CRITICAL LINK

John M. Colmers
Secretary

A Publication of the Maryland Department of Health and Mental Hygiene

The Laboratories Administration—Maryland's State Public Health Laboratory

Critical Link Going Paperless!

In order to save the cost of paper and delivery, and protect the environment, we are asking our readership to use our email system to receive the *Critical Link* electronically. Please send an email to criticallink@dhmh.state.md.us and we will put you on the monthly email list.

You may also access it at http://www.dhmh.state.md.us/labs/html/critical-link.html

However, if you do not have computer access and wish to continue receiving the *Critical Link* via hard copy/snail mail delivery, please send us a reply and update your address or indicate that no change is needed. Our mailing address is:

Critical Link
Laboratories Administration - DHMH
201 West Preston Street
Baltimore MD 21201

If we do not receive a response, we will be discontinuing your hard copy subscription.

Thank you very much for assisting us and for your interest in the *Critical Link*.

Evolving Bacterial Resistance to β-Lactams

Bugs continue to outsmart drugs

As bacterial resistance evolves, many infectious bacterial illnesses can no longer be treated effectively with commonly used β-lactam antibiotics. These include the penicillins, the cephalosporins, monobactam, and carbapenems. This has brought about more aggressive laboratory and infection control strategies, along with alternate antibacterial drug regimens.

Background

Progressive development of β-lactam drugs resulted in the extended spectrum of antibacterial activity. Thereafter a bacterial enzyme emerged that destroyed the extended spectrum β-lactams. Extended Spectrum β-Lactamase (ESBL)-producing Gram-negative enteric organisms were discussed in the July, 2001, issue of the *Critical Link*.[1] *In vitro,* these plasmid-mediated ESBLs appeared to be resistant to all penicillins, the first generation (cephalothin) and third generation cephalosporins (ceftriaxone, ceftazidime, etc.), while behaving as if susceptible to the second generation (cefoxitin, cefotetan). *In vivo*, ESBLs are actually resistant to all cephalosporins and monobactam (aztreonam), but not the carbapenums. The mutated gene responsible for the enzyme able to hydrolyze all these β-lactam antibiotics is often linked to other unrelated resistance genes such as those conferring resistance to fluoroquinolones (ciprofloxacin, levofloxacin), aminoglycosides (gentamicin, tobramycin, amikacin) and trimethoprim-sulfamethoxazole.[6,25] A similar β-lactamase designated Amp C type[2] exhibits resistance to first, second, and third generation cephalosporins in vitro.

As bacteria with these resistance factors become part of a patient's bowel flora, they can be transferred to household

(Continued on page 2)

May 2009
Volume 13, Number 5

CRITICAL LINK

PRODUCTION MANAGER

Georgia Corso

EDITORIAL BOARD

Jack DeBoy, Dr. P. H.
Prince Kassim, Ph.D.
Fizza Majid, Ph.D.
Robert Myers, Ph.D.
Jafar Razeq, Ph.D.
Jim Svrjcek, B.A.
Michael Wajda, M.S., J.D.
Chengru Zhu, Ph.D.

LABORATORIES ADMINISTRATION

Director
Jack DeBoy, Dr.P.H.

Deputy Director
for Scientific Programs
Robert Myers, Ph.D.

Deputy Director
for Administrative and
Regulatory Programs
Michael Wajda, M.S., J.D.

TECHNICAL QUESTIONS

Questions concerning
technical content of this newsletter
may be referred to
Dr. Jack DeBoy at 410-767-6100

The Critical Link is published monthly
by the staff of the
Laboratories Administration
Department of Health & Mental Hygiene
201 W. Preston Street
Baltimore, Maryland 21201
(Phone 410-767-6909)

(Continued from page 1)

Evolving Bacterial Resistance to β-Lactams

members who then become reservoirs of resistant intestinal bacteria that also can transfer resistance to other fecal coliforms.[3]

When the fourth generation cefepime could not offer assurance of cure,[4] a drug class of choice to treat ESBLs became carbapenem.[5] This class of β-lactams has broad spectum activity and has proved reliable because it is resistant to β-lactamases. It was derived from thienamycin, a natural product of the actinomycete, *Streptomyces cattleya*. Note its similar structure to penicillins and cephalosporins in Figures 1 & 2.

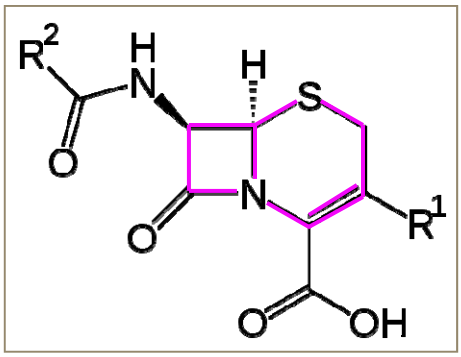

Figure 1. The molecular structure diagram of the cephalosporings, originally derived from the saprophytic mold *Cephalosporium acremonium*.

The emergence of new enzymes against the carbapenems has rendered this class of previous drugs of choice no longer effective.

Mainstay drug becomes ineffective

The first documented *K. pneumoniae* resistant to carbapenems by means of a carbapenemase was isolated in 1996, in North Carolina.[6] Thus the new additions to the alphabet soup, *Klebsiella pneumoniae* carbapenemase-producer (KPC) and carbapenem resistant Enterobacteriaceae (CRE). Three variants of this Class A carbapenemase enzyme appeared, KPC-1 in North Carolina, KPC-2 in Baltimore, and KPC-3 in New York.[7] KPCs were reported from the northeast (New Jersey & New York) westward and were also reported outside the United States in France, Greece, Scotland, Sweden, Israel, China, and Columbia. KPC was also spreading beyond the *Klebsiella* species to other members of the *Enterobacteriaceae* as well as other Gram-negatives.[6] The gene coding for KPC is located on a plasmid flanked by transposon (mobile) sequences, making it more readily transferable between organisms.[8,9]

Clinical findings

In January of 2009, the United Kingdom issued a National Resistance Alert [10] regarding carbapenemases in *Enterobacteriaceae*. This recent addition to the multi-drug resistant nosocomial pathogens, C-producing *K. pneumoniae*, was being recovered from patients with longer hospital stays (especially in ICUs[11]), those given multiple antibiotic regimens, the mechanically ventilated, critically ill, chronically alcoholic, neutropenic, and those with central venous catheters and exposure to other invasive devices.[12,13] The sites have included urinary, intestinal and respiratory tracts, wounds, and blood. Hand carriage is probably the biggest factor for caregivers. It may be of negligible importance for a healthy person, but very consequential for patients with co-morbidities such as diabetes, cardiac diseases, and chronic airway problems, who had the poorest outcomes.[14]

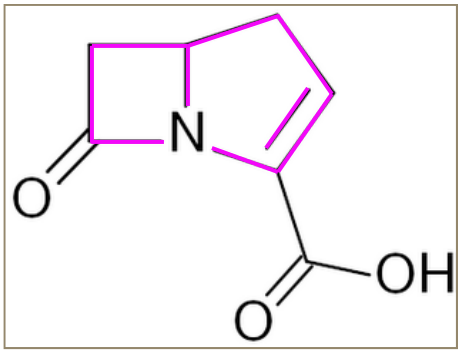

Figure 2. The molecular structure diagram of carbapenem. The sulfur atom is replaced with a carbon atom in the main backbone.

Laboratory diagnosis

The laboratorian, observing resistance to the third generation cephalosporins on the antibiotic susceptibility report, will suspect that the enteric isolate, particularly *K. pneumoniae* and *E. coli*, may be an ESBL-producer. The laboratory will note findings on the antibiotic susceptibility report and proceed from there. The confirmatory testing is then performed as follows. The confirmation of ESBL involves comparing the disk susceptibility zones of the third generation cephalosporins, ceftazidime and cefotaxime, with the zones of their corresponding disks containing the β-lactamase inhibitor clavulanic acid, in addition to the antibiotic. If there is a 5mm or greater zone diameter around the disk with the clavulanate, then the isolate in question is an ESBL.[15] Appropriate positive and negative controls are run in parallel.

If the antibiotic panel contains the weakest of the carbapenems, ertapenem, as recommended for KPC screening by some,[9,16] then, when a Gram-negative isolate exhibits resistance, the laboratorian performs the confirmatory Modified Hodge Test (MHT).[17,18] KPC suspect isolates are sent to the Laboratories Administration's Public Health Microbiology Division for confirmatory testing (see figures 4,5, and 6.)

In this procedure, a small Mueller-Hinton plate is inoculated similarly to the standardized Kirby-Bauer Method with an American Type Culture Collection (ATCC) control strain of *E. coli* susceptible to carbapenems. The laboratorian swabs the entire surface of the agar plate with a standardized diluted saline suspension of this organism, so that a uniform lawn of growth can be expected after overnight incubation at 35°C. Shortly following this inoculation, a meropenem (or ertapenem) disk [19] is placed in the center of the plate. Then three separate microbes are streaked radially, from the disk outward to the edge of the plate (as shown in Figure 3), using loops from colonies. One microbe is the isolate to be tested and the other two are *K. pneumoniae* control strains, one known to be positive for KPC, and the other negative. The next day, following incubation, a zone of inhibition in the lawn of growth appears around the meropenem disk. However, where the positive control streak intercepts the zone edge, there is a clover leaf-like indentation in the zone edge because the meropenem is hydrolyzed along the streak line (see figure 3c.) There is no such indentation along the negative control. The streak line of the suspected

(Continued on page 4)

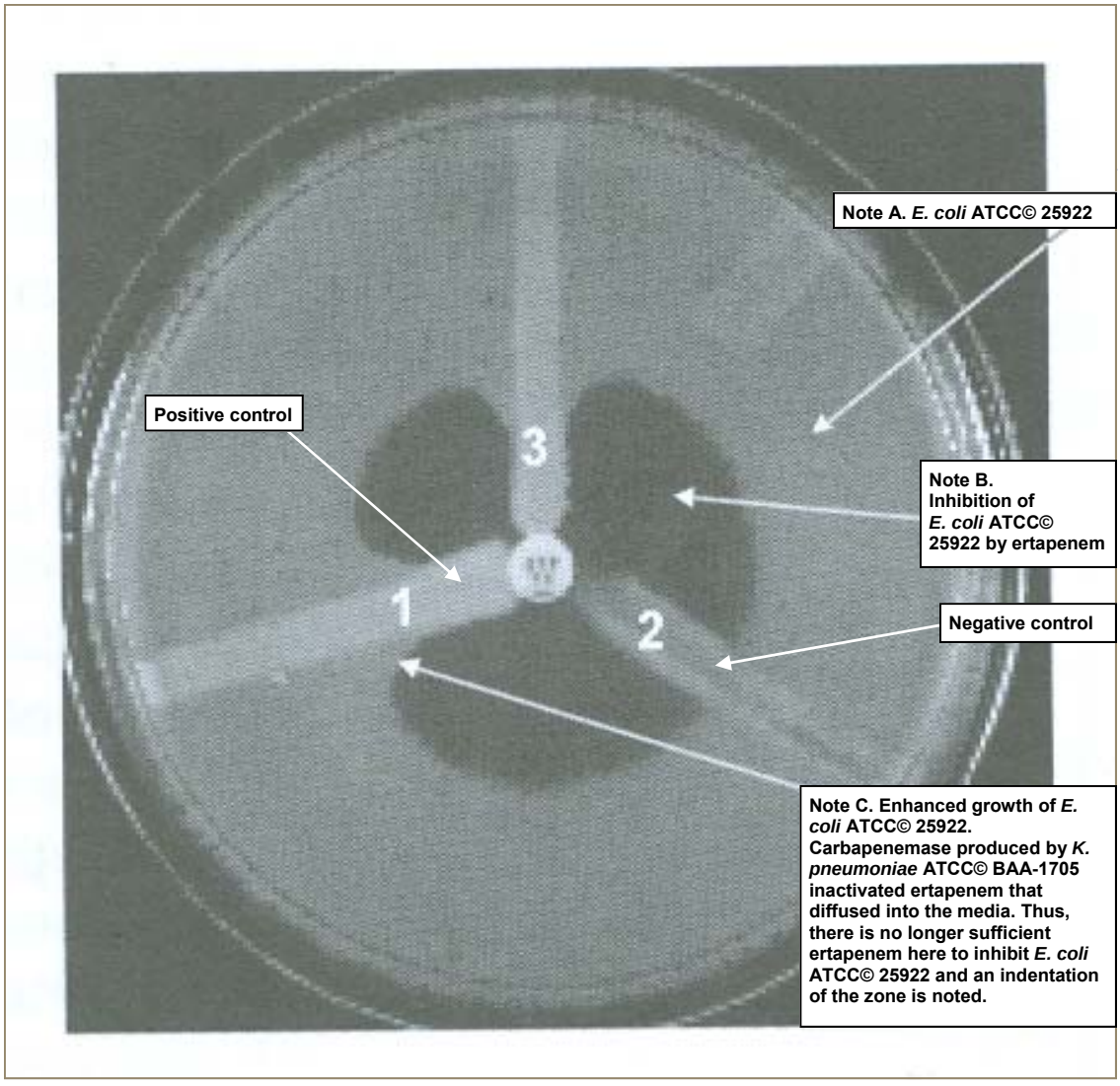

Figure 3. Ertapenem is used instead of meropenem here. Either is acceptable. Photo of modified Hodge test is by courtesy of Glen Fine of the Clinical and Laboratory Standards Institute (CLSI). From July, 2008 to April, 2009, 34 Gram-negative rods suspicious for KPC were submitted to the Maryland DHMH Laboratories Administration. Of these, 24 were confirmed positive, 2 yielded inconclusive results and 8 were negative for KPC.[29]

Figure 4. This large Mueller-Hinton agar plate demonstrates positive controls of the MHT as performed in the Public Health Microbiology Division using a known positive strain of *K. pneumoniae* for all four streaks. Plate made by Damini Jain and Izabella Rakhunov.

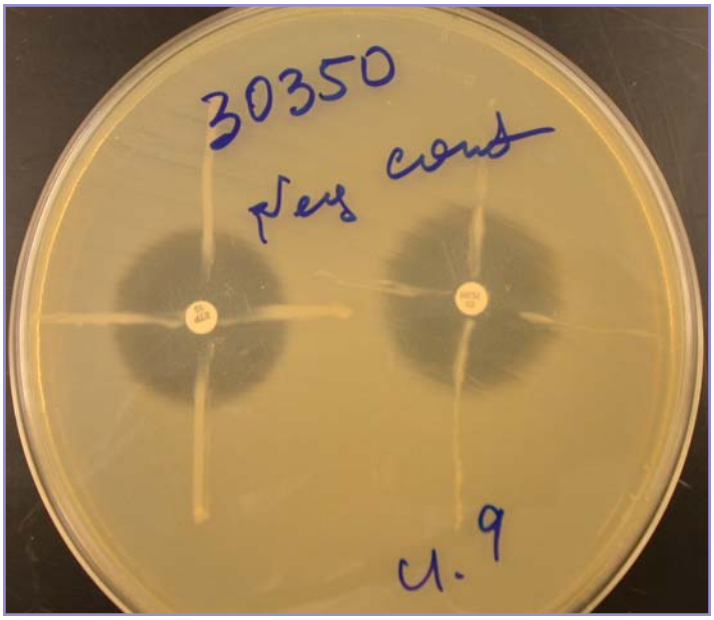

Figure 5. This large Mueller-Hinton agar plate demonstrates negative controls of the MHT as performed in the Public Health Microbiology Division using a known negative strain of *K. pneumoniae* for all four streaks. Plate made by Damini Jain and Izabella Rakhunov.

(Continued from page 3)

Evolving Bacterial Resistance to β-Lactams

KPC isolate is compared with the two control streak lines to determine whether it is positive or negative. This test is 100% sensitive for KPC and also detects other classes of carbapenemase,[9] such as those produced by Serratia, Pseudomonas, and Acinetobacter. Therefore, when the MHT is positive, the carbapenum should not be interpreted as resistant and the MIC value should be reported as per 2009 CLSI recommendations, with a qualifying statement that the isolate is "KPC suspicious.[17]" The laboratory then notifies the attending physician and the infection control practitioner through established channels.

Current recommendations

The CDC&P and the Healthcare Infection Control Practices Advisory Committee (HICPAC) have strongly urged the following:

- Strict contact precautions including gowns and gloves
- Implementing patient cohorting
- 100% compliant hand hygiene before and after contact with patient
- Environmental disinfection
- Notification of clinical staff regarding all CRE (mostly *K. pneumoniae* & *E. coli*)
- Possible point prevalence survey of high risk areas (e.g., ICU)

Antibiotic treatment options for use by clinicians are very limited. As such, the laboratory should be vigilant for possible CRE.[25] Two older drugs are effective, but have nephrotoxic side effects. These are Polymyxin B and Colistin and are being reevaluated. Tigecycline is a new semisynthetic glycycline related to the tetracyclines, and therefore only bacteriostatic, but with a broad spectrum activity including ESBLs and CREs. [22,23,24]

Future Prospects

The American Society for Microbiology (ASM), in collaboration with CLSI, is considering lowering breakpoints that predict resistance for cephalosporins and aztreonam, which would make ESBL testing unnecessary. They also are considering lowering the breakpoints for carbapenems, which would likewise obviate the need for the confirmatory carbapenemase inactivation test (MHT).[26] Also, future guidelines for susceptibility to antibiotics may incorporate relationships of pharmacokinetics (what the body does to drugs) and the pharmacodynamics (what the drugs do to the body).[27] A fifth generation cephalosporin, ceftobiprole,[28] is being considered by the FDA and newer carbapenems are being developed. Meanwhile, the watchwords for us are vigilance and judicious antibiotic stewardship.

This article was written by
Dr. Robert Waltersdorff of the
Eastern Shore Regional Laboratory

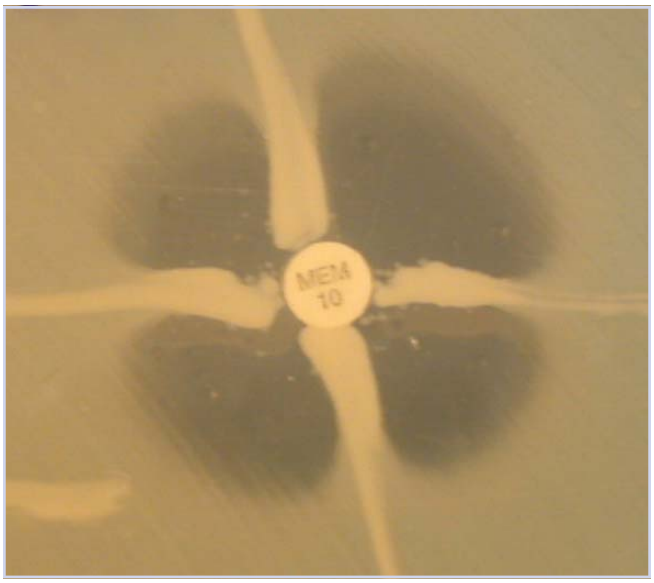

Figure 6. On this close-up of a positive MHT, one can appreciate the clover leaf-like appearance of the zone and streak intercepts. Source: Public Health Microbiology Division at the Central Laboratory. Plate made by Damini Jain and Izabella Rakhunov.

References

[1] 2001."Resisting Resistance: Gram-Negative β-Lactamases," *Critical Link* 5(7):1-5.

[2] Murray, P.R.et al. 2007. *Manual of Clin. Micro.,* 9th Ed., Chapt.74, Phenotypic Tests for Antibacterial Resistance, pp1181-1182.

[3] Valverde, A. et al. 2008. "High Rate of Intestinal Colonization with ESBL-Producing Organisms in Household Contacts of Infected Community Patients," *J. Clin. Micro.* 46(8):2796-2799.

[4] Coudron, P.E. 2003."Occurrence of Extended-Spectrum and AmpC β-Lactamases in Blood stream Isolates of *Klebsiella pneumoniae*: Isolates Harbor Plasmid-Mediated FOX-5 and ACT- 1 AmpC β-Lactamases," *J. Clin. Micro*. 41(2):772-777.

[5] 2009. http://en.wikipedia.org/wiki/Cephalosporin and http://en.wikipedia.org/wiki/carbapenem

[6] Quale, J. 2008."Global Spread of Carbapenmase-Producing *Klebsiella pneumoniae*," *Microbe* 3 (11):516-520.

[7] Livermore, D. 2003. "Metallo-β-Lactamases & Other Carbapenemases," *ISAAR Lectures*, 44-46, Health Protection Agency, UK.

[8] Marschall, J. et al. 2007. "Presence of the KPC carbapenemase gene in *Enterobacteriaceae* bacteremia, correlation with carbapenem susceptibility and the impact on clinical outcomes," 47th Annual ICAAC Sept. 17-20, Chicago, #196.

[9] Patel, J.B. 2007. "Carbapenem Resistance in *Enterobacteriaceae*," CDC, Antimicrobial Resistance Team, Div. Health Quality Promotion, pp. 1-34. http://www.state.nj.us/health/phel/documents/teleconf/carbapenem_powerpoint.ppt

[10] 2009. "National Resistance Alert: Carbapenemases in *Enterobacteriaceae*," *Health Protection Report* 3 (4), 30 Jan. HPA.

[11] 2008. "*Klebsiella pneumoniae* Carbapenemase (KPC)- Producing Organisms," Johns Hopkins Hospital, Epidemiol. & Inf. Control, KPC Educ. for Nursing Staff, Jan 28.

[12] Gottesman, T. 2008 "Household Transmission of Carbapenemase-producing *Klebsiella pneumoniae*," (CDC)*EID* 14 (5):859.

[13] 2009. "Guidance for Control of Infections with Carbapenem-Resistant or Carbapenemase-Producing *Enterobacteriaceae* in Acute Care Facilities," (CDC) *MMWR* 58(10) 256-260.

[14] Chen, L.F. 2009. "*Klebsiella pneumoniae* Carbapenemase: Extended-Spectrum beta- Lactamase Continues to Go Global," *Medscape Inf. Dis.*, 2/12, article 587949.

[15] Dudley, M.N. 2009."Appendix A. Screening and Confirmatory Tests for ESBLs in *Klebsiella pneumoniae, K. oxytoca, Escherichia coli* and *Proteus mirabilis*." Performance Standards for Anti- microbial Susceptibility Testing: 19th Informational Supplement (CLSI) M100-S19 29 (3):120-121.

[16] McGettigan, S.E. et al 2009."Specificity of Ertapenem Susceptibility Screening for Detection of *Klebsiella pneumoniae* Carbapenemases." *J.Clin.Micro*. 47(3):785-786.

[17] Dudley, M.N. 2009."Appendix G. Screening and Confirmatory Tests for Suspected Carbapenemase Production in Enterobacteriaceae." Performance Standards for Antimicrobial Susceptibility Testing: 19th Informational Supplement (CLSI) M100-S19 29 (3):136-139.

[18] 2009. "Modified Hodge Test for Carbapenemase Detection in *Enterobacteriaceae*." CDC Procedure, DHHS. pp. 1-3.

[19] Hindler, J.F. 2009. "2009 CLSI Standards for Antimicrobial Susceptibility Testing." APHL Teleconference, Jan, pp 1-28.

[20] 2008. "Case Study: Carbapenem-resistant *Klebsiella pneumoniae*." Multi-level Antimicrobial Susceptibility Testing Resources (MASTER). CDCP, DHHS, Nov., pp. 1-6.

[21] Rebelo, K. 2009. "CDC, HICPAC Issue Guidelines to Treat Carbapenem-Resistant *Klebsiella pneumoniae* in Acute Care Facilities." *Medscape Medical News* March 30, article 590369.

[22] Pillar, C.M. et al.2008. "In Vitro Activity of Tigecycline against Gram-Positive and Gram-Negative Pathogens as Evaluated by Broth Microdilution and Etest." *J.Clin.Micro*. 46(9): 2862-2867.

[23] Kaufman, M. 2005. "FDA Approves New Antibiotic for Resistant Bacteria." DHMH Daily News Clippings, (*Washington Post*), 6/17.

[24] 2008. "Establishing the Role of Tigcycline in an era of Antimicrobial Resistance." (Medscape) *Expert. Rev. Anti. Infect. Ther.* 6(5):5570567.

[25] 2008. "KPC-producing *Enterobacteriaceae*: Fact Sheet for Clinical and Public Health Microbiology Laboratories." pp. 1-7. 3_M100-S18 KPC fact D 1/16/2008.

[26] 2009. "ASM Participates in CLSI Meeting on Antimicrobial Susceptibility Testing." Public Affairs Report, *Microbe* 4(4):167-168.

[27] Fife, R. et al. 2009. "Effect of differences in MIC values on clinical outcomes in patients with bloodstream infections caused by gram-negative organisms treated with levofloxacin." *Antimicrob. Agents Chemother*. 53:1074-1079.

[28] Wang, S.S. 2008. "J&J Antibiotic Hits Road block." (DHMH News Clippings) *Wall Street Journal*, 3/19 D8.

[29] Personal communication from Damini Jain, supervisor of the Clinical Microbiology Division, at the Central Laboratory in Baltimore, 4/17/09.

Laboratory Statistics

Reported from the
Laboratories Administration
during the month of
February 2009

ENTERIC BACTERIOLOGY

GENUS SEROVAR	SEX	AGE	#	JURISDICTION
CAMPYLOBACTER JEJUNI				
	M	67	1	BALTIMORE
	M	31	1	BALTIMORE
	M	7	1	BALTIMORE
	M	1	1	BALTIMORE
	F	61	1	CHARLES
	M	68	1	MONTGOMERY
	F	71	1	OUT OF STATE
	F	3	1	PRINCE GEORGE'S
	M	0	1	TALBOT
CAMPYLOBACTER JEJUNI SS DOYLEI				
	M	74	1	BALTIMORE
	F	23	2	MONTGOMERY
CAMPYLOBACTER SPECIES				
	M	43	1	BALTIMORE CITY
ESCHERICHIA COLI, SEROTYPE O103:H2				
	U	54	1	OUT OF STATE
	U	2	1	OUT OF STATE
	M	0	1	OUT OF STATE
	F	5	1	OUT OF STATE
ESCHERICHIA COLI, SEROTYPE O111:NON-MOTILE				
	F	29	1	PRINCE GEORGE'S
	F	1	1	PRINCE GEORGE'S
ESCHERICHIA COLI, SEROTYPE O157:H7				
	F	17	2	ANNE ARUNDEL
	M	3	1	BALTIMORE
	F	6	1	BALTIMORE CITY
	M	0	2	OUT OF STATE
	U	1	1	OUT OF STATE
ESCHERICHIA COLI, SEROTYPE O26:H11				
	M	23	1	WICOMICO
ESCHERICHIA COLI, SEROTYPE OROUGH:H28				
	U	1	1	OUT OF STATE
SALMONELLA				
	F	0	1	BALTIMORE
	F	0	1	BALTIMORE CITY
	M	3	1	BALTIMORE CITY
	F	64	1	FREDERICK
	M	28	1	HARFORD
	U	59	1	OUT OF STATE
	F	71	1	TALBOT
	F	14	1	WICOMICO
SALMONELLA 6,7:-:1,5				
	F	44	1	MONTGOMERY
	F	57	1	TALBOT
SALMONELLA AGONA				
	F	16	1	BALTIMORE
	F	0	1	BALTIMORE
	F	30	1	BALTIMORE
SALMONELLA ENTERITIDIS				
	F	83	1	ANNE ARUNDEL
	M	71	1	BALTIMORE
	U	0	1	BALTIMORE CITY
	U	0	1	BALTIMORE CITY
	F	0	1	BALTIMORE CITY
	F	66	2	BALTIMORE CITY
	F	48	1	BALTIMORE CITY
	F	4	1	BALTIMORE CITY
	F	1	1	BALTIMORE CITY
	F	0	3	BALTIMORE CITY
	M	0	1	BALTIMORE CITY
	M	55	1	BALTIMORE CITY
	M	52	1	BALTIMORE CITY
	M	52	1	BALTIMORE CITY
	M	45	1	BALTIMORE CITY
	M	43	1	BALTIMORE CITY
	M	20	1	BALTIMORE CITY
	M	7	3	BALTIMORE CITY
	M	3	1	BALTIMORE CITY
	M	1	1	BALTIMORE CITY
	M	29	1	CHARLES
	M	64	1	FREDERICK
	F	0	1	MONTGOMERY
	F	61	1	MONTGOMERY
	F	54	1	MONTGOMERY
	M	90	1	MONTGOMERY
	U	41	1	OUT OF STATE
	M	6	1	OUT OF STATE
	F	77	1	TALBOT
	F	2	1	UNKNOWN
SALMONELLA KENTUCKY				
	F	2	1	HARFORD
SALMONELLA NEWPORT				
	F	15	1	MONTGOMERY
	F	46	1	OUT OF STATE
	F	37	1	WASHINGTON
SALMONELLA POONA				
	M	27	1	HARFORD
SALMONELLA SER 4,12:I:-				
	F	32	1	BALTIMORE
SALMONELLA SER 4,5,12:I:-				
	F	9	1	BALTIMORE CITY
	F	1	1	OUT OF STATE
	F	1	1	OUT OF STATE
	F	18	1	PRINCE GEORGE'S
	F	46	1	WASHINGTON
SALMONELLA SER TYPHI				
	U	51	1	BALTIMORE
	F	14	1	BALTIMORE CITY
SALMONELLA SER TYPHIMURIUM				
	M	63	2	CHARLES
	F	8	1	TALBOT
SALMONELLA THOMPSON				
	F	0	1	UNKNOWN
SALMONELLA TYPHIMURIUM VAR COPENHAGEN				
	M	30	1	WASHINGTON
SHIGELLA FLEXNERI				
	M	43	1	MONTGOMERY
	F	63	1	OUT OF STATE
	M	1	1	OUT OF STATE
SHIGELLA FLEXNERI II:3,4				
	F	3	1	HARFORD
SHIGELLA FLEXNERI VARIANT X - :7,8				
	M	33	1	OUT OF STATE
SHIGELLA SONNEI				
	U	51	1	ANNE ARUNDEL
	U	62	1	BALTIMORE CITY
	F	0	2	BALTIMORE CITY
	F	21	1	BALTIMORE CITY
	F	11	1	BALTIMORE CITY
	F	6	1	BALTIMORE CITY
	F	3	1	BALTIMORE CITY
	M	0	1	BALTIMORE CITY
	M	52	1	BALTIMORE CITY
	U	44	1	OUT OF STATE
	F	66	1	OUT OF STATE
	M	7	1	OUT OF STATE
	M	6	1	OUT OF STATE
	M	2	1	OUT OF STATE
	F	0	1	PRINCE GEORGE'S
VIBRIO PARAHAEMOLYTICUS				
	F	73	1	BALTIMORE CITY
TOTAL			**116**	

ISOLATES - REFERENCE

GENUS SPECIES	SOURCE	#	JURISDICTION
ACINETOBACTER CALCOACETICUS-ACINETOBACTER BAUMANNI COMPLEX			
	URINE	1	WICOMICO
	WOUND	1	WICOMICO
ENTEROCOCCUS FAECIUM			
	URINE	2	WICOMICO
ESCHERICHIA COLI			
	URINE	1	WICOMICO
KLEBSIELLA PNEUMONIAE			
	UNKNOWN	1	CARROLL
	UNKNOWN	1	PRINCE GEORGE'S
STAPHYLOCOCCUS AUREUS			
	BLOOD	1	WICOMICO
TOTAL		**8**	

ISOLATES - MISCELLANEOUS

GENUS SPECIES / SOURCE	#	JURISDICTION
CLOSTRIDIUM SEPTICUM		
BLOOD	1	BALTIMORE CITY
ENTEROBACTER CLOACAE		
BLOOD	1	BALTIMORE CITY
ENTEROCOCCUS FAECALIS		
WOUND	3	FREDERICK
ESCHERICHIA COLI		
BLOOD	1	BALTIMORE CITY
WOUND	1	MONTGOMERY
UNKNOWN	1	PRINCE GEORGE'S
VAGINAL	1	PRINCE GEORGE'S
GARDNERELLA VAGINALIS		
VAGINAL	1	CECIL
VAGINAL	2	PRINCE GEORGE'S
VAGINAL	2	PRINCE GEORGE'S
VAGINAL	5	SOMERSET
KLEBSIELLA PNEUMONIAE		
UNKNOWN	1	PRINCE GEORGE'S
PROTEUS MIRABILIS		
EAR	1	BALTIMORE CITY
TUBE SITE	1	CARROLL
SERRATIA MARCESCENS		
WOUND	2	FREDERICK
STAPHYLOCOCCUS AUREUS		
ABDOMINAL	1	BALTIMORE CITY
BLOOD	3	BALTIMORE CITY
SKIN	2	BALTIMORE CITY
SPUTUM	1	BALTIMORE CITY
VAGINAL	1	BALTIMORE CITY
WOUND	2	BALTIMORE CITY
BOIL	1	CARROLL
BOIL	1	CARROLL
NASAL	1	CARROLL
VAGINAL	1	CECIL
OTHER	1	FREDERICK
VAGINAL	1	FREDERICK
WOUND	6	FREDERICK
WOUND	1	PRINCE GEORGE'S
VAGINAL	2	SOMERSET
STAPHYLOCOCCUS, COAGULASE NEGATIVE		
BLOOD	3	BALTIMORE CITY
LIP	1	BALTIMORE CITY
ABSCESS	1	BALTIMORE CITY
WOUND	1	BALTIMORE CITY
WOUND	2	CARROLL
ULCER	1	FREDERICK
WOUND	4	FREDERICK
STREPTOCOCCUS, ALPHA-HEMOLYTIC		
BLOOD	1	BALTIMORE CITY
STREPTOCOCCUS, BETA HEMOLYTIC, GROUP B		
VAGINAL	2	ANNE ARUNDEL
VAGINAL	2	HOWARD
VAGINAL	3	PRINCE GEORGE'S
VAGINAL	3	PRINCE GEORGE'S
VAGINAL	1	SOMERSET
VAGINAL	1	SOMERSET

TOTAL 75

SEXUALLY TRANSMITTED DISEASES

GENUS SPECIES / SEX	#	JURISDICTION
SYPHILIS SEROLOGY		
F	2	ALLEGANY
F	1	ANNE ARUNDEL
M	3	ANNE ARUNDEL
F	6	BALTIMORE
M	2	BALTIMORE
F	10	BALTIMORE CITY
M	19	BALTIMORE CITY
U	2	BALTIMORE CITY
M	2	CHARLES
M	1	DORCHESTER
F	2	FREDERICK
M	1	FREDERICK
F	5	MONTGOMERY
M	4	MONTGOMERY
F	8	PRINCE GEORGE'S
M	22	PRINCE GEORGE'S
F	1	QUEEN ANNE'S
M	1	QUEEN ANNE'S
F	2	WASHINGTON
F	5	WICOMICO
M	2	WICOMICO
U	1	WICOMICO
F	1	WORCESTER

TOTAL 103

CHLAMYDIA TRACHOMATIS		
F	5	ALLEGANY
M	8	ALLEGANY
U	1	ALLEGANY
F	12	ANNE ARUNDEL
M	8	ANNE ARUNDEL
F	14	BALTIMORE
M	13	BALTIMORE
F	14	BALTIMORE CITY
M	33	BALTIMORE CITY
F	4	CALVERT
M	1	CALVERT
F	3	CARROLL
F	2	CECIL
F	5	CHARLES
F	8	FREDERICK
F	4	HARFORD
F	4	HOWARD
U	1	HOWARD
F	1	KENT
F	16	MONTGOMERY
M	2	MONTGOMERY
U	3	MONTGOMERY
F	49	PRINCE GEORGE'S
M	44	PRINCE GEORGE'S
F	2	SAINT MARY'S
F	5	SOMERSET
M	12	SOMERSET
F	4	TALBOT
M	2	TALBOT
F	4	WASHINGTON
F	11	WICOMICO
M	2	WICOMICO
F	1	WORCESTER
M	1	WORCESTER

TOTAL 299

NEISSERIA GONORRHEAE		
F	3	ALLEGANY
F	2	ANNE ARUNDEL
F	4	BALTIMORE
M	5	BALTIMORE
M	1	BALTIMORE CITY
F	1	CALVERT
M	1	CAROLINE
F	2	CHARLES
M	7	CHARLES
F	1	FREDERICK
M	2	FREDERICK
F	1	HARFORD
M	1	HARFORD
M	1	HOWARD
M	4	KENT
F	4	PRINCE GEORGE'S
M	19	PRINCE GEORGE'S
M	3	SAINT MARY'S
M	1	WASHINGTON CO
F	4	WICOMICO
M	14	WICOMICO
M	4	WORCESTER

TOTAL 85

PENICILLIN RESISTANT GONORRHEA

REPORTED QUARTERLY
NO REPORT THIS MONTH

MYCOBACTERIOLOGY

ISOLATE / SEX	AGE	#	JURISDICTION
AEROBIC ACTINOMYCETE			
M	83	1	CARROLL
MYCOBACTERIUM ABSCESSUS			
F	71	1	BALTIMORE
F	12	1	BALTIMORE CITY
F	66	1	BALTIMORE CITY
M	31	1	BALTIMORE CITY
M	52	3	BALTIMORE CITY
MYCOBACTERIUM AVIUM COMPLEX			
F	84	1	ANNE ARUNDEL
F	58	1	BALTIMORE
F	63	1	BALTIMORE
F	66	1	BALTIMORE
F	77	1	BALTIMORE
F	45	1	BALTIMORE CITY
M	26	1	BALTIMORE CITY
M	51	1	BALTIMORE CITY
M	87	1	CARROLL
F	81	1	FREDERICK
F	90	1	FREDERICK
F	93	1	FREDERICK
M	20	1	FREDERICK
M	69	2	FREDERICK
F	72	1	MONTGOMERY
M	22	1	MONTGOMERY
M	36	1	MONTGOMERY

F	70	4	PRINCE GEORGE'S
M	82	1	WICOMICO
M	85	1	WICOMICO
MYCOBACTERIUM CHELONAE			
F	63	1	BALTIMORE
MYCOBACTERIUM FORTUITUM			
M	20	1	HARFORD
F	65	2	MONTGOMERY
F	71	1	MONTGOMERY
F	72	2	MONTGOMERY
M	25	1	MONTGOMERY
M	40	1	MONTGOMERY
MYCOBACTERIUM FORTUITUM COMPLEX			
M	38	1	OUT OF STATE
MYCOBACTERIUM GORDONAE			
M	36	1	ALLEGANY
M	70	1	ANNE ARUNDEL
M	62	1	BALTIMORE
M	74	1	BALTIMORE
F	43	1	BALTIMORE CITY
F	33	1	MONTGOMERY
F	19	1	OUT OF STATE
M	23	1	OUT OF STATE
M	39	1	OUT OF STATE
F	65	1	PRINCE GEORGE'S
M	31	1	PRINCE GEORGE'S
M	34	1	PRINCE GEORGE'S
F	38	1	WASHINGTON
F	73	1	WICOMICO
MYCOBACTERIUM KANSASII			
M	65	1	BALTIMORE
M	79	3	BALTIMORE CITY
M	0	1	UNKNOWN
MYCOBACTERIUM MARINUM			
M	44	1	ANNE ARUNDEL
M	66	1	ANNE ARUNDEL
M	76	1	ANNE ARUNDEL
M	53	1	BALTIMORE
M	69	1	TALBOT
MYCOBACTERIUM MUCOGENICUM			
M	39	1	BALTIMORE CITY
MYCOBACTERIUM SZULGAI			
M	44	1	CECIL
MYCOBACTERIUM TUBERCULOSIS			
M	59	1	ANNE ARUNDEL
M	38	1	BALTIMORE
M	62	1	BALTIMORE
M	21	1	BALTIMORE CITY
M	80	1	BALTIMORE CITY
M	20	1	FREDERICK
U	38	1	MONTGOMERY
M	28	1	MONTGOMERY
F	18	1	OUT OF STATE
F	19	1	OUT OF STATE
F	25	1	OUT OF STATE
M	25	1	OUT OF STATE
M	44	1	OUT OF STATE
M	83	1	OUT OF STATE
M	34	1	PRINCE GEORGE'S
F	0	1	UNKNOWN
MYCOBACTERIUM TUBERCULOSIS COMPLEX			
M	59	1	ANNE ARUNDEL
M	54	1	BALTIMORE
M	62	3	BALTIMORE
M	25	1	BALTIMORE CITY
M	80	1	BALTIMORE CITY
M	78	1	HARFORD
F	27	1	MONTGOMERY
M	44	5	MONTGOMERY
M	48	1	MONTGOMERY
F	38	1	OUT OF STATE
F	52	1	OUT OF STATE
M	48	2	OUT OF STATE
M	68	1	OUT OF STATE
F	22	5	PRINCE GEORGE'S
F	27	4	PRINCE GEORGE'S
F	38	1	PRINCE GEORGE'S
M	23	2	PRINCE GEORGE'S
M	35	3	PRINCE GEORGE'S
M	68	2	PRINCE GEORGE'S
MYCOBACTERIUM XENOPI			
M	48	3	SOMERSET
F	45	1	WICOMICO
SCOTOCHROMOGENIC MYCOBACTERIA			
F	80	1	BALTIMORE
F	62	1	FREDERICK
M	75	1	WICOMICO

TOTAL 128

MYCOBACTERIUM SUSCEPTIBILITY RESULTS

20 ISOLATES IDENTIFIED

6 DRUG RESISTANT STRAINS FOUND

#	JURISDICTION	DRUG(S)
1	BALTIMORE	STREPTOMYCIN
2	MONTGOMERY	ISONIAZID
1[B]	PRINCE GEORGE'S	PYRAZINAMIDE
1[C]	PRINCE GEORGE'S	ISONIAZID, RIFAMPIN, RIFABUTIN
1	WICOMICO	ISONIAZID, STREPTOMYCIN, ETHAMBUTOL

[A] TWO ISOLATES FROM THE SAME PATIENT
[B] PROBABLE FOR M. BOVIS
[C] MEETS CASE DEFINITION OF MULTI-DRUG TUBERCULOSIS (MDRTB)

Mycobacterium tuberculosis complex consists of:
- *M. tuberculosis*
- *M. bovis*
- *M. bovis, BCG*
- *M. africanum*
- *M. microti*
- *M. canettii*

MYCOLOGY

ISOLATE SEX	AGE	#	JURISDICTION
ASPERGILLUS FLAVUS			
F	90	1	BALTIMORE CITY
M	64	1	BALTIMORE CITY
ASPERGILLUS FUMIGATUS			
F	72	1	ALLEGANY
F	0	1	ANNE ARUNDEL
F	90	1	BALTIMORE CITY
F	66	1	CALVERT
M	62	2	TALBOT
ASPERGILLUS NIGER			
F	37	2	ALLEGANY
M	65	1	ANNE ARUNDEL
F	58	1	BALTIMORE
M	62	1	BALTIMORE CITY
F	76	1	TALBOT
ASPERGILLUS OCHRACEUS			
F	43	1	ALLEGANY
ASPERGILLUS SPECIES			
F	84	1	ANNE ARUNDEL
M	0	1	ANNE ARUNDEL
ASPERGILLUS USTUS			
M	72	1	BALTIMORE
CANDIDA ALBICANS			
F	25	1	BALTIMORE
M	81	1	BALTIMORE
M	0	1	BALTIMORE CITY
M	56	1	BALTIMORE CITY
M	62	1	BALTIMORE CITY
M	63	1	BALTIMORE CITY
M	74	1	BALTIMORE CITY
M	82	1	BALTIMORE CITY
M	81	1	CALVERT
F	27	1	CECIL
F	29	1	MONTGOMERY
F	60	1	MONTGOMERY
F	71	1	MONTGOMERY
M	38	1	MONTGOMERY
M	61	1	MONTGOMERY
M	64	1	MONTGOMERY
M	68	1	MONTGOMERY
M	81	1	MONTGOMERY
F	16	1	PRINCE GEORGE'S
F	18	1	PRINCE GEORGE'S
F	19	2	PRINCE GEORGE'S
F	21	2	PRINCE GEORGE'S
F	22	2	PRINCE GEORGE'S
F	27	1	PRINCE GEORGE'S
F	37	1	PRINCE GEORGE'S
F	45	1	PRINCE GEORGE'S
F	55	1	PRINCE GEORGE'S
F	60	1	PRINCE GEORGE'S
F	67	1	PRINCE GEORGE'S
F	72	1	PRINCE GEORGE'S
F	79	1	PRINCE GEORGE'S
F	80	1	PRINCE GEORGE'S
M	26	1	PRINCE GEORGE'S
M	39	3	PRINCE GEORGE'S
M	50	2	PRINCE GEORGE'S
M	54	1	PRINCE GEORGE'S
M	61	1	PRINCE GEORGE'S
M	85	1	PRINCE GEORGE'S
F	18	3	SOMERSET
F	19	5	SOMERSET
F	20	1	SOMERSET
F	22	1	SOMERSET
M	22	1	SOMERSET
F	0	1	WICOMICO
CANDIDA GLABRATA			
M	58	1	BALTIMORE CITY
M	60	1	MONTGOMERY
CANDIDA PARAPSILOSIS			
M	62	1	BALTIMORE CITY
F	97	1	FREDERICK
F	49	1	PRINCE GEORGE'S
M	0	1	PRINCE GEORGE'S
M	50	2	PRINCE GEORGE'S

CANDIDA TROPICALIS			
M	82	1	BALTIMORE CITY
M	65	2	PRINCE GEORGE'S
U	85	1	PRINCE GEORGE'S
CHRYSOSPORIUM SPECIES			
F	0	1	ANNE ARUNDEL
CLADOSPORIUM SPECIES			
M	58	1	TALBOT
COCCIDIOIDES IMMITIS			
F	57	1	BALTIMORE CITY
GORDONIA-RHODOCOCCUS COMPLEX			
U	55	1	ANNE ARUNDEL
HISTOPLASMA CAPSULATUM			
F	40	1	BALTIMORE
MUCOR SPECIES			
U	45	1	BALTIMORE CITY
MYCELIA STERILIA			
M	58	1	TALBOT
NOCARDIA ASTEROIDES			
M	67	1	BALTIMORE CITY
NOCARDIA NOVA			
F	65	1	BALTIMORE CITY
F	68	1	CALVERT
PENICILLIUM SPECIES			
F	46	1	ALLEGANY
U	0	1	ANNE ARUNDEL
F	71	2	ANNE ARUNDEL
F	68	1	CALVERT
F	66	1	CHARLES
F	5	1	MONTGOMERY
M	64	1	PRINCE GEORGE'S
M	83	1	TALBOT
TRICHOPHYTON MENTAGROPHYTES			
M	75	1	CARROLL
TRICHOPHYTON RUBRUM			
U	44	1	ANNE ARUNDEL
F	57	1	BALTIMORE CITY
F	57	1	CARROLL
F	19	1	CHARLES
M	0	1	WICOMICO
TRICHOPHYTON TONSURANS			
F	3	1	BALTIMORE
M	5	1	BALTIMORE
M	50	1	BALTIMORE CITY
M	8	2	TALBOT
TOTAL	**261**		

PARASITOLOGY

GENUS/SPECIES	#	JURISDICTION
BLASTOCYSTIS HOMINIS		
	2	PRINCE GEORGE'S
	2	MONTGOMERY
	2	PRINCE GEORGE'S
	1	MONTGOMERY
	2	FREDERICK
	1	HOWARD
	1	PRINCE GEORGE'S
	4	HOWARD
	5	MONTGOMERY
	1	ANNE ARUNDEL
	2	BALTIMORE CITY
	1	PRINCE GEORGE'S
	1	PRINCE GEORGE'S
DIENTAMOEBA FRAGILIS		
	1	ANNE ARUNDEL
	1	PRINCE GEORGE'S
	1	MONTGOMERY
ENDOLIMAX NANA		
	2	PRINCE GEORGE'S
	1	FREDERICK
	2	MONTGOMERY
	1	ANNE ARUNDEL
	1	MONTGOMERY
	2	MONTGOMERY
ENTAMOEBA COLI		
	2	HOWARD
ENTAMOEBA HARTMANNI		
	3	MONTGOMERY
	1	CARROLL
ENTEROBIUS VERMICULARIS		
	1	WASHINGTON
	1	BALTIMORE CITY
GIARDIA LAMBLIA		
	2	MONTGOMERY
	1	HOWARD
HOOKWORM		
	9	MONTGOMERY
IODAMOEBA BÜTSCHLII		
	1	BALTIMORE CITY
	1	BALTIMORE CITY
PLASMODIUM FALCIPARUM		
	1	BALTIMORE CITY
TOTAL	**60**	

FOOD SAFETY & SECURITY

	TOTALS
FOOD	
SAMPLES	106
NOTABLE PATHOGENS:	
SALMONELLA SP.	6
CAMPYLOBACTER SP.	8
LISTERIA SP.	1
CRABMEAT	
SAMPLES	0
EXCEEDING STANDARDS[1]	0
NOTABLE PATHOGENS:	
SHELLFISH	
SAMPLES	0
EXCEEDING STANDARDS[2]	0
NOTABLE PATHOGENS:	
SHELLFISH GROWING WATERS	
SAMPLES	212
TOTAL SAMPLES	**318**
TOTAL STANDARDS EXCEEDED	**15**

STANDARDS

[1]CRABMEAT FRESH
ESCHERICHIA COLI AT < 36 MPN/100 GRAMS
STANDARD PLATE COUNT AT < 100

[2]SHELLFISH
FECAL COLIFORMS AT < 230 MPN/100 GRAMS
STANDARD PLATE COUNT AT < 500,000 PER GRAM

WATER MICROBIOLOGY

	# TESTED	# NON-COMPLIANT
COMMUNITY	45	12
NON-COMMUNITY	290	29
TOTAL	**335**	**41**

VIRUS ISOLATION

ISOLATE SEX	AGE	#	JURISDICTION
ADENOVIRUS			
F	0	1	MONTGOMERY
M	0	1	MONTGOMERY
M	3	1	MONTGOMERY
M	8	1	MONTGOMERY
F	5	1	MONTGOMERY
SUBTOTAL	**5**		
HERPES SIMPLEX VIRUS TYPE 1			
M	43	1	DORCHESTER
F	12	1	BALTIMORE CITY
F	21	1	BALTIMORE CITY
SUBTOTAL	**3**		
INFLUENZA A VIRUS			
F	1	1	BALTIMORE
M	45	1	CALVERT
F	14	1	CALVERT
M	18	1	CALVERT
M	34	1	CALVERT
F	0	1	CALVERT
F	30	1	CALVERT
F	3	1	CALVERT
F	51	1	MONTGOMERY
M	5	1	MONTGOMERY
F	0	1	MONTGOMERY
M	0	1	MONTGOMERY
M	31	1	MONTGOMERY
M	20	1	MONTGOMERY
F	0	1	SOMERSET
M	48	1	BALTIMORE CITY
F	1	1	BALTIMORE CITY
F	13	1	BALTIMORE CITY
M	2	1	BALTIMORE CITY
F	1	1	BALTIMORE CITY
M	22	1	BALTIMORE CITY
M	22	1	BALTIMORE CITY
SUBTOTAL	**22**		
INFLUENZA B VIRUS			
F	20	1	CALVERT
F	18	1	CALVERT
M	11	1	CALVERT
M	15	1	MONTGOMERY
M	16	1	MONTGOMERY
M	19	1	PRINCE GEORGE'S
F	21	1	PRINCE GEORGE'S
F	19	1	PRINCE GEORGE'S
F	17	1	TALBOT
M	37	1	BALTIMORE CITY
F	6	1	BALTIMORE CITY
M	19	1	BALTIMORE CITY
SUBTOTAL	**12**		

PARAINFLUENZA VIRUS 1

F	4	1	MONTGOMERY

SUBTOTAL 1

PARAINFLUENZA VIRUS 3

F	1	1	MONTGOMERY

SUBTOTAL 1

RESPIRATORY SYNCYTIAL VIRUS

M	0	1	MONTGOMERY
M	1	1	MONTGOMERY
U	0	1	MONTGOMERY

SUBTOTAL 3

RHINOVIRUS POSITIVE BY PCR

F	2	1	BALTIMORE

SUBTOTAL 1

TOTAL 48

VIRAL POLYMERASE CHAIN REACTION (PCR)

ISOLATE

SEX	AGE	#	JURISDICTION
HERPES SIMPLEX VIRUS TYPE 1			
F	18	1	ANNE ARUNDEL
F	20	1	ANNE ARUNDEL
F	32	1	BALTIMORE
F	18	2	BALTIMORE CITY
F	19	1	BALTIMORE CITY
F	20	3	BALTIMORE CITY
F	22	2	BALTIMORE CITY
M	24	1	BALTIMORE CITY
U	22	3	BALTIMORE CITY
F	24	1	CARROLL
F	25	1	CHARLES
F	17	1	GARRETT
F	25	1	HARFORD
F	19	2	PRINCE GEORGE'S
F	20	3	PRINCE GEORGE'S
F	21	3	PRINCE GEORGE'S
F	24	1	PRINCE GEORGE'S
F	47	1	PRINCE GEORGE'S
M	19	1	PRINCE GEORGE'S
M	32	1	PRINCE GEORGE'S
M	47	1	PRINCE GEORGE'S
U	0	1	WICOMICO
F	18	1	WICOMICO
F	26	1	WICOMICO
HERPES SIMPLEX VIRUS TYPE 2			
U	22	1	ANNE ARUNDEL
F	22	1	ANNE ARUNDEL
F	48	1	ANNE ARUNDEL
U	25	1	BALTIMORE
F	30	1	BALTIMORE
M	31	1	BALTIMORE
U	19	1	BALTIMORE CITY
U	21	1	BALTIMORE CITY
U	44	1	BALTIMORE CITY
F	0	1	BALTIMORE CITY
F	17	1	BALTIMORE CITY
F	20	2	BALTIMORE CITY
F	21	2	BALTIMORE CITY
F	22	1	BALTIMORE CITY
F	24	1	BALTIMORE CITY
F	26	1	BALTIMORE CITY
F	27	1	BALTIMORE CITY
F	29	1	BALTIMORE CITY
F	41	1	BALTIMORE CITY
F	44	1	BALTIMORE CITY
M	18	1	BALTIMORE CITY
M	19	1	BALTIMORE CITY
M	21	1	BALTIMORE CITY
M	22	1	BALTIMORE CITY
M	23	1	BALTIMORE CITY
M	26	1	BALTIMORE CITY
M	31	1	BALTIMORE CITY
M	47	1	BALTIMORE CITY
M	55	1	BALTIMORE CITY
M	21	1	CAROLINE
F	19	1	CHARLES
F	21	1	CHARLES
F	22	1	CHARLES
F	24	1	CHARLES
F	35	1	CHARLES
U	22	1	DORCHESTER
F	40	1	HARFORD
F	16	1	HOWARD
F	19	1	PRINCE GEORGE'S
F	22	2	PRINCE GEORGE'S
F	34	1	PRINCE GEORGE'S
M	23	1	PRINCE GEORGE'S
F	16	1	TALBOT
F	22	1	WASHINGTON
F	18	1	WICOMICO
F	23	1	WICOMICO
F	26	1	WICOMICO
M	46	1	WICOMICO
INFLUENZA B VIRUS			
F	10	1	BALTIMORE
F	12	1	BALTIMORE
F	18	2	BALTIMORE
F	19	1	BALTIMORE
F	20	1	BALTIMORE
F	21	1	BALTIMORE
M	1	1	BALTIMORE
M	10	1	BALTIMORE
M	20	1	BALTIMORE
M	21	2	BALTIMORE
M	0	1	BALTIMORE CITY
M	19	1	BALTIMORE CITY
F	1	1	CALVERT
M	11	1	CALVERT
M	6	1	CALVERT
F	0	1	MONTGOMERY
F	1	1	MONTGOMERY
F	13	2	MONTGOMERY
F	14	1	MONTGOMERY
F	16	1	MONTGOMERY
F	7	1	MONTGOMERY
F	9	1	MONTGOMERY
M	10	1	MONTGOMERY
M	11	1	MONTGOMERY
M	14	1	MONTGOMERY
M	17	1	MONTGOMERY
M	2	1	MONTGOMERY
M	5	1	MONTGOMERY
M	6	1	MONTGOMERY
M	13	1	OUT OF STATE
U	18	1	PRINCE GEORGE'S
U	21	1	PRINCE GEORGE'S
F	18	3	PRINCE GEORGE'S
F	19	10	PRINCE GEORGE'S
F	21	4	PRINCE GEORGE'S
F	24	1	PRINCE GEORGE'S
F	28	1	PRINCE GEORGE'S
M	18	5	PRINCE GEORGE'S
M	19	6	PRINCE GEORGE'S
M	20	4	PRINCE GEORGE'S
M	21	1	PRINCE GEORGE'S
M	22	1	PRINCE GEORGE'S
F	11	1	TALBOT
F	17	1	TALBOT
F	8	1	WORCESTER
M	12	1	WORCESTER
M	14	1	WORCESTER

TOTAL 249

VIRAL HEPATITIS

ORGANISM	# SPECIMENS	# POSITIVES	JURISDICTION
HEPATITIS B			
	57	2	ALLEGANY
	186	1	ANNE ARUNDEL
	52	1	BALTIMORE
	507	3	BALTIMORE CITY
	3	0	CALVERT
	8	0	CARROLL
	183	0	CECIL
	1	0	CHARLES
	56	0	FREDERICK
	16	0	GARRETT
	34	2	HARFORD
	32	0	HOWARD
	213	4	MONTGOMERY
	5	1	PRINCE GEORGE'S
	351	14	PRINCE GEORGE'S
	7	0	QUEEN ANNE'S
	1	0	SAINT MARY'S
	6	0	SOMERSET
	9	0	TALBOT
	28	0	WASHINGTON
	105	0	WICOMICO
	1	0	WORCESTER
SUBTOTAL			
	1,861	**28**	
HEPATITIS C			
	54	9	ALLEGANY
	212	53	ANNE ARUNDEL
	51	5	BALTIMORE
	270	70	BALTIMORE CITY
	4	0	CALVERT
	12	0	CARROLL
	103	16	CECIL
	1	0	CHARLES
	71	4	FREDERICK
	17	0	GARRETT
	22	2	HARFORD
	1	0	HOWARD

26	1	MONTGOMERY
5	2	PRINCE GEORGE'S
236	4	PRINCE GEORGE'S
36	1	QUEEN ANNE'S
2	0	SAINT MARY'S
3	0	SOMERSET
7	0	TALBOT
5	0	WASHINGTON
19	1	WICOMICO
1	1	WORCESTER
SUBTOTAL		
1,158	**169**	
TOTALS		
3,019	**197**	

RABIES

SOURCE	#	JURISDICTION
CAT	1	CECIL
	1	FREDERICK
	1	WASHINGTON
RACCOON	2	BALTIMORE
	1	BALTIMORE CTY
	1	FREDERICK
	6	MONTGOMERY
	2	TALBOT
	1	WICOMICO
TOTAL POSITIVES	**16**	
TOTAL SPECIMENS	**239**	

CHLAMYDIOPHILIA PSITTACI
(CHLAMYDIA)

REPORTED QUARTERLY
NO REPORT THIS MONTH

CD4 FLOW CYTOMETRY WORKLOAD

REPORTED QUARTERLY
NO REPORT THIS MONTH

BLOOD LEAD

MARYLAND

I	<10	108
IIA	10-14	6
IIB	15-19	6
III	20-44	5
IV	45-69	0
V	>69	0
TOTAL		**125**

WASHINGTON DC

I	<10	0
IIA	10-14	1
IIB	15-19	0
III	20-44	0
IV	45-69	0
V	>69	0
TOTAL		**1**

NEWBORN & CHILDHOOD SCREENING

STATISTICS FOR FEBRUARY 2009

PRESUMPTIVE POSITIVES

DISORDERS	#
PHENYLKETONURIA	2
MAPLE SYRUP URINE DISEASE	2
HOMOCYSTINURIA	9
TYROSINEMIA	8
ARGININEMIA	0
CITRULLINEMIA	0
GALACTOSEMIA	2
BIOTINIDASE DEFICIENCY	1
HYPOTHYROIDISM	60
HEMOGLOBIN -DISEASE	14
HEMOGLOBIN -BENIGN	487
CONGENITAL ADRENAL HYPERPLASIA (CAH)	72
CYSTIC FIBROSIS	2
FATTY ACID OXIDATIONS	4
ORGANIC ACIDEMIAS	6
ACYLCARNITINE - BORDERLINE	0
ACYLCARNITINE - OTHERS	0

MONTHLY TOTALS

# OF SPECIMENS SCREENED	11,756
NUMBER OF TESTS	831,499
% UNSATISFACTORY SPECIMENS	2.8

YEAR-TO-DATE CONFIRMED CASES

CONDITIONS	# CONFIRMED
MCAD	0
3MCC	0
SCAD	0
VLCAD	0
GA-I	0
IVA	0
PA	0
MAPLE SYRUP URINE DISEASE	0
PKU- CLINICALLY SIGNIFICANT VARIANT	0
CLINICALLY SIGNIFICANT VARIANT HYPERPHENYLALANINEMIA (NOT CLASSICAL PKU)	0
VARIANT HYPERPHENYLALANINEMIA (NOT CLINICALLY SIGNIFICANT)	0
CITRULINEMIA I (CIT-I)	0
GALACTOSEMIA- CLASSICAL GALT DEFICIENCY	0
GALACTOSEMIA - VARIANT	0
BIOTINIDASE DEFICIENCY	0
GALACTOSE EPIMERASE DEFICIENCY	0
PARTIAL BIOTINIDASE DEFICIENCY	0
CAH- CLASSICAL SALT WASTING	0
CAH-NON-CLASSICAL	0
HYPOTHYROIDISM - PRIMARY	4
OTHER HYPOTHYROIDISM	0
SECONFARY HYPOTHYROIDISM	0
SICKLE CELL DISEASE -SS	0
SICKLE CELL DISEASE -SC	0
SICKLE CELL DISEASE -SE	0
SICKLE CELL DISEASE -S BETA THALASSEMIA	0
CYSTIC FIBROSIS	1

ENVIRONMENTAL CHEMISTRY

SAMPLES	# NON-COMPLIANT	# TESTED
ASBESTOS		
AIR	0	0
BULK	0	1
AIR QUALITY		
$PM_{2.5}$	0	467
PM_{10}	0	0
RADIATION		
AIR/CHARCOAL FILTERS	0	64
MILK	0	0
WIPES	0	37
RAW WATER	0	5
VEGETATION	0	0
OTHER	0	0
DRINKING WATER		
METALS		
COMMUNITY	11	17
NON-COMMUNITY	3	9
PRIVATE WELLS	27	169
PESTICIDES & PCBs		
COMMUNITY	0	56
NON-COMMUNITY	0	8
PRIVATE WELLS	0	0
VOLATILE ORGANIC COMPOUNDS		
COMMUNITY	1	185
NON-COMMUNITY	0	63
PRIVATE WELLS	3	155
RADIATION		
COMMUNITY	0	0
NON-COMMUNITY	8	42
PRIVATE WELLS	5	5
INORGANICS		
COMMUNITY	0	15
NON-COMMUNITY	6	175
PRIVATE WELLS	7	206
FOOD CHEMISTRY		
SUSPECTED TAMPERING	0	0
MICROSCOPIC FILTH	0	0
LABELING	0	0
SURVEILLANCE	0	0
CHEMICAL CONTAMINATION	0	0
TOTAL	**71**	**1,679**

VIRAL LOAD SPECIMENS

HIV-1 RNA COPIES/ML	$<10^3$	10^3—10^4	10^4—10^5	$>10^5$	TOTALS
ALLEGANY	13	3	3	0	**19**
CARROLL	0	1	1	0	**2**
CHARLES	0	0	1	0	**1**
FREDERICK	1	1	1	0	**3**
MONTGOMERY	75	13	13	7	**108**
PRINCE GEORGE'S	81	20	12	7	**120**
QUEEN ANNE'S	0	0	0	1	**1**
WASHINGTON	5	0	1	0	**6**
WICOMICO	2	0	0	0	**2**
SUBTOTALS	177	38	32	15	**262**
DEPT. OF CORRECTIONS	47	12	17	3	**79**
TOTALS	**224**	**50**	**49**	**18**	**341**

HIV ANTIBODY SCREENING

SUBMITTER	TOTAL SPECI-MENS	# EIA POSITIVE	% EIA POSITIVE	# WB POSITIVE	% WB POSITIVE
CORRECTIONAL INSTITUTIONS	133	2	1.50%	1	50.00%
FAMILY PLANNING (NON-GOVERNMENT)	71	1	1.41%	1	100.00%
HEALTH CENTERS (NON-GOVERNMENT)	614	54	8.79%	50	92.59%
HEALTH DEPT, NON-STD, FAMILY PLANNING	468	2	0.43%	1	50.00%
HEALTH DEPT, NON-STD, OB/GYN	4	0	0.00%	0	0.00%
HEALTH DEPT, NON-STD, OTHER	693	49	7.07%	44	89.80%
HEALTH DEPT, STD CLINICS	819	8	0.98%	8	100.00%
HOSPITAL, OTHER	137	9	6.57%	9	100.00%
HOSPITAL, PUBLIC	14	0	0.00%	0	0.00%
LABORATORIES (NON-HOSPITAL)	362	15	4.14%	10	66.67%
PEDIATRIC - CHILD HEALTH	3	0	0.00%	0	0.00%
PRIVATE PHYSICIANS	10	0	0.00%	0	0.00%
PRIVATE STUDENT HEALTH CENTERS	45	0	0.00%	0	0.00%
PUBLIC STUDENT HEALTH CENTERS	266	2	0.75%	0	0.00%
TOTALS	**3,639**	**142**	**3.90%**	**124**	**87.32%**

MAILING LABEL

Critical Link
c/o Georgia Corso, Room L-15
J. Mehsen Joseph Public Health Laboratory
Department of Health & Mental Hygiene
201 West Preston Street
Baltimore, Maryland 21201