

BACTERIOLOGY PROFICIENCY TESTING PROGRAM

General Category

September 25, 2001

This report summarizes the results of the proficiency test administered September 25, 2001 to laboratories in the General Bacteriology category.

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Bacteriology Proficiency Testing Program

GENERAL INFORMATION

The Bacteriology Proficiency Testing Program. Three proficiency testing events are given annually, each consisting of a minimum of five specimens. In order to successfully complete a test event, participating laboratories must achieve a score of 80% or greater. Failure of the testing program is defined as a score of less than 80% on two of three consecutive test events.

Authentication. The presence and identity of the organism(s) in each specimen must be confirmed by at least 90% of the referee or participating laboratories. Referee laboratories are selected from New York State participating laboratories (located throughout the State) with acceptable and reproducible levels of performance. Sample vials are subjected to extensive quality control testing in our laboratory during preparation and storage.

Grading System. Laboratories are to process proficiency test specimens in the same manner as patient specimens. Thus, laboratories are responsible for identifying test isolates to the same level as performed on patient isolates. If your laboratory speciates an organism on special request, then you must also speciate it in the proficiency test; consider speciation to have been requested on all reportable isolates. In addition, laboratories are not responsible for culturing any test samples from specimen sources which they do not process. Information regarding your laboratory's reporting protocol was provided to us in the questionnaire previously distributed to all laboratories. Any changes in reporting protocol must be received by our office prior to the mailout date for proficiency testing for that information to be considered in grading.

Our testing format is in compliance with HCFA guidelines as specified in the regulations of CLIA '88. One-half of our samples require identification of all organisms present. The other half requires that only the pathogenic organism(s) be reported. We recognize the potential for any organism to be pathogenic depending on the clinical condition of the patient. However, our samples are designed so that only well-established pathogens should be reported.

Tests are graded in strict adherence to HCFA guidelines, as specified in the regulations of CLIA '88. Each of the specimens receives a score as determined by the following formula:

$$(a + b)/(c + d + e) \times 100\%$$

a = # correct identifications

b = # correct antibiotic susceptibility results (if applicable)

c = # possible identifications

d = # possible antibiotic susceptibility results (if applicable)

e = # additional organisms reported

Grades for each sample are then averaged to determine the final grade for this testing event. The minimum passing grade for each test event is 80%.

Notes of Interest

The following documents have been recently updated and are available from NCCLS:

M11-A5 Methods for Antimicrobial Susceptibility Testing of Anaerobic Bacteria; Approved Standard – Fifth Edition (2001).

M23-A2 Development of In Vitro Susceptibility Testing Criteria and Quality Control Parameters; Approved Guideline – Second Edition (2001).

The address for NCCLS is:
940 West Valley Road, Suite 1400
Wayne, PA 19087-1898
Phone: (610) 688-0100
Website: www.nccls.org

SEPTEMBER 25, 2001 TEST EVENT

Number of Participating Laboratories

Receiving specimens 258
Returning results 258 (100%)

Grade Distribution		
Score	Number	Percent
100	208	80.6
90 - 99	32	12.4
80 - 89	11	4.3
70 - 79	5	1.9
60 - 69	0	0
<60	2	0.8

BACTERIOLOGY - GENERAL
SEPTEMBER 25, 2001
ANSWER KEY

Specimen No. 1 - Stool (Pathogens Only)

Campylobacter jejuni
Escherichia coli O157:H7 (not authenticated)

Specimen No. 2 – Throat (Pathogens Only)

Group A *Streptococcus*

Specimen No. 3 – Blood - Aerobic / Anaerobic (All Organisms Reported)

Clostridium septicum
No aerobic organisms

Specimen No. 4 – Sputum (Pathogens Only) Antibiotic Susceptibility

Klebsiella pneumoniae
Susceptibility of *K. pneumoniae* to: Cefotaxime - Susceptible
Imipenem - Susceptible

Specimen No. 5 – Urine (All Organisms)

Escherichia coli
Serratia marcescens

Direct Antigen Detection

A (Throat) Positive for Group A *Streptococcus*
B (CSF) Group B *Streptococcus*

REFEREE LABORATORY RESULTS

Specimen Number	Referee Laboratory Responses	Percent*
1	<i>Campylobacter jejuni</i>	100
	<i>E. coli</i> O157:H7 not reported	90
	Presumptive <i>E. coli</i> O157	10
2	Group A <i>Streptococcus</i>	100
3	<i>Clostridium septicum</i>	100
	No aerobic organisms	100
4	<i>Klebsiella pneumoniae</i>	100
5	<i>Escherichia coli</i>	100
	<i>Serratia marcescens</i>	100

* Based on responses of 10 referee laboratories

Specimen Number 1 - Stool (Pathogens Only)

This simulated stool specimen contained two enteric pathogens: *Campylobacter jejuni* and *Escherichia coli* O157:H7.

Campylobacter jejuni was reported by all referee laboratories. Of the participating laboratories that screen stool specimens for *Campylobacter*, 93% isolated this organism. Seventy-eight percent of these laboratories reported the organism as *Campylobacter jejuni*, while 19% identified it as *Campylobacter* species and the remaining 3% reported it as *Campylobacter jejuni ssp. jejuni*.

Both referee and participating laboratory performance in isolating *E. coli* O157:H7 from this specimen was extremely disappointing. Only ten percent of referee laboratories and 27% of participating laboratories that screen stool specimens for *E. coli* O157 isolated this organism. Due to lack of consensus, credit was given to all laboratories for this organism. However, those laboratories which did not isolate *E. coli* O157 from this specimen should carefully evaluate their protocols and review their culture results from this test specimen.

It is disconcerting to note that 9 participating laboratories were unable to isolate either organism from this specimen and reported that it contained no enteric pathogens.

Although our simulated stool specimens usually contain only one enteric pathogen, it is possible that laboratories may encounter stool specimens containing more than one pathogen. The largest waterborne outbreak of *E. coli* O157:H7 in the United States occurred in September, 1999 at the Washington County fairground in upstate New York. In addition to *E. coli* O157:H7, *Campylobacter jejuni* was isolated in a small percentage of patients. It is thought that many more patients were actually coinfecting, but the focus of investigation was on *E. coli* O157:H7 and most stool specimens from patients with HUS-related symptoms were only screened for this organism.

Additional organisms included in this specimen were *Citrobacter freundii* and *Enterobacter cloacae*.

Methods of identification used by laboratories reporting *Campylobacter jejuni* /

C. jejuni ssp. jejuni:

Conventional biochemicals	168
Integrated Diagnostics INDX Campy jcl latex	2
Meridian Diagnostics Meritec Campy test	2
No information given	2
BBL Minitek and hippurate	1
bioMerieux Vitek	1
GenProbe AccuProbe <i>Campylobacter</i> and conventional biochemicals	1
TOTAL	177

Other responses:

***Campylobacter* species**

Conventional biochemicals	35
Integrated Diagnostics INDX Campy jel latex	3
B-D Campyslide and conventional biochemicals	1
bioMerieux Vitek	1
No information given	1
TOTAL	41

Do not process stool specimens 13

Do not test for *Campylobacter* 10

No Enteric Pathogens 9

***Campylobacter jejuni* not reported** 7

Campylobacter coli

Conventional biochemicals 1

**Results of testing for *E. coli* O157:H7 in Specimen No.1:
E. coli O157:H7 not reported**

153
22
13
9

Of the laboratories which isolated *E. coli* O157:H7:

Methods of identification used by laboratories reporting:

***E. coli* O157**

Vitek GNI	14
Dade MicroScan	7
No information given	3
BBL Crystal	2
bioMerieux API 20E	2
Cathra Autoreader	1
Conventional biochemicals	1
Two or more systems	1
TOTAL	31

***E. coli* O157:H7**

Dade MicroScan	3
No information given	3
Vitek GNI	3
Conventional biochemicals	2
TOTAL	11

Presumptive *E. coli* O157

Vitek GNI	4
Dade MicroScan	2
BBL Crystal	1
TOTAL	7

Sorbitol-negative *E. coli*

Dade MicroScan	3
Vitek GNI	2
BBL Crystal	1
bioMerieux API 20E	1
TOTAL	7

***E. coli* O157:(not H7)**

Vitek GNI	2
No information given	1
Two or more systems	1
TOTAL	4

Positive for E. coli Shiga toxins

Meridian Premier EHEC 1

Methods of serological identification used by laboratories reporting:

***E. coli* O157**

Prolab Diagnostics Prolex <i>E. coli</i> O157	9
No information given	9
Meridian Immunocard Stat <i>E. coli</i> O157 Plus	3
Murex Wellcolex <i>E. coli</i> O157	3
Oxoid <i>E. coli</i> O157	3
Remel RIM <i>E. coli</i> O157	3
Difco <i>E. coli</i> O157	1
TOTAL	31

***E. coli* O157:H7**

Conventional biochemicals	2
Meridian Diagnostics Immunocard Stat <i>E. coli</i> O157 Plus	2
No information given	2
Remel RIM <i>E. coli</i> O157:H7	2
Difco <i>E. coli</i> O157:H7 & H7	1
Oxoid <i>E. coli</i> O157	1
Prolab Diagnostics Prolex <i>E. coli</i> O157 & H7	1
TOTAL	11

***E. coli* O157:(not H7)**

Remel RIM <i>E. coli</i> O157:H7	3
BBL <i>E. coli</i> O157 & H7 antisera	1
TOTAL	4

Specimen No. 2 - Throat (Pathogens Only)

This simulated throat specimen contained Group A *Streptococcus*. All referee laboratories and over 99% of participants which process throat specimens identified this organism.

Streptococcus sanguis and *Corynebacterium xerosis* were included as additional organisms in this specimen.

Methods of identification used by laboratories reporting Group A *Streptococcus*:

Conventional biochemicals	63
Murex Streptex	46
Two or more systems	42
BBL Streptocard Acid Latex	39
DPC PathoDx	30
Dade MicroScan	7
bioMerieux Vitek GPI	6
Boule Phadebact	6
The Binding Site Strep latex	4
bioMerieux Vitek API 20 STREP	3
No information given	2
bioMerieux Slidex Strepto kit	1
Difco Fluorescent Antibody to Grp A Strep	1
Lifesign Streptolex	1
Meridian Diagnostics Meritec Strep	1
Pacific Biotech Cards QS Strep A	1
PML Microbiologicals Identicult AE	1
Vitek (unspecified)	1
TOTAL	255

Other reports:

Do not process throat cultures 2

No Pathogens Isolated 1

Additional organisms reported in Specimen 2:

Corynebacterium diphtheriae 1
Corynebacterium species 1

Specimen No. 3 – Blood - Aerobic/Anaerobic (All Organisms)

This simulated blood specimen, which was for both aerobic and anaerobic culture, contained *Clostridium septicum*.

All referee laboratories identified the presence of *C. septicum* in this specimen. Of the participating laboratories that process blood specimens for anaerobic culture, 92% identified *Clostridium septicum*, while 2% reported *Clostridium* species (not *perfringens*) and 2% identified this organism as *Clostridium* species.

All referee and 98% of participating laboratories reported that this specimen was negative for the presence of aerobic organisms.

Methods of identification used by laboratories reporting *Clostridium septicum*:

IDS RapID ANA II	87
bioMerieux Vitek API An-IDENT	45
Vitek ANI	31
bioMerieux Vitek API 20A	25
Dade MicroScan	13
Conventional biochemicals	7
Two or more systems	7
BBL Crystal	3
bioMerieux Vitek (not specified)	2
16S rDNA sequencing	1
TOTAL	221

Other reports:

Do not process blood cultures 11

Do not isolate anaerobes 7

***Clostridium* species (not *perfringens*)**

bioMerieux Vitek API An-IDENT	3
Conventional biochemicals	2
TOTAL	5

***Clostridium* species**

bioMerieux Vitek API An-IDENT	2
bioMerieux Vitek API 20A	1
Conventional biochemicals	1
Vitek ANI	1
TOTAL	5

Anaerobic gram positive bacilli 2

<i>Clostridium clostridioforme</i> bioMerieux Vitek API An-IDENT	2
<i>Clostridium innocuum</i> bioMerieux Vitek API An-IDENT	1
<i>Clostridium paraputrificum</i> IDS RapID ANA II	1
<i>Clostridium perfringens</i> IDS RapID ANA II	1
No <i>Bifidobacterium</i> present	1
Not reported	1

Participating laboratories reporting that Specimen 3 contained:

No aerobic organisms	242
Do not process blood cultures	11
Group A <i>Streptococcus</i>	1
<i>Micrococcus</i> species	1
<i>Staphylococcus aureus</i>	1
<i>Staphylococcus warneri</i>	1
<i>Streptococcus sanguis</i>	1

Additional organisms reported in Specimen 3:

<i>Corynebacterium</i> species	1
<i>Prevotella melaninogenica</i>	1

Specimen No. 4 – Sputum (Pathogens Only) and Antibiotic Susceptibility

The pathogenic organism in this simulated sputum specimen was *Klebsiella pneumoniae*. This organism was identified by all referee laboratories and by 99% of participating laboratories which process sputum cultures.

Antibiotic susceptibility testing was indicated for this specimen. This isolate of *Klebsiella pneumoniae* was susceptible to cefotaxime and imipenem. Results of susceptibility testing on this organism can be found on pages 19 and 20.

Streptococcus sanguis was included in this specimen as additional flora.

Methods of identification used by laboratories reporting *Klebsiella pneumoniae*:

Dade MicroScan	83
Vitek GNI	63
bioMerieux Vitek API 20E	37
Vitek (not specified)	34
Two or more systems	19
BBL Crystal	5
Conventional biochemicals	5
IDS RapID ONE	2
BBL Enterotube II	1
Cathra Autoreader	1
TOTAL	250

Other reports:

Do not process sputum specimens 6

Klebsiella pneumoniae ssp. pneumoniae

Difco Pasco 1

Klebsiella species

Dade MicroScan 1

Results of Antibiotic Susceptibility Testing of *Klebsiella pneumoniae* with:

CEFOTAXIME

Susceptible

MicroScan	69
Vitek	54
Kirby-Bauer	32
Two or more systems	5
Trek MIC	2
Agar dilution	1
E-test	1
TOTAL	164

Do not test cefotaxime 85

Do not process specimen source 6

No result given 2

Intermediate

Kirby-Bauer 1

IMIPENEM

Susceptible

Vitek	82
MicroScan	77
Kirby-Bauer	47
Two or more systems	5
Trek MIC	2
Agar dilution	1
E-test	1
TOTAL	215

Do not test imipenem 37

Do not process specimen source 6

Antibiotic Susceptibility Results - Participating & Referee Labs
Klebsiella pneumoniae

Antibiotic	Susceptible		Intermediate		Resistant		Not Tested ¹		Do not process source ²		No result reported	
	R ^a	P ^b	R	P	R	P	R	P	R	P	R	P
Cefotaxime	8	156	0	1	0	0	2	83	0	6	0	2
Imipenem	10	205	0	0	0	0	0	37	0	6	0	0

^aReferee Laboratories (10 labs total)

^bOther Participating Laboratories (258 labs total)

¹Antibiotic not tested / reported for this organism

²Do not process specimen source

Specimen No. 5 – Urine (All Organisms)

This simulated urine specimen contained *Escherichia coli* and *Serratia marcescens*.

All referee laboratories and 99% of the participating laboratories that process urine specimens identified *E. coli*. *Serratia marcescens* was identified by all referee laboratories and by 96% of the participating laboratories that processed this specimen type.

Methods of identification used by laboratories reporting *Escherichia coli*:

Dade MicroScan	81
Vitek GNI	69
bioMerieux Vitek API 20E	45
bioMerieux Vitek (not specified)	33
Two or more systems	9
BBL Crystal	6
Conventional biochemicals	6
IDS RapID ONE	2
BBL Enterotube II	1
Cathra Autoreader	1
Difco Pasco	1
No information given	1
TOTAL	255

Other responses:

***Escherichia* species**

Dade MicroScan	1
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Do not process urine cultures	1
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Not reported	1
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Methods of identification used by laboratories reporting *Serratia marcescens*:

Dade MicroScan	83
Vitek GNI	69
bioMerieux Vitek API 20E	40
bioMerieux Vitek (not specified)	33
Two or more systems	9
Conventional biochemicals	6
BBL Crystal	4
IDS RapID ONE	1
Cathra Autoreader	1
Difco Pasco	1
No information given	1
TOTAL	248

Other responses:

Serratia species

bioMerieux Vitek API 20E	3
BBL Crystal	1
Dade MicroScan	1
TOTAL	5

Not reported 2

Do not process urine cultures 1

Gram negative bacillus 1

Serratia plymuthica

IDA RapID ONE 1

Direct Antigen Detection Specimen

All participating laboratories which perform direct antigen testing received either a simulated throat swab to be tested for Group A *Streptococcus* or a simulated CSF to be tested for bacterial antigens. Information provided in the Bacteriology Questionnaire was used to determine which type of specimen to send to each laboratory.

Specimen A - Source: Throat for Group A *Streptococcus*

This specimen was positive for Group A *Streptococcus*. All participating laboratories that tested this specimen reported it as positive for Group A *Streptococcus*.

Test kits used by laboratories reporting Specimen A as: Positive for Group A *Streptococcus*

Becton-Dickinson Directigen 1-2-3 Grp A Strep	13
Abbott Signify Strep A	8
Pacific Biotech Cards Q.S. Strep A	4
BioStar Strep A OIA	3
Lifesign Status AccuStrep A	3
No test kit indicated	3
Beckman-Coulter Icon Fx Strep A	2
GenProbe Group A Strep	2
Applied Biotech Sure Strep +	1
Becton-Dickinson Link 2 Strep A	1
BioStar Acceava Strep A	1
BioStar (unspecified)	1
DPC Rapid Strep A	1
Fisher Sure-View Strep A	1
Genzyme Contrast Strep A	1
RIM A.R.C. Strep A Test	1
Wampole Clearview Strep A	1
Wyntek OSOM	1
TOTAL	48

Specimen B - Source: CSF

This specimen contained Group B *Streptococcus*. Of the participating laboratories that tested this specimen, 90% reported it as positive for Group B *Streptococcus*.

Test kits used by laboratories reporting Specimen B as positive for Group B *Streptococcus*:

Murex Wellcogen Bacterial Antigen kit	38
B-D Directigen Meningitis Combo Test	37
No information provided	1
TOTAL	76

Other reports:

Negative for all antigens

Murex Wellcogen Bacterial Antigen kit	8
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Note:

The inclusion of specimens for direct antigen testing does not reflect any endorsement by the New York State Department of Health of use of these tests in the clinical laboratory.

BACTERIAL IDENTIFICATION BY PARTICIPATING LABORATORIES

	<u>Number Reported</u>	<u>%</u>
SPECIMEN NUMBER 1		
<i>Campylobacter jejuni</i>	171	66.3
<i>Campylobacter</i> species	41	15.9
Do not process stool specimens	13	5.0
Do not test for <i>Campylobacter</i>	10	3.9
No Enteric Pathogens	9	3.5
<i>Campylobacter jejuni</i> not reported	7	2.7
<i>Campylobacter jejuni ssp. jejuni</i>	6	2.3
<i>Campylobacter coli</i>	1	0.4
<i>E. coli</i> O157:H7 not reported	153	59.3
<i>E. coli</i> O157	31	12.0
Do not test for <i>E. coli</i> O157:H7	22	8.5
Do not process stool specimens	13	5.0
<i>E. coli</i> O157:H7	11	4.3
No Enteric Pathogens	9	3.5
Presumptive <i>E. coli</i> O157	7	2.7
Sorbitol-negative <i>E. coli</i>	7	2.7
<i>E. coli</i> O157:(not H7)	4	1.6
Positive for <i>E. coli</i> Shiga toxins	1	0.4

SPECIMEN NUMBER 2		
Group A <i>Streptococcus</i>	255	98.8
Do not process throat cultures	2	0.8
No Pathogens Isolated	1	0.4

SPECIMEN NUMBER 3		
<i>Clostridium septicum</i>	221	85.7
Do not process blood cultures	11	4.3
Do not isolate anaerobes	7	2.7
<i>Clostridium</i> species (not <i>perfringens</i>)	5	1.9
<i>Clostridium</i> species	5	1.9
Anaerobic gram positive bacilli	2	0.8
<i>Clostridium clostridioforme</i>	2	0.8
<i>Clostridium innocuum</i>	1	0.4
<i>Clostridium paraputrificum</i>	1	0.4
<i>Clostridium perfringens</i>	1	0.4
No <i>Bifidobacterium</i> present	1	0.4
Not reported	1	0.4

No aerobic organisms	242	93.8
Do not process blood cultures	11	4.3
Group A <i>Streptococcus</i>	1	0.4
<i>Micrococcus</i> species	1	0.4
<i>Staphylococcus aureus</i>	1	0.4
<i>Staphylococcus warneri</i>	1	0.4
<i>Streptococcus sanguis</i>	1	0.4

SPECIMEN NUMBER 4

<i>Klebsiella pneumoniae</i>	250	96.9
Do not process sputum specimens	6	2.3
<i>Klebsiella pneumoniae ssp. pneumoniae</i>	1	0.4
<i>Klebsiella</i> species	1	0.4

SPECIMEN NUMBER 5

Escherichia coli	255	98.8
Escherichia species	1	0.4
Do not process urine cultures	1	0.4
Not reported	1	0.4
<i>Serratia marcescens</i>	248	96.1
<i>Serratia</i> species	5	1.9
Not reported	2	0.8
Do not process urine cultures	1	0.4
Gram negative bacillus	1	0.4
<i>Serratia plymuthica</i>	1	0.4

DIRECT ANTIGEN SPECIMEN

A. Positive for Group A <i>Streptococcus</i>	48	100.0
B. Group B <i>Streptococcus</i>	76	90.5
Negative	8	9.5