

May 2009

Monthly Newsletter

This is the sixth installment of our newsletter. Here we discuss our new Master Mix for better DNA results, cash flow management, and the second installment in the Kingdom of Fungi.

-Edward A. Sobek, Ph.D., President/Lab Director

Always Looking for the Best Possible Results

By Merissa McGraw

At Assured Bio it is our goal to ensure the data the client receives is the best possible. That is why we are currently recalibrating our ERMI assays with a new Master Mix. This new Master Mix gives our assays an advantage over prior Master Mixes. This advantage increases the specificity which in turn gives you a more accurate quantification of mold species within the ERMI panel.

As some of you may know the ERMI is based on the Polymerase Chain Reaction, or PCR for short. DNA polymerase is what is responsible for duplicating the DNA present in your dust samples. When your sample arrives it is put through a series of processes with the end result being the release of the mold template DNA. As you can guess, this template DNA provides the necessary information to the DNA polymerase in order to amplify the target sequence. Once enough DNA has been replicated a fluorescent signal is emitted that is detected by the Light Cycler. The cycle number in which the signal crosses the threshold dictates the concentration of mold spores within the sample. This is where the new Master Mix comes into play.

What is different about this Master Mix? The new Master Mix contains a mixture of monoclonal antibodies that bind to the polymerase and keep it inactive until the denaturation cycle of the PCR reaction. This is done instantaneously by increasing the reaction temperature to 95°C. Once the antibodies are re-

leased they no longer have the ability to rebind to the polymerase as the reaction temperature is lowered. This is important because the antibodies cannot impede the polymerase from elongating the new DNA strands. It is also important that the denaturation step is instantaneous because less DNA polymerase is lost. Before this new technology the denaturation step could take up to fifteen minutes. Holding the very heat sensitive polymerase at a high temperature for that amount of time caused a decrease in DNA recovery. With this type of guard protecting the DNA polymerase the data is much more accurate.

Another advantage of this Master Mix is the ability to decipher between homologous sequences. This means cross-reactivity is reduced. A lower cross-reactivity rate is important because you do not want to amplify DNA that is not the template or target sequence. The Light Cycler only reads the fluorescent light emitted and not the sequence of DNA. By reducing the likelihood of foreign DNA being amplified reduces the likelihood of the data being skewed due to this phenomenon. This is how the new Master Mix will allow higher specificity of our assays.

When new technology is introduced, Assured Bio will always be at the forefront determining how we can make our testing procedures the best possible. As always please do not hesitate to contact me with any questions. mmcgraw@assuredbio.com

Always Looking for the Best

-Merissa McGraw

Cash is King

-Brad Russell

The Basidiomycetes

-Lyn Pope



Cash is King

By Brad Russell

It happens all the time to people running small businesses. "My income statement says I'm making money, but my bank account is shrinking. Where is all the money going?" It can be especially frustrating when the company is growing quickly, yet the money still seems to disappear.

Fortunately, it is unlikely that your money is being stolen or there is an error somewhere in the calculations, although you should check for that first. Most likely the issue results from Cash Flow management and how money flows in and out of your business. We all know the story – "My suppliers demand immediate payment but I can't get money from my clients for some time. If I ask them for money sooner, they may go somewhere else."

If things stay constant, the above scenario may not be a big issue. But if business is growing and you have to spend money now while not collecting payments for some time, the cash balance of the company will dwindle. And in that scenario, the faster the company grows, the quicker it runs out of money. So what can you do to prevent or remedy this scenario?

The first thing to do is determine what is really going on by using a Cash Flow Statement. It's one of the 'Big 3' statements you should be familiar with. Your accountant or most any accounting software should be able to easily prepare this for you. The difference in a Cash

Flow Statement and Income Statement is that while Income Statements often record revenues on the day the sale is made, the Cash Flow Statement is only concerned with real dollars flowing in and out. Delayed payment and uncollectable accounts can affect this causing accounts receivable to grow faster than accounts payable.

The next thing to do is create a firm but fair credit policy and payment terms for your customers. Set a firm deadline in which payment is due and impose a penalty for payments not received by that date. If people don't have a penalty for not paying on time, they have little reason to do so. At the same time, reward paying customers with an early payment discount. Quick payment will help your cash flow issue.

Finally, manage your cash outflows. If you receive an invoice with terms of 'Net 30', meaning payment is due in 30 days, don't pay it immediately. Pay it toward the end of the payment period. Having that money for the extra month can be very beneficial. If you don't such terms, try to negotiate something with your suppliers. Also consider early payment discounts. If you have ample cash on hand, it is more beneficial to accept a discount of 1% or 2% for payment within ten days than it is to hold the money and pay at the end of 30 days.

Hopefully this gives you a few things to consider. Remember, a dollar in hand today is worth more than getting that dollar tomorrow. As your company grows, effectively managing cash is key to success and further growth.

**The Kingdom of Fungi:
The Basidiomycetes: Part 2 of 3**

By Lyn Pope

In the second installation discussing the kingdom of the fungi, let's turn our focus to the Basidiomycetes, which contains many of the most conspicuous fungi. In fact, the largest organism on Earth is not the Blue Whale or the redwood tree. It is the *Armarillia* (honey mushroom) in Michigan which is 1,500 years old, with an estimated weight of over 22,000 pounds. Another Basidiomycete was found to be the oldest organism on Earth. It is an underground root parasite in Oregon's Blue Mountains which is at least 2,400 years old and extends below 2,200 acres of conifer forest.

The phylum Basidiomycota includes organisms such as mushrooms, puffballs and shelf fungi. Other members are stink-horns, jelly fungi, boletes, chanterelles, earth stars, smuts, bunts, rusts, *Cryptococcus* (the human pathogenic yeast), and also *Agaricus bisporus* (the common mushroom served on a pizza pie). Basidiomycetes are most commonly found outdoors but can begin growing indoors under extreme conditions.

Last month we discussed that many Ascomycetes produce distinctive sac (or ascus) from which they derive their name. Basidiomycetes are filamentous fungi; many of which form a basidiocarp (or mushroom). Basidiomycetes also differ from the Ascomycetes in that many sexually reproduce using club-shaped meiospores. In April, we discovered that a group of Ascomycetes (called the mitosporous) asexually reproduce using mitosis as their mechanism. Most Basidiomycetes utilize meiosis as their primary means (asexual reproduction is very rare for them).

Some common Basidiomycetes that you may see on direct examination lab reports are pictured below.



Coprinus comatus



Ganoderma lucidum

Basidiomycetes can travel by means of wind, water, or by transfer via a third party. They are often found airborne. Although the presence of Basidiomycetes is usually no means for alarm in an air sample, be mindful that these spores, too, may cause allergic reactions in some individuals.

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