

***GBS antenatal
Screening cultures
Specimen processing
DEVANI protocol***

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Use of selective enrichment broth

- To maximize the isolation of GBS
- To avoid overgrowth of other organisms

Nb women, medium	Direct culture 48hrs GBS+	Sub- culture from SEB % GBS+	Authors
200, Granada	88 %	100 %	Tazi A et al, 2008
500, Granada	72 %	99 %	Melin P et al, 2008
StrepB select	74 %	96 %	
288, Blood /Lim	52 %	82 %	Shibuya R, 2009
New Granada	52 %	100 %	

**Why a selective enrichment broth, a Granada agar and both Vaginal/rectal swabs
(% of positive cultures/Total of positive cultures)**

GBS + specimen	Primo-culture		Sub-culture	
	GS-CNA	Granada	GS-CNA	Granada
V alone	11,8	11,1	24,5	17,4
R alone	24,5	25	20,4	20,6
V+R	61,7	63,9	55,1	61,9
% POS	51,5	54,5	74,2	95,5

Which selective enrichment broth?

- **Todd Hewitt broth**
+ colistin + nalidixic acid

= LIM broth

(potential overgrowth of enterococci)

- **Todd Hewitt broth**
+ gentamicin + nalidixic acid (+ 5% sheep blood)
(C.Baker, 1973 Applied Microbiology)

= « Trans-Vag™ broth »

- **Granada biphasic broth**

Evolution of culture methods

Revised guidelines from CDC (2002)

- **Sub-culture < selective enrichment broth**
 - **Blood agar with/without CNA**
 - **Advantage**
 - Growth of all GBS Isolates beta-hemolytic or not
 - **Disadvantage**
 - Difficulty in seeing rare GBS colonies within mixed flora
 - Difficulty in recognizing non-hemolytic GBS in mixed flora

Granada (BD) - StreptoB ID - StrepB Select versus Blood agar +/- CNA

500 genital swabs (29.4 % GBS Positive)

	Number of GBS Positive culture (%)		
	Direct culture	Lim sub-culture	Total
Strep B Select (BioRad)	103 (70.1)	134 (91.1)	139 (94,6)*
« Granada » (BD)	90 (61.2)	123 (83.7)	124 (84.4)
Strep B ID (bioMérieux)	93 (63.2)	124 (84.3)	128 (87.1)
BA ± CNA	76 (51.7)	113 (76.9)	120 (80.6)
>=1 Medium			147 (100)

* StrepB Select > BA (p<0,5)

Granada (BD) - StreptoB ID - StrepB Select *versus* Blood agar +/- CNA

« False-Positive »

= Characteristic colonies not confirmed as GBS

	Identified as
Strep B Select	GAS, GCS, GDS-enterococci, Staphylococci, <i>S.bovis</i> , α -hemolytic colonies, (yeasts, Gram negative bacilli)
Granada	/
Strep B ID	GCS, Staphylococci, α -hemolytic colonies, (Gram negative bacilli)
BA +/- CNA	GAS, GCS, GFS, Staphylococci, GDS-enterococci, (Gram negative bacilli)

Positive predictive value Granada (BD) - StreptoB ID - StrepB Select versus Blood agar +/- CNA

	PPV Primoculture	PPV Lim sub-culture
Strep B Select	71,5 %	77,9 %
Granada	100 %	100 %
Strep B ID	80,9 %	87,9 %
BA +/- CNA	62,8 %	65,7 %

Sensitivity

Strep B Select > Granada - Strep B ID > CNA

Specificity

Granada > Strep B ID > Strep B Select > CNA

Which agar or which combination?

+/- Blood agar



Workload – costs – extra-testing to be considered

Standard procedure



Vagino-rectal swab or
Vaginal & rectal swabs



Inoculate swab(s) in 1 Lim broth

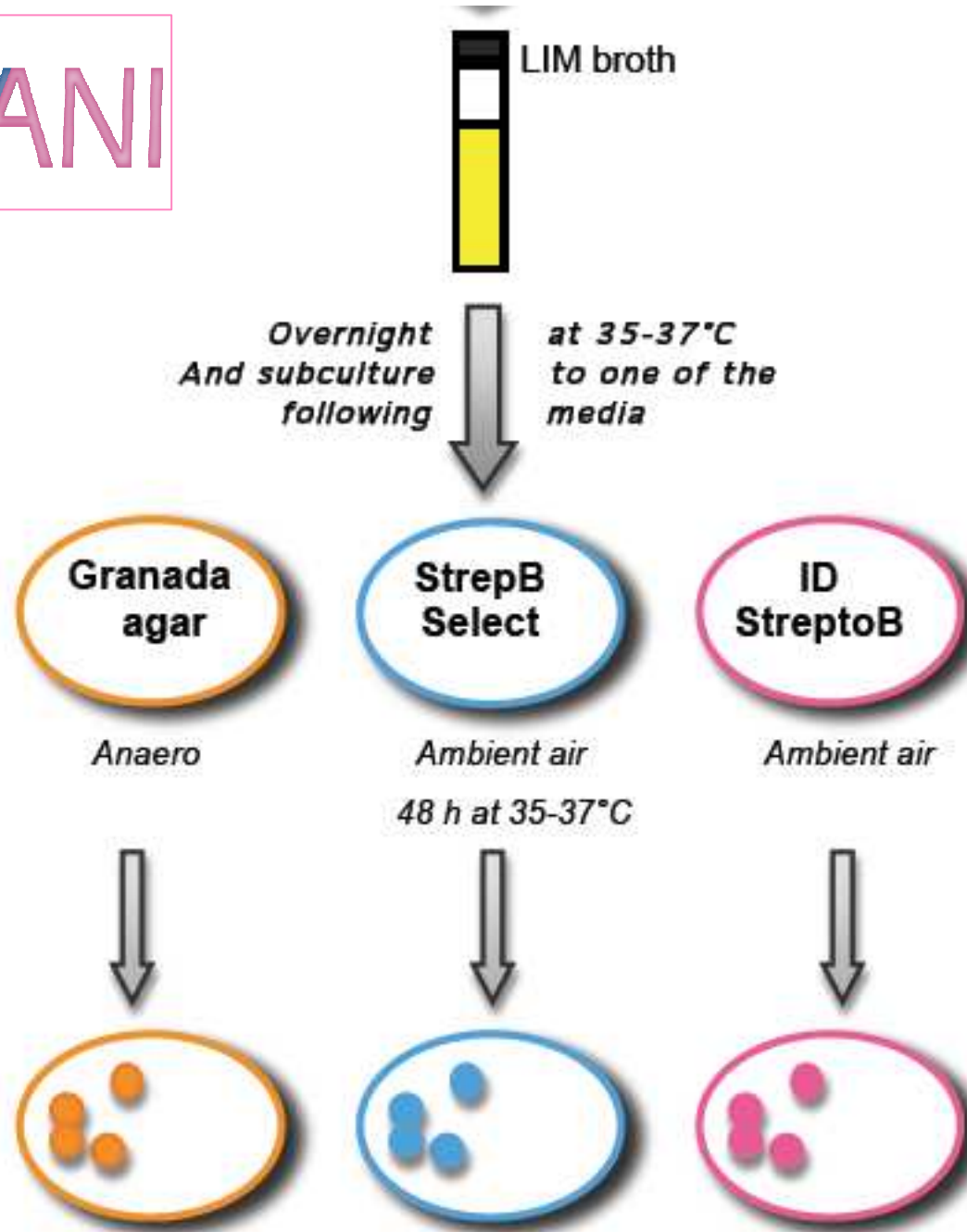


LIM broth

*Overnight
And subculture
following*



*at 35-37°C
to one of the
media*



Optional procedure



Vagino-rectal swab or
Vaginal & rectal swabs



*Inoculate swab and streak to at least
one of the following media*



*18 h at 35-37°C in appropriate
atmosphere*

And



LIM broth

Overnight



at 35-37°C

**If no GBS identified on direct
plate(s) :
proceed as in standard
procedure.**



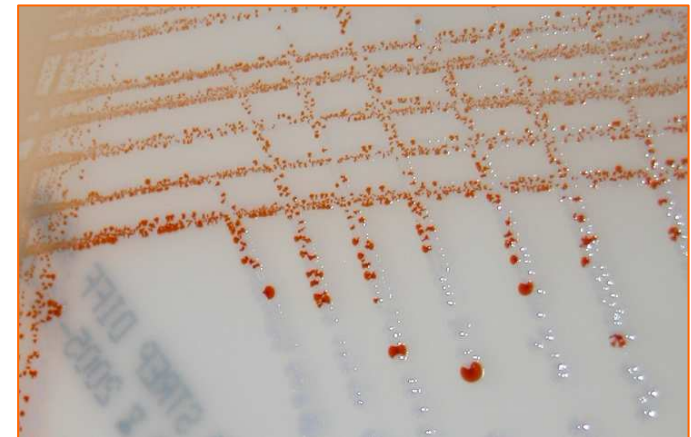
Reading and processing of the cultures



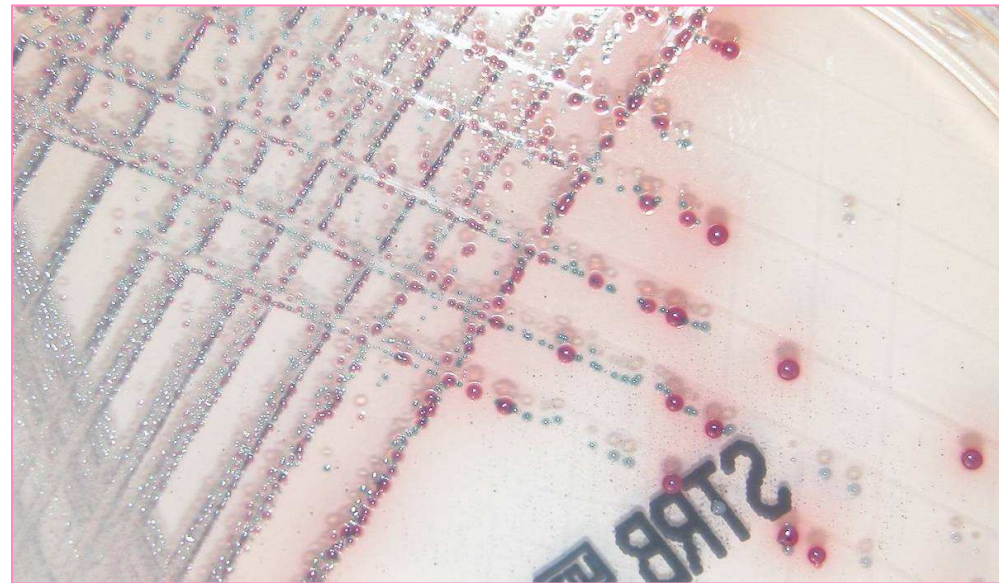
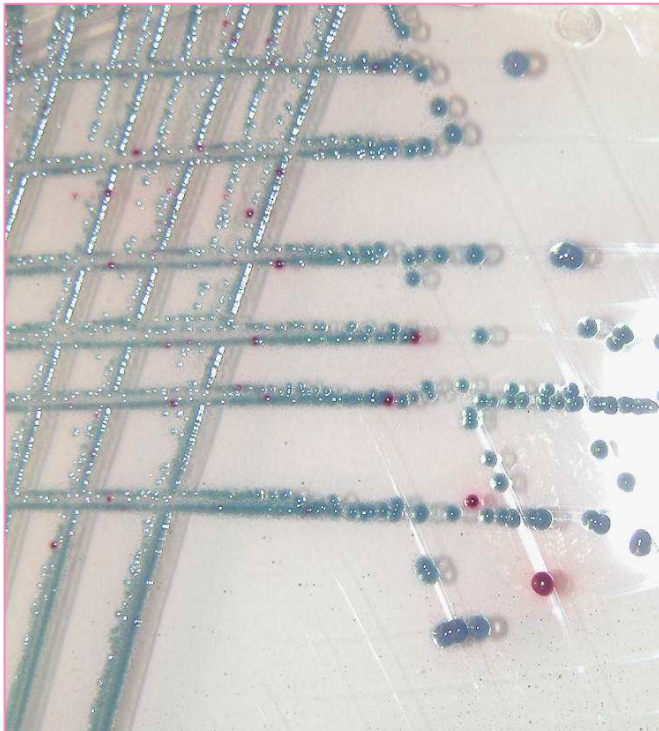
Granada medium agar

Orange color: GBS pigment, Granadaene

100% specific for GBS // β -hemolysis



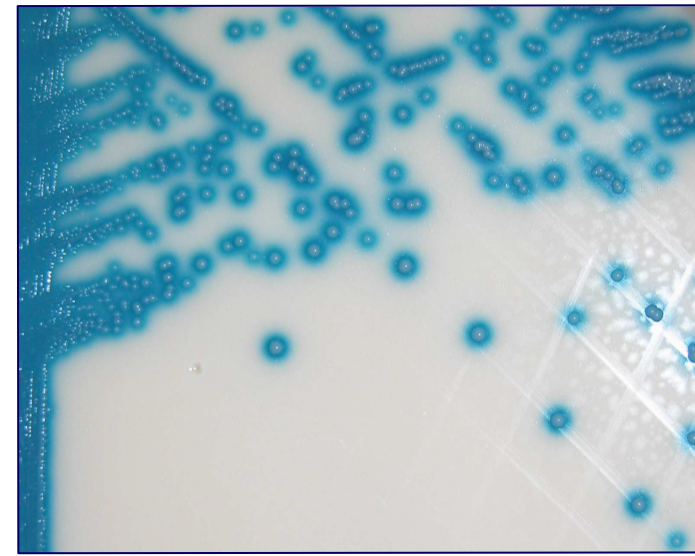
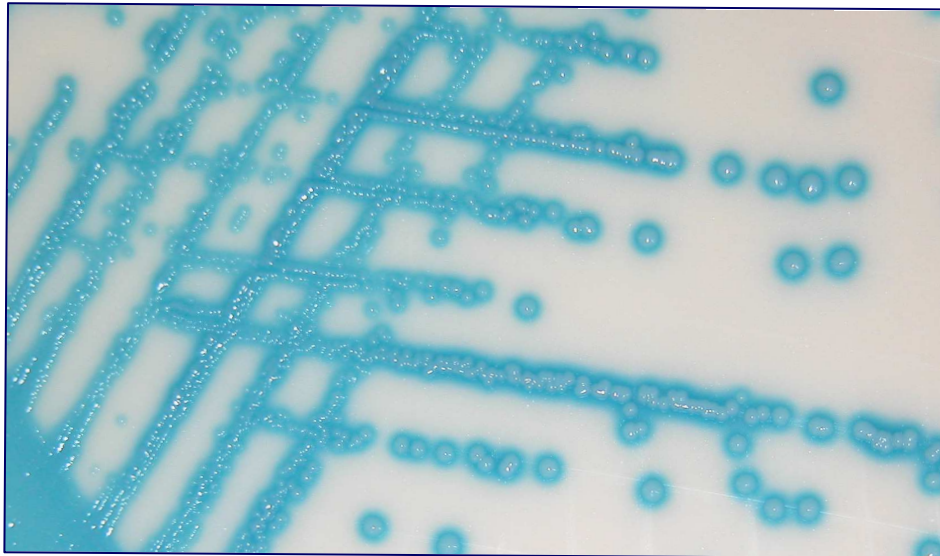
Strepto B ID agar (BioMérieux)



GBS = pink to red colonies

Not 100 % specific for GBS: Id to confirm (latex)

Strep B Select agar (BioRad)



GBS = pale to dark blue-turquoise colonies

Not 100 % specific for GBS: Id to confirm (latex)

Reading and processing of the cultures



POSITIVE GBS Screening if	Orange colonies = GBS	Blue-turquoise colonies = suggestive GBS Id. to confirm	Pink colonies = suggestive GBS Id. to confirm	Beta-hemolytic colonies = suggestive GBS Id. to confirm
Negative GBS Screening if	No orange colonies	No blue-turquoise colonies	No pink colonies	No beta-hemolytic colonies

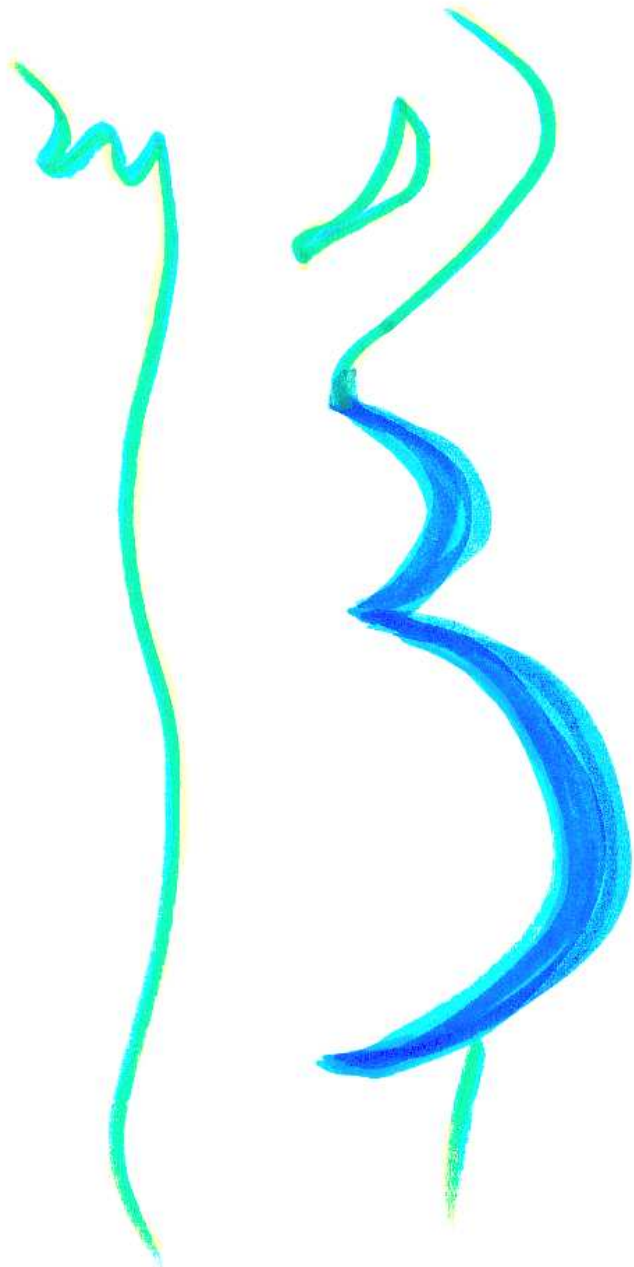
To report Prenatal screening culture results

QUALITATIVE result and not QUANTITATIVE

POSITIVE or NEGATIVE

PRESENCE of GBS or Absence of GBS

- **Never quantify GBS on your final lab report sent to doctor, differentiate origins of swab**
 - Quantification induces “odd attitudes”
 - Not relevant for prediction of status “at delivery”
- **Communication of results to right persons**



Culture-based GBS prenatal screening To optimize critical factors

- **Specimen collection**
 - 35-37 weeks gestation
 - Vagina + rectal swab(s)
- **Specimen transport and storage**
- **Specimen processing**
 - Laboratory procedure
 - Inoculation/Media/Reading/Reporting
 - Identification and AST