot kit on one ADVIA Centaur system. MCM2-7 were tested on 20 replicates (comprised

of 1 runs with 4 sample cups run with 5 replicates per run) on 1 ADVIA Centaur system, using 1 reagent kit lot. The lot-specific assigned ranges are the lot-specific customer ranges established per the sponsor's internal procedural specifications for FT4 MCM. MCM1 is assigned a 0.0 dose. MCM7 targeted greater than the assay range is diluted with MCM1 to meet the reportable range of the assay. The target values and target ranges for the customer are provided in the ADVIA Centaur FT4 Master Curve Material lot-specific value card.

<b>MCM Level</b>	<b>Target Values (ng/dL)</b>
MCM1	0.00
MCM2	0.42
MCM3	0.80
MCM4	1.70
MCM5	3.0
MCM6	5.6
MCM7	13.5
Assay Range	0.1-12.0 ng/dL

Value assignment for the ADVIA Centaur T4 MCM was based on using assigned reference calibrators and MCMs. The assigned reference calibrators were prepared using United States Pharmacopeia (USP) T4 stock and are traceable to USP internal material. The MCMs are manufactured using qualified materials and measurement procedures. MCM1 was run in 5 replicates on two separate runs using one reagent lot kit on one ADVIA Centaur system. MCM2-6 were tested on 20 replicates (comprised of 1 runs with 4 sample cups run with 5 replicates per run) on 1 ADVIA Centaur system, using 1 reagent kit lot. The lot-specific assigned ranges are the lot-specific customer ranges established per the sponsor's internal procedural specifications for FT4 MCM. MCM1 is assigned a 0.0 dose. MCM6 targeted greater than the assay range is diluted with MCM1 to meet the reportable range of the assay. The target values and target ranges for the customer are provided in the ADVIA Centaur T4 Master Curve Material lot-specific value card.

<b>MCM Level</b>	<b>Target Values (µg/dL)</b>
MCM1	0.00
MCM2	2.50
MCM3	5.00
MCM4	10.0
MCM5	15.0
MCM6	35.0
Assay Range	0.3-30.0 µg/dL

Value assignment for the ADVIA Centaur T3 MCM was based on using assigned reference calibrators and MCMs. The assigned reference calibrators were prepared using United States Pharmacopeia (USP) T3 stock and are traceable to USP internal

material. The MCMs are manufactured using qualified materials and measurement procedures. MCM1 was run in 5 replicates on two separate runs using one reagent lot kit on one ADVIA Centaur system. MCM2-7 were tested on 20 replicates (comprised of 1 runs with 4 sample cups run with 5 replicates per run) on 1 ADVIA Centaur system, using 1 reagent kit lot. The lot-specific assigned ranges are the lot-specific customer ranges established per the sponsor's internal procedural specifications for FT4 MCM. MCM1 is assigned a 0.0 dose. The target values and target ranges for the customer are provided in the ADVIA Centaur T4 Master Curve Material lot-specific value card.

<b>MCM Level</b>	<b>Target Values (ng/mL)</b>
MCM1	0.00
MCM2	0.42
MCM3	0.69
MCM4	1.11
MCM5	1.65
MCM6	3.87
MCM7	7.00
Assay Range	0.1-8ng/mL

### Stability

Shelf-life and open vial stability testing protocols and acceptance criteria for the ADVIA Centaur FSH MCM were described and found to be adequate. The real time stability study results support the shelf life claim of 6 months when stored unopened at 2-8°C. Open vial (reconstituted) stability studies support the sponsor's open vial claim of 28 days when properly stored at 2-8°C, or on board the ADVIA Centaur system for 4 hours at room temperature.

Shelf-life and open Vial Stability testing protocols and acceptance criteria for the ADVIA Centaur FT4 MCM were described and found to be adequate. The real time stability study results support the shelf life claim of 6 months when stored unopened at 2-8°C. Open vial (reconstituted) stability studies support the sponsor's open vial claim of 14 days when properly stored at 2-8°C, or on board the ADVIA Centaur system for 4 hours at room temperature.

Shelf-life stability testing protocols and acceptance criteria for the ADVIA Centaur T4 MCM were described and found to be adequate. The real time stability study results support the shelf life claim of 10 months when stored unopened at 2-8°C. There is no open vial claim for the T4 MCM because materials are intended to be used only once when opened.

Shelf-life and open vial stability testing protocols and acceptance criteria for the ADVIA Centaur T3 MCM were described and found to be adequate. The real time stability study results support the shelf life claim of 10 months when stored unopened

at 2-8°C. Open vial (reconstituted) stability studies support the sponsor's open vial claim of 21 days when properly stored at 2-8°C, or on board the ADVIA Centaur system for 4 hours at room temperature.

*d. Detection limit:*

Not applicable

*e. Analytical specificity:*

Not applicable

*f. Assay cut-off:*

Not applicable

2. Comparison studies:

*a. Method comparison with predicate device:*

Not applicable

*b. Matrix comparison:*

Not applicable

3. Clinical studies:

*a. Clinical Sensitivity:*

Not applicable

*b. Clinical specificity:*

Not applicable

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

Not applicable

4. Clinical cut-off:

Not applicable

5. Expected values/Reference range:

Not applicable.

**N. Proposed Labeling:**

The labeling is sufficient and it satisfies the requirements of 21 CFR Part 809.10.

**O. Conclusion:**

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