

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

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

k082612

**B. Purpose for Submission:**

To obtain substantial equivalence determination for a new assay.

**C. Measurand:**

*S. agalactiae* specific ribosomal RNA sequences

**D. Type of Test:**

Fluorescence In Situ Hybridization (FISH) using protein nucleic acid (PNA) probes

**E. Applicant:**

AdvanDx, Inc

**F. Proprietary and Established Names:**

GBS PNA FISH®

**G. Regulatory Information:**

1. Regulation section:

21 CFR 866.3740

2. Classification:

Class I

3. Product code:

OAH

4. Panel:

83 Microbiology

## H. Intended Use:

1. Intended use(s):

GBS PNA FISH® is a qualitative nucleic acid hybridization assay intended for the detection of *Streptococcus agalactiae* from turbid Lim broth cultures obtained from vaginal and rectal swabs of pregnant women between 35 and 37 weeks gestation.

2. Indication(s) for use:

The GBS PNA FISH® does not provide susceptibility results. Culture isolates are needed for performing susceptibility testing as recommended for penicillin-allergic women. Subculture to a solid media for additional testing.

The GBS PNA FISH® Assay is used as an aid in the detection of *Streptococcus agalactiae* from turbid Lim broth cultures.

3. Special conditions for use statement(s):

Prescription Use Only

4. Special instrument requirements:

Not Applicable

## I. Device Description:

PNA FISH® is performed directly on smears fixed onto microscope slides. Hybridization is performed at 55°C for 90 min. The coverslip is removed and a post-hybridization wash at 55°C for 30 min. with a stringent wash solution to remove unbound PNA probe. The smear is finally mounted with Mounting Medium for examination with fluorescence microscopy (Dual Band Filter). While maintaining the morphology of the cells, presumptive *S. agalactiae* cells show green fluorescence by binding of the fluorophore-labeled PNA probes. Results are read by fluorescence microscopy using a dual band filter.

GBS PNA FISH® is provided in a kit box with the following kit components:

Fixation Solution

GBS PNA

Wash Solution

Mounting Medium

## J. Substantial Equivalence Information:

1. Predicate device name(s):

*S. aureus* PNA FISH

2. Predicate K number(s):

k060099

3. Comparison with predicate:

<b>Similarities</b>		
<b>Item</b>	<b>Device</b>	<b>Predicate</b>
Intended use	Identification of Group B <i>Streptococcus</i> ( <i>S. agalactiae</i> )	Identification of <i>S. aureus</i>
Technology	Fluorescence <i>in situ</i> hybridization using PNA probes	same
Controls	Positive and Negative control	same
Interpretation of Results	Qualitative fluorescence microscope	same
Kit components	Fixation Solution PNA probes 60X Wash Solution Mounting medium Package insert	same

<b>Differences</b>		
<b>Item</b>	<b>Device</b>	<b>Predicate</b>
Sample type	Lim Broth cultures	Positive Blood cultures
Time to Result	1.5 hours	2.5 hours
PNA Probes	<i>S. agalactiae</i> PNA	<i>S. aureus</i> PNA

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

Not applicable

**L. Test Principle:**

The PNA FISH technology uses species-specific peptide nucleic acid (PNA) probes in a fluorescence in situ hybridization format.

A mixture of a fluorescein-labeled, *S. agalactiae* specific PNA probe is added to a

smear prepared from Lim broth cultures. Hybridization is performed at 55°C for 30 minutes. The hybridization is followed by a post-hybridization wash at 55°C for 30 min with a stringent Wash Solution to remove unbound PNA probe. Finally, the smear is mounted with Mounting Medium and examined by fluorescence microscopy.

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

1. Analytical performance:

a. *Precision/Reproducibility:*

A reproducibility study was performed using ten study slides with positive and negative controls. The study was performed at three different sites including one in-house over three separate days by one operator per site. This is a qualitative assay and only positive or negative results are possible.

b. *Linearity/assay reportable range:*

Not applicable

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

Quality control (QC) strains of *S. agalactiae* ATCC 13813 (Positive control), and *S. pyogenes* ATCC 12384 (Negative control) were tested at three sites each day of test. The QC study was performed a sufficient number of times to demonstrate that it can produce acceptable quality control results.

d. *Detection limit:*

The detection limit for *S. agalactiae* was determined to be approximately  $10^5$  colony-forming units per mL (CFU/mL) by serial dilutions of positive cultures.

e. *Analytical specificity:*

GBS PNA FISH® has been tested on 44 laboratory and reference strains including *Streptococcus agalactiae* and other Gram-positive cocci in pairs or chains (GPCPC). Seven out of the eight *S. agalactiae* strains tested positive. *S. agalactiae* ATCC 51487 gave a borderline signal which may have been due to its unusual growth requirements. All (36/36) other species appearing as GPCPC tested negative. In addition, 44 strains representing 18 fungal species and 17 other bacterial species, including some common species of vaginal flora were tested. All strains (44/44) tested negative by GBS PNA FISH®.

f. *Assay cut-off:*

Not applicable

2. Comparison studies:

a. *Method comparison with predicate device:*

The performance of GBS PNA FISH® was evaluated on 636 Lim broth cultures of prenatal screening swabs at three clinical trial sites in the United States. Results were compared with PCR and with growth on a blood agar plate then confirmed with agglutination assays.

<b>Study</b>	<b>Positive Agreement</b>	<b>Negative Agreement</b>
<b>A-1</b>	98.0% (48/49)	86.8% (164/189)
	95% CI (89.2-100)	95% CI (81.1-91.3)
<b>A-2</b>	98.4% (61/62)	93.2% (164/176)
	95% CI (91.3-100)	95% CI (88.4-96.4)
<b>B</b>	89.2% (33/37)	98.1% (157/160)
	95% CI (74.6-97.0)	95% CI (94.6-99.6)
<b>C-1</b>	98.4% (63/64)	100% (137/137)
	95% CI (91.6-100)	95% CI (97.8-100)
<b>C-2</b>	100% (62/62)	99.3% (138/139)
	95% CI (95.3-100)	95% CI (96.1-100)

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:

*S. agalactiae* is identified as multiple bright green fluorescent cocci in multiple fields of view. Other species appear non-fluorescent.

**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.