We’d Like to Hear from You

The vast majority of feature articles that appear in our Infectious Disease Update come about because somebody asked for them.

Often at meetings or during informal conversations, somebody will say: “Why don’t you write something about this particular subject?” Invariably, if it’s important enough for one person to be interested in it, then there’s an excellent chance that additional readers would like to hear about that subject.

Additionally, you might come across an article in a journal that you feel should be brought to the attention of other professionals. Just let us know the name of the journal, the volume, the month, and the page and we’ll try to include it in a forthcoming issue.

To contact the Editor, just click here.

Acinetobacter Infections

Overview of Genus

Members of this genus are nonmotile, Gram-negative rods that are very strongly bipolar staining. When observed in a Gram stain, they usually appear as Gram-negative diplococci.

William F. Vincent, Ph.D.
Senior Editor

Gram stain of Acinetobacter baumannii, the most common isolate from this genus. Note the bipolar staining of the cells giving the illusion of a Gram-negative diplococcus

Courtesy of CDC
The Genus, Continued

The Acinetobacter are important soil microorganisms and play a key role in the mineralization of aromatic compounds there.

Modern molecular-based taxonomic methods have demonstrated that there are at least 33 different genomic groups of which 18 have genomic names. In addition, there are another 28 groups identified that have multiple strains. Of all the species and strains, however, Acinetobacter baumannii is by far the most important human pathogen.

The Natural Habitat

The Acinetobacter are widely distributed in nature and are found in soil, water, on the skin, etc. A particularly common place to isolate them is under the armpits and in the groin area. They are able to survive on various surfaces (both moist and dry) for extended periods of time. One study showed that hundreds of colonies could be grown from an everyday kitchen sponge.

The Acinetobacter can also be isolated from foodstuffs, especially those grown in the soil.

The Nomenclature of the Acinetobacter

In 1960 (that's over 50 years ago), this writer first encountered Acinetobacter in an "unknown" specimen that was distributed as part of an advanced microbiology course. I wracked my brain for several days trying to identify this little guy. Finally, I came up with the identification of Bacterium anitratum and was correct. A couple of decades later, the name was changed to Herellea vaginacola. Then it was changed to Acinetobacter calcoaceticus var. anitratus (try saying that fast three times) and more recently to Acinetobacter baumannii. What was a rarely encountered isolate with a virtually unknown role in terms of pathogenicity and virulence when first encountered by the writer is today a well known one with an important clinical role as a nosocomial pathogen.

The Acinetobacter as Significant Pathogens

Members of the genus Acinetobacter are now recognized as significant nosocomial pathogens. They can persist in the hospital environment and often cause severe, life-threatening infections in critically ill and compromised patients.

The Acinetobacter have the ability to form "biofilms" which are composed of polysaccharide materials. These films are quite impenetrable (especially by antimicrobial agents) and can be found on many medical devices (catheters, trachs, etc.).

Example of a biofilm. These are bacteria grown in a biofilm on a contact lens

Courtesy of the American Society for Microbiology
Infections caused by *Acinetobacter* include:

- Ventilator-associated pneumonia (VAP)
- Urinary tract infections
- Bloodstream infection
- Skin and wound infections (especially postsurgical and traumatic such as battlefield wounds)
- Secondary meningitis
- Endocarditis
- CAPD-associated peritonitis
- Ventriculitis

The *Acinetobacter* are particularly important on ventilator units where they represent 5 to 25% of all cases of VAP. In this setting, the risk factors include:

- Chronic lung disease
- Immunosuppression
- Age
- Surgery
- The use of antibiotics
- Invasive devices
- Prolonged stay in an ICU or ventilator unit

**The Acinetobacter during the Iraq War**

Since the start of the Second Iraq War, over 700 American service persons have become infected or colonized with *Acinetobacter baumannii*. As a result of this, the organism got the nickname "Iraqobacter".

We now know that these infections didn't occur on the battlefield but were the result of their hospitalization in certain hospitals in Germany where infection control practices appeared not to be adequate.

**Acinetobacter as An Emerging Pathogen**

*Acinetobacter* has emerged as a global, nosocomial pathogen. It is often difficult, however, to distinguish between its role as a pathogen and its role as a mere colonizer or commensal. When the organism is isolated from blood and other normally sterile sites, its role as a pathogen is quite clear.

Additionally, *Acinetobacter* is also considered a newly emerging multidrug-resistant organism (MDRO). Since the 1970s, the spread of MDR- *Acinetobacter* strains among critically ill, hospitalized patients has become an increasing cause of concern.

**Antimicrobial Therapy**

The *Acinetobacter* are inherently resistant to many classes of antibiotics including:

- Penicillins (including ampicillin and amoxicillin)
- Chloramphenicol
- Aminoglycosides
- Fluoroquinolones

In recent years, there has been a dramatic increase in the drug-resistant isolates encountered and this has been of great concern to infectious disease specialists and epidemiologists. Presently, the carbapenems are recognized as the "gold" standard as well as the treatment of last resort. The carbapenems presently available in the U.S. are:

- Imipenem - actually imipenem plus cilastatin
- Meropenem
- Ertapenem

Unfortunately, increasing resistance to the carbapenems is making MDR-*Acinetobacter* infections very difficult, if not impossible to treat. Other possible drugs that can be considered are polymyxin, tigecycline, sulbactam combinations, rifampicin/amikacin combinations and the aminoglycosides. There are synthetic peptides in development that may be useful.

**Infection Control Measures**

One must bear in mind, when formulating effective infection control practices, that these organisms can live on the skin and may survive in the hospital or nursing home environment for several days even under relatively warm and dry conditions. It has been demonstrated that these organisms can survive in dry particles and dust for up to 10 days.

The following general measures should be considered as part of an effective program:

- Effective hand hygiene practices
- Contact precautions
- Environmental decontamination with an effective agent (check the insert with your product to make sure that it inactivates these organisms)
- Prudent use of antibiotics
- Avoidance of transfer of patients from ICUs to burn units

William F. Vincent, Ph.D.
Quest Diagnostics
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**Selected References**


Centers for Disease Control and Prevention. 2010. *Acinetobacter* in healthcare settings. Click here to access website.

Force Health Protection and Readiness. 2010. *Acinetobacter.* Click here to access website.


Sunenshine, R.H. et al. 2007. Multidrug-resistant *Acinetobacter* mortality rate and length of hospitalization. *Emerging Infectious Diseases* 13: 97-103. Click here to access complete article.

Other Infectious Disease News

About one out of 10 parents ignore Child's Vaccine Schedules

Researchers at the University of Michigan found that 13 % of parents or guardians varied in some way from the vaccine recommendations for children by CDC. That 13 % was broken down as follows:

- 55 % of parents delayed the vaccines until the child was older than the recommended age
- 53 % refused only certain vaccines
- 36 % extended intervals between vaccine doses
- 22 % received each component of the measles, mumps, and rubella (MMR) vaccine separately,
- 17 % of the group (2 % of the entire group studied) refused all vaccines for their children

In the case of the vaccines that were refused, the H1N1 monovalent vaccine ("swine" flu) was the most common (86 %).

The biggest reason that parents failed to follow the schedule was the lack of a regular healthcare provider for the child. Many of these parents would actually like to have their children receive the vaccines (and receive them on time) but have difficulty accessing medical care. There was a significant group of parents who felt that using an alternate schedule was best for their children.


Is Cholera Spreading in The U.S.?

Researchers at The Centers for Disease Control and Prevention (CDC) recently reported that since the cholera outbreak in Haiti (which started in October 2010), there have been 23 cases of cholera in the U.S. That is an increase of nearly four times what is normally reported in the U.S.

Of the 23 cases, 22 of them had traveled to Haiti and/or to the Dominican Republic. That leaves only one case associated with a person who had not left the continental U.S.


Feces on Your Cell Phone?

Researchers at the London School of Hygiene and Tropical Medicine checked 390 cell phones in 12 cities in

Free CME credits

Reducing the burden of *Clostridium difficile* infection (CDI) Spotlight on populations-at-risk. Free CME offering from Infectious Disease News. Click here to access offering.

Efficacy tied to Tigecycline Mortality Risk. Free CME offering from MedPage Today. Click here to access offering.

Malaria vaccine cuts risk of disease in children. Free CME offering from MedPage Today. Click here to access offering.

Early HIV therapy in patients with TB saves lives. Free CME offering from MedPage Today. Click here to access offering.

Good example of how cholera can spread

Courtesy of CDC
the U.K. and came up with some startling results which are shown on the next page.

- 92% of the phones cultured had significant numbers of bacteria on them
- 16% of the phones had Escherichia coli on them

Their conclusion was that a lot of people in the U.K. (and presumably other countries) don’t wash their hands thoroughly after using the toilet.

Contamination of mobile phones and hands revealed for Global Handwashing Day. Click [here](#) to access the article on the website of the London School of Hygiene and Tropical Medicine.

**Bacteria that might be related to Pancreatic Cancer**

Researchers at David Geffen School of Medicine at UCLA recently found that two microorganisms found in saliva might have a relationship with pancreatic cancer.

They found that the levels of *Neisseria elongata* and *Streptococcus mitis* together might be a marker when patients with pancreatic cancer were compared to control subjects.

The researchers stated that additional studies are needed to determine whether or not these organisms actually have a role in carcinogenesis.


**New Drug for Influenza being Tested**

Recently researchers at the University of Pennsylvania School of Medicine tested a new drug called “DAS181” which targets host cell factors responsible for influenza infection. DAS181 is a fusion protein and is administered by inhalation. When administered once-a-day for three days, the drug reduces the viral load by more than 100-fold.

The result of the studies, which were carried out over three influenza seasons in both hemispheres, was reported at the recent meeting of the Interscience Conference on Antimicrobial Agents and Chemotherapy in September in Chicago.


**Superbugs escaping through Our Sewers**

Researchers at the Federal University of Saõ Paulo in Brazil checked the sewage effluent from their medical center to determine the extent and types of drug-resistant organisms that were present.

![Colonies of *Klebsiella pneumoniae* growing on MacConkey agar.](#) Note the mucous appearance of the colonies which is distinctive for this organism. Courtesy of CDC

They found 21 organisms that contained the *Klebsiella pneumoniae* carbapenemase gene technically known as *blaKPC-2*.

This gene codes for an enzyme called “carbapenemase” which breaks down the carbapenem antibiotics.
(imipenem, meropenem, etc.). The bottom line is that these organisms are incredibly difficult to treat. Included among the resistant isolates were Aeromonas, Serratia, Klebsiella, Raoultella, Klyuvera, Enterobacter and Citrobacter.

The authors are worried that these organisms could persist in the environment and act as agents for the development of resistance in the wider community.

Of interest, two of the isolates, Klyuvera and Aeromonas are generally considered nonpathogenic environmental bacteria. This statement was made by the authors of this study but has not been the Editor's experience. He has encountered Klyuvera as the only isolate from patients with symptomatic UTIs strongly suggesting that it is indeed a pathogen. In the case of Aeromonas hydrophila, this organism is now recognized as an occasional cause of gastroenteritis as well as wound infections..

Unknown Viruses found in Sewage
There are (probably) literally millions of different viruses on our planet but to date, only about 3,000 have been identified.

Researchers at the University of Pittsburgh, Washington University (St. Louis) and the University of Barcelona teamed up to study viruses in sewage from North America, Europe and Africa.

It shouldn't come as any surprise that they found literally thousands of different viruses. They were able to identify the genetic signatures for 234 viruses that are already known. These included a number of human pathogens such as Human Papillomavirus (HPV) and Norovirus (the cause of "winter diarrhea").

What really startled them was the huge number of genetic signatures of viruses never previously described (several thousand).

Cantalupo, P.G. et al. 2011. Raw sewage harbors diverse viral populations. mBio (online journal). Click here to access the entire article.

Staphylococcus aureus Isolates with Intermediate Resistance to Vancomycin
The drug-of-choice for treating most methicillin-resistant Staphylococcus aureus (MRSA) has been vancomycin.

The worry has always been the emergence of vancomycin-resistant strains of S. aureus (VRSA)) which would certainly confound antimicrobial therapy. So far, roughly a dozen cases of VRSA isolates have been reported to CDC.

In a recent study, investigators from a number of institutions examined 4,210 S. aureus isolates from clinically significant infections. Out of these, they found 11 isolates that had intermediate resistance to vancomycin (VISA). These isolates did not appear to be related to each other.

The appearance of VISA among S. aureus isolates, however small, does not bode well for the future.


Does The Use of Antimicrobial Soaps Lead to Antibiotic Resistance?
Researchers looked at 70 subjects in each of the following categories:

1) Those who frequently used bath and shower products containing triclosan (antibacterial)
2) Those who frequently used soap bars containing triclosan
3) Those who never used any of these products

They cultured the forearms of these subjects and isolated specimens of *Staphylococcus aureus*. They then tested these isolates against a number of antimicrobial drugs conventionally used to treat it. Their conclusion was that there was no statistically significant difference between the three groups. This would immediately suggest that earlier studies (over the last 15 years) on this topic were in error. Frankly, we find that terribly hard to believe. First of all, we’ve never heard of this journal before and when we finally found its website, we noted that there was a $1,000 fee to publish. The article review states that the *International Journal of Microbiology Research* is a “peer-reviewed” journal. Despite much search, we couldn’t find the names of any of the reviewers. This research was supported by the American Cleaning Institute (ACT) and the Personal Care Products Council.

There is a website, *Physorg.com*, which reviews many papers and allows for persons to leave comments concerning them. We suggest that readers access that site and look at the comments left by other readers about this piece of research.


**Unusual Microorganisms**

The Genus *Raoultella*

Members of this genus were formerly included in the genus *Klebsiella* but were placed in this genus in 2001. These are usually considered to be water and soil inhabitants but occasionally they are associated with human disease. *Raouletta planticola* has been associated with one case of pancreatitis and *Raoultella ornithinolytica* has been associated with enteric fevers.


**Actinobaculum Infections**

**Question:** I have heard that this organism can cause urinary tract infections. What is it?

**Answer:** This organism is an anaerobic, gram-positive rod that indeed can cause urinary tract infections especially in the elderly with pre-existing urinary problems. Its role and prevalence as a pathogen, however, is not clearly known since we don’t perform anaerobic cultures on urine specimens. There have been numerous occasions where it has been isolated from the blood of patients with probable urinary tract infections.

Banks, S. et al. 2010. *Actinobaculum schaallii*, a common uropathogen in elderly patients, Denmark. *Emerging Infectious Diseases* 16. 76-80. Click here to access complete article.


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The Rock of Ages Company in Barre, Vermont is world known for its grave stones carved on beautiful Vermont grey marble. We had an opportunity to visit their factory and found the whole operation extremely fascinating. What was almost as fascinating, however, was the cemetery in Barre where many of the skilled masons and carvers who worked at Rock of Ages are buried. It seems that when a fellow worker passes away, his fellow workers get together and carve him or her a really fantastic grave marker. These stones are pieces of art that I have never seen in any other grave yard (at least here in New England).

This grave maker is absolutely my favorite. The head stone pictures a husband and wife in bed holding hands. The caption reads "Set me as a seal upon thine for love is strong as death".

The person buried here was a stock car racer. The stone even has the number of his car ("61"). I walked around this monument several times and the detail was incredible.
The deceased here was an ardent soccer fan and had his grave marker decorated with a soccer ball. This stone adorns the grave of a First World War veteran.

The deceased, an early 20th century gentleman with a lovely handlebar mustache, looks like he's contemplating the world he just left. Many of the master carvers were immigrants from Italy including Mr. Eliacorti pictured here. This hunk of grey Barre marble used here would have cost a fortune.