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PDA Letter

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In This Issue...

PDA℠
Parenteral Drug Association

Connecting People, Science and Regulation℠

Communication Key to a Healthy CMO-Client Relationship

Ian Elvins, Lonza Biologics Inc.

A good working relationship between a contract manufacturing organization (CMO) and a pharmaceutical/biopharmaceutical company is critical for the overall success of a long-term project. A successful relationship—like a good marriage—requires strategic compromise, trust, patience and open, honest communication.

Nothing encapsulates the difficulties of a relationship better than the play *I Love You, You're Perfect, Now Change*. The piece is a series of vignettes which chronicle the many hilarious ways that couples interact over the course of a relationship. While relishing this amusing show in Chicago last summer, I could not help seeing that the parallels between the human relationship and the CMO–client relationship were striking (sometimes painfully so!). As with any couple, the CMO–client relationship passes through a series of distinct phases: from the starry-eyed optimism of youth, through crises of mistrust and suspicion, to arrive eventually at the golden era of mutual trust and respect. This article aims to chart a path through this matrimonial minefield by identifying some of the likely problems and providing some suggestions about how to avoid them.

Strategic Compromise

One of the first problems a real-life couple faces, especially when they cohabitate, is accepting that their partner does things differently. This, too, can be one of the first problems in the CMO-client relationship.

The relationship between the two quality groups seems often to be much thornier than that between, for example, the manufacturing groups. The reasons are probably not hard to comprehend. Technical folks on both sides of the partnership generally enjoy the experience and challenges associated with technology transfer and welcome the chance to work with other like-minded individuals and the opportunity to "play" with new "toys."

Not so for quality groups. Understandably, it is oftentimes difficult for a client's quality group to share oversight responsibilities, and the temptation to retain full control is sometimes irresistible (although impractical). These groups are familiar with organizing quality within

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Past Leader Spotlight: Nathan Kirsch, PDA President 1965-1966

Bob Myers, PDA

To celebrate our 60th anniversary in 2006, each issue of the *PDA Letter* will feature a "Past Leader Spotlight," an opportunity for PDA to connect our current generation of leaders with their predecessors. Below is the first in this series.

I chose to conduct the first interview with **Nathan Kirsch**, PDA's President from 1965-66. I worked for Nathan at Schering-Plough in the 1970's, and he helped me get involved with sterile products, sterilization and validation. He also encouraged me to join PDA.

For the interview, I met Nathan at his residence in New York and asked him to explain why he got involved in PDA during the Association's early years, how the organization grew during his time, and where he thinks we are headed. I found his answers resonated with me and my belief that PDA plays a valuable role in advancing science in a constructive way, and that we help bring greater understanding between the industry and health authorities.

Myers: How did you get involved with PDA?

Kirsch: I got involved with the industry it seems as a matter of luck. I completed graduate school at the [University of] Illinois in 1942 and was looking for a job, when I saw an advertisement in an endocrinology magazine for a position at Schering, which had just been brought under the control of the Alien Property Custodian law. I interviewed with the company's Executive VP and VP of Research. I was one of the first persons selected and was needed at the company for my microbiology background. I was hired as head of production for sterile products.

I soon learned that the people actually making the product were not scientifically trained and did not know exactly what they were doing. With a background in food processing from Illinois, I believed the same science should be applied to the manufacture of sterile pharmaceuticals. In fact, at an early pharmaceutical meeting on quality control, I recall asking Schering's Chairman, following a long discussion on sterility testing, if the pharmaceutical industry should adopt the same science as the food industry and test only a very few units following sterilization. Once the mechanical settings are known then the product can be assured of sterility and the batch released by what has become known as "parametric release." His answer was, "you must be an engineer, since no microbiologist would agree to that for pharmaceuticals."

Bill Bucke [PDA President, 1958-1959] nominated me to the Board of Directors of PDA. At first I had to decline because, at that time, we at Schering were not allowed to join organizations such as PDA. Bucke called our CEO, Francis Brown, who then called me. Francis told me that I would run for the Board of Directors of PDA, and, if elected, I would always remember Schering was a first class operation when I opened my mouth, and I would have his full support.

Myers: What do you see as PDA's largest contribution to the industry?

Kirsch: That's almost like asking which of my kids I like best. PDA has made many contributions to the industry in the area of better pharmaceutical science, especially in the area of sterility assurance. In the 50's and 60's, the pharmaceutical industry was using techniques for sterilization that just didn't work. One technique was called tindyalization, which called for raising the temperature of a solution to 50-60°C for one hour and then cooling it. This was repeated three times, and the material was supposed to be sterilized. This, of course, does not sterilize.

This brings me to my most significant contribution to the industry. This was to get Irving Pflug [University of Minnesota] to put the sterilization course together. I told him that the industry needed a progressive sterilization program with a good validation approach. That goes back 30 years, and believe it or not, the PDA Board at the time was not 100% behind the idea, since some of the members thought we already knew enough about sterilization. I had several other discussions with Irving and convinced him of the need, and, of course, PDA has used his material ever since. After doing the training at Schering, it was offered by PDA, and we were overwhelmed with participants. He originally felt it would be a one-time effort in the mid-70's, but we always have new people coming into the industry, and the course is still needed and essential today. It is a good lesson for PDA—focus on the need of the industry, not what people want to talk about.

Myers: What direction do you see PDA going in the future?

Kirsch: I had a lot of involvement with the U.S. FDA while a member of PDA. We had a close relationship with FDA to the extent we ➤

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moved to a new sterile facility at Schering, and they were comfortable using the facility for training their people. They came to Schering a couple of times a year to get a better understanding of sterile manufacturing.

You need a positive relationship between FDA and industry. We (Schering) had a significant issue with gentamicin in Puerto Rico in the early 70's. I ended up going to Washington to discuss the issue in person. As a result of the good relationship with FDA, and being given the opportunity to explain our position scientifically, we were able to resolve the issue during themeeting. I asked to wait for the letter agreeing to our position from FDA, and I was able to leave with the problem resolved in writing. It took years to gain the trust to be able to reach an understanding.

One of the most important aspects of PDA is the Association's interest in trying to get people to talk in meetings about issues. The ability to ask speakers questions at meetings has been one of the great things about PDA. In the past, these questions and answers were published in our journal. Those discussions were generally better than the presentation.

Myers: At Schering, you were my mentor of sorts, encouraging me to work with Irving Plfug to develop the company's sterilization validation program as the first validation engineer. You then asked me to make a presentation on the subject at the 1978 PDA meeting in Chicago and later nominated me to run for the PDA Board in 1984. What do you think of a mentoring-program for PDA to get our newer members involved in our many activities?

Kirsch: My oldest grandson, who will be 24 in January, worked as an intern at a production company during the last years of high school and the first year in college. At 19, he was given the opportunity to direct and produce a golf program for television. His boss had developed the confidence to allow him to be completely responsible for the entire program, and there it was on television. Jeffrey was listed as the director and producer. What a great experience for him, and it was to the credit of his mentor. Today, our leaders in America are not usually able to allow their subordinates to add creativity. There are ways to coach subordinates to allow for them to input their creativity, and in that sense, I support the concept of mentoring.

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PDA Announces 2006 Board of Directors and Officers

2006 Board Represents Diverse Base of Global Leadership

PDA is pleased to announce its 2006 Board of Directors and Officers.

The newly elected Officers for 2006-2007 are: Chair, **Vincent Anicetti**, Genentech, Inc.; Chair-Elect, **John Shabushnig**, PhD, Pfizer Inc; and Secretary, **Lisa Skeens**, PhD, Baxter Healthcare Corporation. **Maik Jornitz**, Sartorius Corporation, has been appointed Treasurer. The 2004-2005 Chair, **Nikki Mehringer**, Eli Lilly and Company assumes the office of Immediate Past Chair.

Yoshihito Hashimoto, Chiyoda Corporation, was reelected as Director. Three newly elected Directors will join the PDA Board in 2006: **Steven Mendivil**, Amgen; **Amy Scott-Billman**, GlaxoSmithKline; and **Gail Sofer**, GE Healthcare. In addition, **Anders Vinther**, PhD, CMC Pharmaceuticals A/S, and **Stephen Bellis**, IVAX Pharmaceuticals UK, have been appointed Directors.

"We are extremely pleased and honored that these outstanding and accomplished individuals have joined the PDA Board of Directors," said **Robert Myers**, PDA President. "Each brings a proven record of leadership that will complement the capabilities of our current Board members. The scientific and geographic diversity of the new Officers and Directors reflects PDA's growth over the last decade and strengthens our position as a global association for pharmaceutical and biopharmaceutical professionals."

Outgoing members include Immediate Past Chair, **Floyd Benjamin**, Keystone Pharmaceuticals, Inc.; Secretary, **Stephanie Gray**, Pharmaceutical Strategies; Chair-Elect **Rich Levy** (see the *PDA Letter*, October 2005, page 8); and, **Georg Roessling**, PhD (see below).

"On behalf of PDA, I would like to recognize the leadership and insight provided by our Board members over the last two years," said Mehringer. "The 2006 PDA Officers and Directors will continue to provide strong strategic guidance to ensure PDA remains dedicated to promoting scientifically sound and practical technical information and education for industry and regulatory agencies worldwide."

PDA Names Georg Roessling, PhD, Senior VP of PDA Europe

Georg Roessling, PhD, has joined PDA as Senior Vice President of PDA Europe, effective January 1, 2006.

"Under Dr. Roessling's leadership, PDA's European office will operate more independently of the Association's U.S. headquarters," said **Robert Myers**, PDA President. "This will bring superior service to our European membership and increased value to all of PDA."

Dr. Roessling is respected throughout the global pharmaceutical community and has a long history with PDA. He recently served as Treasurer of the Association's Board of Directors. He has a strong background in pharmaceutical science and manufacturing technology, gained through 21 years of product development experience. His managerial skills will strengthen PDA's overall operation in Europe.

Prior to joining PDA, Dr. Roessling worked at Schering AG, Berlin, Germany, where he most recently served as Head of the CMC Technology Office/Drug Delivery Systems. He formerly held positions in Pharmaceutical Development at Schering, including 13 years as Head of Parenteral Development. He has more than 50 patents and patent applications and is the author or coauthor of over 40 publications.

"I am very excited to join the PDA staff under Bob Myers' leadership," said Roessling. "I look forward to connecting with the Association's European community and the global membership to accomplish PDA's mission of bringing practical technical information to the pharmaceutical and biopharmaceutical industries. We have much opportunity to be of service to the members residing in Europe. "

Roessling is based in Berlin, Germany and will report directly to Robert Myers.

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Viral Safety Evaluation of Biotech Products Used in Clinical Trials

Kurt Brorson, PhD, U.S. FDA; Ralf Gleixner, Serono; Roland Guenther, PhD, Novartis; Annemarie Möritz, PhD, Novartis; Gail Sofer, GE Healthcare; Hannelore Willkommen, PhD, RBS Consulting

Following the publication in 2004 of a "Concept Paper on the Development of a Guideline on Viral Safety Evaluation of Biotechnological Products to be Used in Clinical Trials," the EU Biologics Working Party (BWP) is currently preparing the corresponding guideline. The draft document, which is expected for the first quarter of 2006, is intended to harmonize the virus safety requirements for biotechnological products in the EU Member States for getting approval to enter clinical trials.

Development of the EMEA guideline was the focus of a PDA workshop in Langen, Germany, Dec. 1, 2005. Over 100 experts from 15 countries gathered to discuss the 2004 EMEA concept paper and an industry comment prepared in response. The industry comments included a model guideline, which follows the risk-based principles contained in ICH Q5A principles, for consideration by the EMEA.

The speakers emphasized that the meeting would focus on experience with products such as monoclonal antibodies and recombinant proteins prepared using well-defined cell lines for which there exists previous industry experience, e.g., Chinese Hamster Ovary (CHO) and NS0 cells. These cell substrates have been tested and virus validation studies have been performed following the guidance provided by ICH Q5A, Q5B and Q5D by many firms on multiple occasions for both clinical and marketed biotechnology products. In early development stages, the viral clearance study program may be reduced based on supporting databases prepared from in-house experience. Unconventional cell lines or those using high risk raw materials were not included in detail in the discussions; however, general consensus was that these lines would not be eligible for reduced testing or study programs.

Several speakers noted the differences between U.S. and EU requirements to support the start of Phase 1 clinical studies. Specifically, for the FDA, validation of the manufacturing scheme with one relevant virus, i.e., a murine retrovirus, is sufficient for Phase 1 as endogenous retroviruses or retrovirus like particles are known and quantifiable contaminants of mammalian cell culture harvests. In France and Germany, data for a second model virus, usually a non-enveloped virus of the parvovirus family such as Murine Minute Virus (MMV), is also required. This requirement reflects the general consideration that the manufacturing process should have some capacity for inactivation/removal of non-enveloped viruses and also from previous experience with MMV contaminations.

The panel discussion revealed that the requirements in EU countries are more aligned with the FDA, which is considering revising the 1997 Points to Consider for Therapeutic Monoclonal Antibodies in the same general timeframe the EU is anticipated to complete its draft guidance for viral safety for clinical trials. Industry would like to support both initiatives and suggests taking advantage of the framework for an ICH initiative to reach a harmonized outcome.

There was agreement on some significant concepts:

- In-house databases would be acceptable to support reduction of the viral clearance validation effort under defined circumstances. These databases include in-house studies, describing the results for previous products, which must be applicable to the newly developed product. Line by line comparisons are requested by regulatory agencies to assess similarity of the processes to justify the reduction of the validation effort for the product in question. The opinion on which level of comparability of key parameters of the unit operations used for viral clearance would be acceptable varied from "ranges" to "identical" during the discussions at the workshop.
- Providing an overall viral safety margin is more important than providing a number for log reduction values.

The definition of the term "robust" as used to describe steps in viral clearance studies was discussed. "Robust" was defined as: the predictability that changes within the "design space" have no impact on the quality of the product. Robustness of a unit operation was not defined as the ability to clear many viruses (as currently defined in ICH Q5A) or the number of logs cleared alone. Unit operation robustness—the reliability of a unit operation and insensitivity to minor process variations—is critical for bioprocessing. Unit operations clear viruses by specific mechanisms and can be characterized for robustness based on an understanding of critical and non-critical process variables. Justification that a unit operation is robust can be acquired through small-scale studies, manufacturing

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STUDENT PROGRAMS

PDA and the *PDA Journal of Pharmaceutical Science and Technology* have established three Student Scientific Programs to promote applied research in areas of study relevant to the scientific foundations of pharmaceutical and biopharmaceutical product development, drug manufacturing and quality assurance technologies.

1 Annual Graduate Research Symposium

Graduate Students are invited to submit papers for presentation at the PDA Annual Graduate Research Symposium, to be held in conjunction with the PDA Annual Meeting, April 24-26, 2006 in Anaheim, California. Authors of papers selected for presentation will be awarded travel grants.

Travel grants!

2 Pre-Doctoral Fellowship Program

Doctoral Candidates are invited to submit dissertation research proposals for consideration. Up to four fellowship stipends will be awarded to assist selected applicants in their efforts to conduct the dissertation research projects.

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3 Student Poster Sessions

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About PDA

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Aseptic Technologies and FDA Discuss Closed-Vial Filling Technology

Russell Madsen, The Williamsburg Group, LLC

On September 12, 2005, representatives of Aseptic Technologies, a subsidiary of GlaxoSmithKline Biologicals, Belgium, met with officials from the U.S. FDA in Rockville, Maryland, regarding the new closed-vial filling technology developed by the company. FDA participants represented the centers for biologics, drugs and veterinary medicine. The contingent from the Center for Drug Evaluation and Research (CDER) included officials from the Office of Compliance and the Office of Pharmaceutical Science (OPS).

Jacques Thilly, Director, Technical Development, Aseptic Technologies, described the unique design features of two closed-vial filling lines: 1) a high-capacity line capable of speeds of 600 vials per minute, and 2) a lower-capacity clinical line ideal for filling smaller batches. These lines, which utilize identical technology, aseptically fill product into presterilized closed containers inside a barrier (ISO 5 environment), resulting both in a high level of sterility assurance and in low particulate levels. The technology eliminates the need for vial and stopper washing, sterilization and depyrogenation, and for the systems and equipment associated with those processes. Other advantages include high levels of safety for operators, supply-chain and medical personnel when handling potent or cytotoxic products. These benefits derive from the robust process design, the use of polymeric vials that eliminate breakage and the act of filling product directly into the closed vials (by a filling needle that punctures through the stopper), preventing spillage of product on the outside of the vials.

Françoise Delhalle, Director of Production, Aseptic Technologies, presented information on the validation strategies and studies which have been performed with respect to a new container-closure system. The vial and stopper materials are molded, preassembled and, for normal production, subsequently exposed to a gamma-irradiation sterilization process at 25 kGy (minimum). The closed-vial filling line incorporates e-beam irradiation for surface sterilization of the closure immediately prior to filling through the vial closure (stopper), laser resealing of the closure puncture, and application of the flip-away cap. The vial and stopper materials meet USP Class VI requirements pre- and post-irradiation sterilization, successfully passing USP <87> Biological Reactivity Tests, In Vitro, and USP <88> Biological Reactivity Tests, In Vivo. The container-closure system passes USP <661> Containers, Ph. Eur. 3.1.3 Polyolefines (vial body), USP <381> Elastomeric Closures for Injection and Ph. Eur. 3.2.9 Rubber Closures—all tests conducted post-irradiation sterilization at 25 kGy (minimum) and 50 kGy (minimum).

Vials and stoppers are manufactured and assembled robotically in a Class 100 cleanroom, resulting in very low levels of subvisible and no visible particulates. Studies have demonstrated excellent post-filling container-closure integrity.

Filling accuracy studies with different volumes and with solutions of different viscosities have shown that filling precision is between 0.2 and 0.8 percent. Media fills have been conducted. Three runs, each of 6,300 units, resulted in no units showing microbiological growth. During these media fills, the barrier was located in an uncontrolled mechanical assembly workshop environment.

Ms. Delhalle also described Aseptic Technologies' state-of-the-art contract clinical pharmaceutical facility (for filling early development compatibility/extractability samples, phase II and III clinical supplies, stability samples, etc.), which houses the clinical model of the closed-vial filling line.

Aseptic Technologies thanks FDA for participating, and, in particular, OPS' **Ajaz Hussain**, PhD (now with Sandoz), **David Hussong**, PhD; and **Patricia Tuegel** for organizing the meeting.

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Recent Sci-Tech Discussions: Vacuum Oven Mapping

The following unedited remarks are taken from PDA's Pharmaceutical Sci-Tech Discussion Group, an online forum that serves as a platform for exchanging practical, and sometimes theoretical, ideas within the context of some of the most challenging issues confronting the pharmaceutical industry. Join at www.pharmweb.net/pwmirror/pwq/pharmwebq2.html.

How many points do you map the vacuum oven? Understanding there is no air heat convection, how to position the sensor and obtain the real temperature uniformity results? Thanks in advance.

Respondent 1: The number of points is dependant on the size of the oven. For table-top models, we have only done one point per tray (the middle). For a *Stokes* dryer, we did five points per tray (four corners & center). In order to get accurate temperature readings, your probes must be in contact with the surface of the tray. Air temperatures under vacuum are non-reliable at best.

Respondent 2: Depending on how large your oven is. Typically, minimum 12 TCs are used. These TCs are securely placed within load items to ensure they are in full contact with the surfaces.

Respondent 3: This question is a tricky one. In my experience, you'll never obtain a good temperature distribution inside the vacuum oven (I'm assuming that we are talking about a lab one). One way to see the temperature distribution, is to map the oven with no vacuum following the accepted guidelines. After that, if you want to check the penetration process, choose two very thin thermocouples. Put one inside the sample and one as close as possible to the controller sensor. I will recommend that you sample the exact same one that you are using for analysis. In this way you can get a good indication if the time indicated by your method is enough to bring your sample to the required temperature.

Respondent 4: You are correct, it is really difficult to obtain good results when mapping vacuum oven, especially at higher temperature, even without vacuum, even all the sensor contact the tray and the tray contacts the back wall. I do not know what is best way to map it so far. It seems that the oven can easily shift after adjustment/cal.

Respondent 5: We positioned the TCs in the air, not touching the metal. If you want to see the tray temperature (contact with the metal) I will recommend to use some silicon paste for a better heat transfer.

Our lab had a *Tuttnauer* and a *Heraeus* oven. Heraeus had two sensors, one fixed for the temperature controller and a flexible one only to display the product/sample temperature.

Maybe speaking with the manufacturer about how do they perform the temperature mapping we'll give you the required info. After all, they provide technical specifications, so they should have a method of verification. Periodical calibration should give the assurance that your system is accurate. If you are concern about the oven performances over time, maybe you want to have a recorder connected to the oven.

PDA Interest Groups & Leaders

PDA Interest Groups are divided into five sections by subject matter. This aligns them for improved effectiveness, supports increased synergies between them and provides opportunity for Interest Group members to play a more active role in Task Forces. The five sections are Quality Systems and Regulatory Affairs, Laboratory and Microbiological Sciences, Pharmaceutical Development, Biotechnological Sciences and Manufacturing Sciences. Any PDA member can join one or more Interest Group. Please go to www.pda.org/science/IGs.html for more information or contact the Interest Group's leader.

North American Interest Groups

Section Leader	Frank Kohn, PhD *FSK Associates*	David Hussong, PhD *U.S. FDA*	Don Elinski *Lachman Consultants*	Sandeep Nema, PhD *Pfizer Inc.*	Robert Dana *PDA*
Section Title	**Biopharmaceutical Sciences**	**Laboratory and Microbiological Sciences**	**Manufacturing Sciences**	**Pharmaceutical Development**	**Quality Systems and Regulatory Affairs**
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Communication Key to a Healthy CMO-Client Relationship, continued from cover

their own companies and find themselves in unknown territory when dealing with the CMO's quality organization. The CMO, on the other hand, will have a fully functioning quality group and may find objectionable an outside source defining their job scope.

At Lonza, we have faced many challenges in this area; some companies have gone as far as insisting that we use their SOPs in our facilities—a complicated and problematic proposal! Once a small biotech start-up, whom I'll call "Company X," caused considerable consternation at Lonza by attempting to mount a full-scale audit, which they were not staffed to conduct. Fortunately, we were able to use our considerable experience with a host of similar clients to convince Company X that a simpler approach (for example, using a systems approach to ensure all required quality systems were in place) could be used, rather than attempting to emulate larger companies.

Conflicts between the quality groups such as these provide all the ingredients for the first significant squabble in the CMO-client relationship. To prevent this, it is essential that expectations are aligned early on, and the best vehicle to do this is the quality agreement. The preparation of this document also gives the key personnel in both groups the chance to interact directly and get to know each other. Don't underestimate the importance of this. Good relationships are not built around phone calls alone. Trust comes from meeting and working together.

The quality agreement itself should cover all aspects of the quality relationship. It should not address commercial or supply issues, which should be covered in the legally binding supply agreement. In legal terms, the supply agreement will always take precedent over the quality agreement; so if possible, avoid using legalistic terminology in the latter, which can dilute the intent. Companies vary widely on this issue, but in general, the best quality agreements avoid too much legal input. After all, the quality agreement should be a working document intended to provide practical guidance.

"CMOs need to be sensitive to this and not be offended by the client's initial desire to control every detail."

Trust

The extent to which the client controls (or attempts to control) quality is fundamental in developing trust, and it is this steady development of trust which is crucial to the success of the partnership. Turning back to our real-life couple, the parallel is obvious: The more that one partner tries to dominate the other, the more resentment is fostered in the dominated partner.

There are two clear messages here. First, the CMO must recognize that trust has to be earned. It is unreasonable to expect a client to hand over so much control without feeling uneasy. The level of trust that a client has in a CMO at the start of the partnership will be low. (How many of us felt totally at ease the first time we sat in the passenger seat of our cars while our spouses roared off down the road?) CMOs need to be sensitive to this and not be offended by the client's initial desire to control every detail.

The second point is the corollary of the first: Namely, if the CMO demonstrates their ability to handle things, the client must be prepared to gradually allow the CMO to take more control in areas where trust is high.

The key word here is "gradual." Neither side should push too quickly, but they should be ready to change their approach as trust levels rise. The objective is always to achieve the right balance. The question, of course, is where to draw the line? There is no easy answer to this, and clearly it will fluctuate over time as trust levels improve. Even with the same CMO, the right position for the "line" will vary from one client to another. A small start-up cannot muster the same quality resources as a multinational pharma and will likely begin to rely more on the expertise of the CMO.

Patience

So, with a contract duly signed, and a quality agreement in hand, the partnership is off and running. Everything is perfect, right? Well, not quite. Difficulties and disagreements will inevitably occur, and the most likely time for problems to arise will be when something goes wrong!

The big area of disagreement (at least between the quality groups) will involve deviations, and, to a lesser extent, change control. CMOs should be sensitive to the fact that the client is remote and, therefore, not privy to all the details of an event and how the investigation and corrective actions were handled. It is easy to unintentionally exclude the client from the details in the desire to investigate and provide answers. Returning to our real-life couple, if one partner burns dinner, the other might not be happy just ➤

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being told that the oven was too hot.

Lonza was once involved in a situation like this with "Company Y," when the first of their two clinical batches became contaminated due to a mechanical failure. In our desire to complete the investigation and find answers as quickly as possible, we neglected to keep Company Y fully apprised of the situation. This caused them unnecessary stress, and tension grew between the two organizations. After the situation was resolved and the tension subsided, the lesson for us was obvious: Positive effort needs to be spent to avoid excluding clients from these situations, and special care should be taken to ensure that deviations, in particular, are well communicated to clients in a timely manner. The key to getting through these situations is excellent communication and total openness on the part of the CMO.

On the other hand, it is essential that the client affords the CMO an opportunity to operate and complete the investigation. Information about the root cause of a contamination incident is probably not going to be available one day after the event, so it is beneficial to clients, if they have the patience, to expect answers in reasonable time frames. Communication of problem issues should ideally be handled through single points of contact on both sides, and the same individuals should handle the communication of all problem issues over the duration of the partnership, whenever possible. In this way, the individuals concerned will develop the trust and understanding needed to make this work.

It is not necessary for a client to burden itself with looking at all deviations. Clearly, significant deviations must get client input, but they should be careful not to "double-dip," or pass the deviation through their own review board which may have different views on how the investigation should have been conducted. Client review boards are remote and disadvantaged to make judgments on deviations that occur in a different facility and under a foreign quality system. Again, balance is needed. Some review is advisable and essential because the client needs to gauge any potential impact on further processing steps. The client may also be aware of information (for example, previous adverse event data) which could require that an additional investigation be carried out. By all means, clients should use their review boards to make these determinations, but they must understand that the CMO uses processes different than their own. The question is not, "Does this investigation conform with our internal procedures?" but rather, "Does this investigation make good scientific sense?" Lonza deals with this issue with some of our larger clients, and inevitably batch release is delayed.

"Client review boards are remote and disadvantaged to make judgments on deviations..."

Ideally, the client should have a permanent QA presence on the CMO site. Lonza's three largest clients all do this, and it is of tremendous benefit to both sides, greatly reducing misunderstanding and increasing trust. The client, though, must take care to empower the site representative and refrain from second-guessing his/her decisions. The main benefits that we have seen from this are: a more rapid resolution of deviations, faster approval of change requests, and last (but certainly not least), a more streamlined batch-release process. Unfortunately, for small contracts, a permanent presence may not be possible, but even a temporary presence during key activities is hugely valuable.

Communication

As with any successful relationship, time and effort needs to be spent working on the relationship itself. Going back to our real-life couple, for their relationship to last, it is not enough to have a nice house, two cars in the garage and enough cash coming in to pay the mortgage. The partners must work to keep the lines of honest communication open. The same holds true for the CMO-client relationship.

In our complex business, it is easy to become absorbed in daily problem-solving and the details of implementing the latest project. Nevertheless, quality time (no pun intended) must be dedicated to discussing how to improve the relationship itself. However, people in professional relationships, like in personal relationships, are often surprisingly reluctant to talk about problems that exist within the relationship and will sometimes go to great lengths to keep them hidden. To the contrary, it is essential to have a means of getting issues onto the table in a non-confrontational atmosphere so that they can be effectively tackled before they boil over into an irreparable breakup. At Lonza, we hold a regular meeting with most of our clients. This is typically in the form of a steering group and affords the chance to take a step back from the daily issues and ➤

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Building a Solid Quality Management System

Establishing and maintaining an effective quality management system is a complex challenge that companies must get right in order to prevent costly manufacturing errors and avoid regulatory action.

Long a regulatory expectation embodied in GMP regulations around the world, the need for an effective quality unit has never been greater. In recent years, regulators in Europe, the United States and elsewhere have begun to more vigorously stress their desire for companies to embrace a culture that focuses more on quality production. The U.S. FDA 21st century cGMP initiative and recent International Conference on Harmonisation quality initiatives are just two examples of this new environment.

When implementing or reinventing a quality management system, companies can choose to adopt and adapt well-established international standards, like those promulgated by the International Organization for Standardization (ISO) in its 9000 series, *Quality Management Systems—Fundamentals and Vocabulary*.

Proponents of the ISO standard, like **Michael Jahnke**, PhD, Head of Quality Assurance, Wulfing Pharma GmbH, believe it to be a good model, because regulators and industry professionals around the world are generally familiar and comfortable with ISO.

Using a standard like ISO 9000 can help companies avoid omissions in their quality management system. For example, Dr. Jahnke finds companies often overlook specifying in writing the responsibilities of quality and manufacturing personnel in an organizational chart.

The ISO standard also can inform companies on how to conduct meaningful self-inspections. "Auditing is a fundamental element of a quality management system," Dr. Jahnke states, "not only to verify conformance to relevant regulatory requirements but to a company's own SOPs."

To help companies build a solid ISO-style quality management system, Dr. Jahnke has written the *Quality Assurance Workbook for Pharmaceutical Manufacturers*. The book presents strategies for the setup, management and evolution of a quality management system. The book tailors the ISO model to the specific challenges of drug manufacturing (ISO 9000 is not industry-specific). Each chapter includes proven checklists and SOPs that are based on Dr. Jahnke's 15 years of experience in the industry. Notable SOPs in the book include: sterile production hygiene, change control and annual product review.

Dr. Jahnke received a PhD at the Institute of Microbiology, University of Hanover, in 1990. He joined Wulfing Pharma in 2002.

Communication Key to a Healthy CMO-Client Relationship, continued from page 22

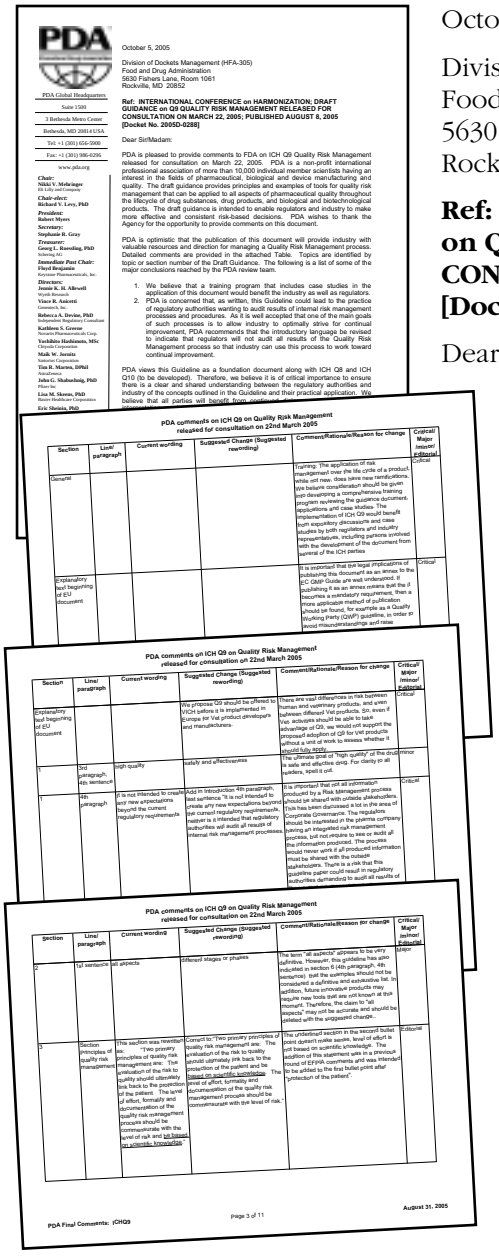
concentrate on the bigger picture. Such a meeting is an ideal opportunity to discuss the health of the relationship. One of our clients utilizes an anonymous questionnaire which is used to gather feedback on the relationship from team members on both sides. This technique is especially valuable in unearthing grievances, which might otherwise fester away precariously in the background. The survey can also deliver some big surprises about how one partner perceives the other. We rarely see our own organizations and ourselves as others see us, so such neutral feedback is invaluable. Unfortunately for Lonza, there was a situation where we did not commit enough attention to developing a relationship with one of our larger clients, to the detriment of the overall goals of the working relationship. Fortunately, the situation was recognized and corrected before any long-lasting damage was done.

It may not be an exaggeration to say that the answers to your CMO-client relationship problems may be sitting right in front of you across the dinner table. The take-home message here is, as with a real-life couple, CMO-client relationships will flourish in a true spirit of strategic compromise, trust and patience, underpinned with effective communication. It takes work, but the rewards of a successful partnership are worth the effort.

About the Author

Ian Elvins has 30 years of experience in the pharmaceutical industry, the last 10 in biotechnology. He has worked with both API and finished product manufacture. Prior to joining Lonza, Biologics, Inc. (Portsmouth, N.H.) he worked for Serono, Fisons (now Aventis) and Lederle.

PDA Comments on ICH Q9



October 5, 2005

Division of Dockets Management (HFA-305)
Food and Drug Administration
5630 Fishers Lane, Room 1061
Rockville, MD 20852

Ref: INTERNATIONAL CONFERENCE on HARMONIZATION; DRAFT GUIDANCE on Q9 QUALITY RISK MANAGEMENT RELEASED FOR CONSULTATION ON MARCH 22, 2005; PUBLISHED AUGUST 8, 2005 [Docket No. 2005D-0288]

Dear Sir/Madam:

PDA is pleased to provide comments to FDA on ICH Q9 Quality Risk Management released for consultation on March 22, 2005. PDA is a non-profit international professional association of more than 10,000 individual member scientists having an interest in the fields of pharmaceutical, biological and device manufacturing and quality. The draft guidance provides principles and examples of tools for quality risk management that can be applied to all aspects of pharmaceutical quality throughout the lifecycle of drug substances, drug products, and biological and biotechnological products. The draft guidance is intended to enable regulators and industry to make more effective and consistent risk-based decisions. PDA wishes to thank the Agency for the opportunity to provide comments on this document.

PDA is optimistic that the publication of this document will provide industry with valuable resources and direction for managing a Quality Risk Management process. Detailed comments are provided in the attached Table. Topics are identified by topic or section number of the Draft Guidance. The following is a list of some of the major conclusions reached by the PDA review team.

1. We believe that a training program that includes case studies in the application of this document would benefit the industry as well as regulators.
2. PDA is concerned that, as written, this Guideline could lead to the practice of regulatory authorities wanting to audit results of internal risk management processes and procedures. As it is well accepted that one of the main goals of such processes is to allow industry to optimally strive for continual improvement, PDA recommends that the introductory language be revised to indicate that regulators will not audit all results of the Quality Risk Management process so that industry can use this process to work toward continual improvement.

PDA views this Guideline as a foundation document along with ICH Q8 and ICH Q10 (to be developed). Therefore, we believe it is of critical importance to ensure there is a clear and shared understanding between the regulatory authorities and industry of the concepts outlined in the Guideline and their practical application. We believe that all parties will benefit from continued dialogue around clarification, interpretation, and implementation of these concepts and we look forward to continuing to contribute to this discussion.

Sincerely,

Robert B. Myers
President, PDA

Member Leadership Opportunities

Exciting Breakthroughs in Nanotechnology are Happening...

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Explore the Emerging Technology of Disposable Manufacturing

The use of disposable purification devices and manufacturing systems is increasing, and with this, the need for scientific guidance for it's application in pharmaceutical and biotech industries. PDA is forming a working group on Disposable Manufacturing—Technology and Regulation to create a comprehensive PDA program of knowledge capture (e.g., define industry trends using survey tools) and transfer (e.g., technical bulletins and reports, meetings, and training) focused on this emerging manufacturing technology. Participants on the working group should include, but not be limited to, technology providers, industry users, and regulatory champions (from industry and agencies). Global participation is encouraged. This is a great opportunity to be part of an interdisciplinary team exploring a recently emerging industry trend.

To join this working group, contact Iris Rice, Coordinator, Regulatory Affairs and Science, at +1 (301) 656-5900 or rice@pda.org.

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- **Revision of TR#14:** Industry Perspective on the Validation of Column-Based Separation Processes for the Purification of Proteins. The Task Force is looking for additional volunteers. Its kick-off meeting will be held in January. Most Task Force work will be done via e-mail and regular teleconferences. The expected duration of the project is approximately one year.
- **Revision of TR#15:** Industrial Perspective on Validation of Tangential Flow Filtration in Biopharmaceutical Applications. The mission is to update the technical report by describing current validation practices for TFF. Volunteers should work for biopharmaceutical companies in the areas of process validation and process development. Representatives from suppliers of TFF equipment and membranes are also welcomed. The Task Force will have regularly scheduled teleconferences of one to two hours.
- **Revision of TR#26:** Sterilizing Filtration of Liquids. TR 26 has proved to be a valuable tool in the application of sterilizing filtration in liquid aseptic processing. Recently, there has been considerable interest in updating the content of TR 26 to reflect changes in the industry since 1998. Team members will determine the areas of the document requiring revision in light of changes in practice and technology. Members will also consider topics to add to the document, such as the filtration of non-aqueous products, on-line, pre-integrity testing, redundant filtration, and alignment of the document with current regulatory guidance, e.g., FDA's Aseptic Guideline. The Task Force will be lead by Paul Stinavage of Pfizer.

To volunteer to join any of the Task Forces, contact Iris Rice, Coordinator, Regulatory Affairs and Science, at +1 (301) 656-5900 or rice@pda.org.

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PDA will forward all secondary membership applications directly to the R³-Nordic administrative offices in Sweden. Under the terms of the agreement, this application must be renewed each year. If you have any questions, please contact Kelly Coates, PDA Manager, Membership & Chapters, at +1 (301) 656-5900, ext. 149 or coates@pda.org.

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Israel Chapter Hosts Seminar Comparing European and U.S. Regulations

Karen Ginsbury, PCI Pharmaceutical Consulting

On November 9, 2005, the PDA Israel Chapter hosted a one-day seminar at Kfar Maccabiah, near Tel Aviv, entitled, "Gap Analysis of European versus U.S. cGMP & Regulatory Requirements." This event, attended by over 250 participants, provided an opportunity to understand and emphasize the similarities and differences between two of the major regulatory authorities in the world today.

The day started with a lecture from Dr. **Rachel Karpel**, Israeli Ministry of Health, who provided the Ministry's perspective on the progress of Israel's entry into PIC/S. This lecture was of particular interest to participants, since it clarified the Ministry's expectation that companies producing for the local market must meet European cGMPs, rather than being able to choose between EU or U.S. regulations, as was previously the case. Companies exporting to both markets obviously still have to meet both sets of requirements.

Veronique Bellaiche, Teva Pharmaceutical Industries, provided a lecture of remarkable clarity regarding post-approval CMC changes (Type I, Type II variations, as opposed to annual report, CBE or post-approval supplements). Veronique, in the short time allotted to her, managed to compare the different systems with simplicity, providing participants a clear understanding of a confusing and complicated topic.

After a coffee break, **Ilana Ziegelman** and **Einat Frydman**, both from Teva, presented, "*Approach to Quality: Risk Assessment versus Quality Manual*" and "*Comparability Protocols*," respectively. Einat's lecture tied in well with the CMC post-approval changes presentation and provided delegates with an opportunity to hear a case study.

After lunch, **Miriam Getsis**, Taro Pharmaceutical Industries, compared USP and Ph. Eur. requirements for QC testing. This presentation provided participants with a summarized comparison of the pharmacopoeias as well as case studies of in-house combined monographs prepared for products distributed to both markets.

Moti Izhar, Interpharm Laboratories Ltd., outlined cleanroom regulations, comparing the U.S. Code of Federal Regulations with Annex 1 of the EU regulations and the recently issued FDA Aseptic Processing Guide. Anyone who has struggled to make sense of the different classes and tried matching class 100, 10,000 and 100,000 against the Grade A/B/C/D system of Europe, at rest versus operational, finally had the opportunity (courtesy of **Karin Baer**, who prepared the presentation but could not be present) to see them in a single table which included class 1000, which is not acknowledged in the European Union, and Class D, or ISO 9, which is not acknowledged in the FDA Aseptic Processing Guide.

Finally, I compared nonsterile dosage form requirements, and the day was closed out by **Benny Klener** of Teva who shared inspectional vignettes from both EU and FDA inspections, both entertaining and further enlightening participants.

This was a rather special event, reflected in the turnout, in the active audience participation and in the high quality of speakers that we were lucky enough to engage. The day would not have been complete without the phenomenal organizational skills of Forum Biolog, without whom the Israel Chapter would be hard put to function.

I want to extend my personal thanks, as well as on behalf of the Israel Chapter, to all who participated.

Tel Aviv, Israel

PDA Canada Chapter Hosts First Dinner Meeting in Québec City

Hein Wick, HWMR Ltd.

The PDA Canada Chapter held its first-ever dinner meeting in Québec City on October 20, 2005. The meeting focused on rapid microbiology techniques. Over 40 people attended the event, with representatives from the pharmaceutical and biotechnology industries, governmental research centers and universities, including **Kelly Coates**, Manager, Membership & Chapters, from PDA headquarters in Washington.

Following a cocktail reception that facilitated networking, Chapter VP **Patrick Bronsard** (SNC-Lavalin Pharma) welcomed the audience with a brief introduction to the PDA Canada Chapter and PDA's mission. After dinner, Chapter Secretary **Ursula Busse**, PhD (Medicago Inc.) introduced the two speakers.

The first speaker, **Tony Cundell**, PhD, Consulting Microbiologist and member of the 2005-2010 USP Microbiology and Sterility Assurance Committee of Experts, gave an overview of the new rapid microbiology techniques and their underlying principles that have been developed over the last decade.

The second speaker, **Maitry Ganatra**, PhD, Rapid Microbiology Specialist, Pall Life Sciences Canada, discussed the key aspects of developing a validation approach for rapid microbiology methods based on the current guidance documents.

After a period devoted to questions, **Hein Wick**, Canada Chapter President, thanked the speakers and closed the meeting.

We gratefully acknowledge the help of Pôle Québec-Chaudière-Appalaches, a local industry association, for promoting and organizing the event and contributing to its success.

Visit www.pdacanada.org to be kept abreast of future Chapter events.

(l/r) Hein Wick, HWMR Ltd; Kelly Coates, PDA, Pierre Grenier, INO

(l/r) Rémi Laliberté, Validapro; Cathia Coulombe, Microbios Analytique; and Nancy Giasson Richard Talbot and Jean-Martin Guay, all three from Medicago

(l/r) Ursula Busse, Medicago; Hein Wick; Maitry Ganatra, Pall Life Sciences; Tony Cundell consulting microbiologist; and Patrick Bronsard; SNC Lavalin Pharma

Viral Safety Evaluation of Biotech Products Used in Clinical Trials continued from page 12

experience and/or consultation of the peer-reviewed scientific literature. Demonstration of robustness requires that the viral clearance unit operation can be scaled down to reflect manufacturing. A robust unit operation should follow the expected mechanism of action and provide highly reproducible reduction values within a defined set of process parameters (i.e., the design space). It was noted that for chromatography resins, the matrix chemistry as well as the ligand type may affect the viral clearance capability. For virus removal filters, matrix chemistry, pore size, and layers are important elements that vary among filter brands and must be consistent for the in-house data concept. Other factors that should be considered when designating robust design spaces for virus removal unit operations were described as molecule type, protein load, feedstock composition, flow rate, pH and conductivity. For many common unit operations, partitioning and mechanism of action have been defined by multiple studies and in the published literature.

There are several peer-reviewed publications that document robust virus clearance steps. The meeting participants recommended sharing peer-reviewed data on viral clearance. While some companies and institutions are willing to share data, publishing such data is only attractive to highly specialized journals, particularly those focused on bioprocessing. Discussions on means for sharing data are ongoing.

The conference was very well received and will, hopefully, lead to future discussions that will lead to harmonization of requirements and ultimately expedite initiation of clinical trials with biotechnology products.

The "Universe of Pre-Filled Syringes" is Expanding

James Lyda, PDA

PDA's first ever conference on the status, opportunities and technology surrounding pre-filled syringes was held in Hannover, Germany, in 2004. The excitement of that event resulted in PDA's encore conference in Munich, October 24-25. Two days, twenty-two speakers and seven sessions covered the latest information for those interested in this growing market segment. The sessions covered methods, materials and technologies, manufacturing and regulatory considerations. This conference was sold out, doubling the attendance at the 2004 conference. A capacity limit of 17 exhibitor firms completed the event.

The planning committee and the attendees were uniformly positive on the outcomes of the conference and agreed to "Expand the Universe" to a U.S. venue in 2006. PDA and the committee have agreed that Bethesda, Md., will be the city and November the month for this event.

PDA thanks the program committee for the hard work invested in planning this year's conference. The committee consisted of **Georg Roessling**, PDA; **Patrick Jeukenne**, Becton Dickinson; **Thomas Schoenknecht**, Buender Glas; **Brigitte Reutter-Haerle** and **Paul Nelles**, both with Vetter Pharma.

Stay tuned to PDA for information on the Bethesda, Md., conference and the "Universe of Pre-filled Syringes."

Universe of Pre-filled Syringes, conference planning committee (l/r) Patrick Jeukenne, Becton Dickinson; Georg Roessling, Schering; Bob Myers, PDA President; Brigitte Reutter-Haerle; Vetter Pharma; Thomas Schoenknecht, Buender Glas; Paul Nelles, Vetter Pharma.

Day 1 morning speakers, Trends, Requirements, Methods, Materials and Technologies (sitting l/r) Markus Lankers, rap ID; Robert Hormes Schott Schweiz; Thomas Schoenknecht, Bunder Glas; Mike Schaefers, West Pharmaceutical Services; (standing l/r) Klaus Holtzhauer, Schott Schweiz; Georg Roessling, Schering (moderator).

Day 1 afternoon speakers, Plastics, Glass, Safety, Auto-injectors, and Counterfeiting (sitting l/r) Thomas Voelcker, Schreiner ProSecure; Gerhard Mayer, Ypsomed; Simon Exell, Haselmeier; Constance Long, Becton Dickinson (standing l/r) Michael Eakins, Eakins & Associates; Thomas Schoenknecht (moderator); Christer Andreasson, Safety Syringes.

Day 2 morning speakers, Manufacturing, Quality and Case Studies (standing front l/r) Claire Raynal-Olive, Becton Dickinson; Bernd Renger, Vetter Pharma (moderator); (standing rear l/r) Philippe Fontcuberta, Linac; Natascha Schill, Biogen Idec; Christine Martin, Abbott GmbH; Gian Bozzato, Serono; Baerbel Hinneburg-Wolf; Vetter Pharma; Didier Meyer, La Calhene; Claudia Roth, Vetter Pharma; James Kamienski, Baxter Healthcare.

Day 2 speakers, Regulatory (l/r) James Lyda, PDA (moderator); Michael Eakins; Peter Schroeder, Mglas; William Dierick, Terumo (EUCOMED).

2006 PDA Pharmaceutical Counterfeiting Conference

Michael N. Eakins, PhD, Eakins & Associates

You can hardly pick up a newspaper or magazine these days without finding articles about the threat of counterfeit pharmaceuticals. It is certainly a "hot" topic, as the occurrence of counterfeit pharmaceuticals has increased rapidly in both Europe and the United States, despite the best efforts of the drug regulators. It is no longer only an issue for the developing nations; it is one affecting developed countries, as well. The increasing number of incidents each year only indicates that the situation is getting worse.

The danger was recognized with some foresight by FDA, which put together a task force in October 2003, leading to a report entitled, "*Combating Counterfeit Drugs*," issued in February 2004. In the area of technology, the report recognized the importance of both authentication and track-and-trace but also noted the large array of choices that are available, particularly in authentication technologies. Careful consideration must be given with respect to placing these technologies, whether in the product, within the primary packaging materials or on the labels. Regulatory issues arise as the placement of the technologies gets physically closer to the product. To aid industry in this battle against counterfeits, FDA launched www.fda.gov/counterfeit/, a website dedicated to advancing the recommendations in the report.

With FDA's recommendations in mind, PDA will hold a two-day meeting on pharmaceutical counterfeiting in March 2006 to bring together experts on the various anti-counterfeiting technologies, particularly regarding authentication technologies, as well as track-and-trace. The success and speed of implementation of radiofrequency identification (RFID) is a key topic, and the conference will include discussion of FDA's RFID initiatives, as well as case studies to illustrate experiences to date. The conference will provide an excellent opportunity to review the available technologies, both from the presentations and from the vendors and to hear the current regulatory position on RFID implementation. Look out for further announcements from PDA as to the exact date and location of this meeting.

More information will be available at www.pda.org soon!

About the Author

Michael N. Eakins is the Principal Consultant for Eakins & Associates and serves as the Program Chair for the 2006 PDA Pharmaceutical Counterfeiting Conference.

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***PDA Letter* Editor**
Walter Morris
+1 (301) 656-5900, ext. 148
morris@pda.org

Advertising
Dorothea McGuire, Sales
+1 (301) 656-5900, ext. 150
mcguire@pda.org

Copy Editor
Evelyn Heitman

Layout
Lisa Baehr

Printing and Distribution
H&N Printing and Graphics, Inc.

PDA Global Headquarters
3 Bethesda Metro Center, Suite 1500
Bethesda, MD 20814 USA
Tel: +1 (301) 656-5900
Fax: +1 (301) 986-0296
E-mail: info@pda.org
Web site: www.pda.org

PDA European Office
287 Avenue Louise
BE-1050 Brussels, Belgium
Tel: +32-2-643-2045
Fax: +32-2-645-2671

PDA Training and Research Institute
c/o UMBC Technology Center
1450 S. Rolling Road
Baltimore, MD 21227 USA
Tel: +1 (410) 455-5800
Fax: +1 (410) 455-5802
E-mail: info-tri@pda.org

Vice President's Message

Gail Sherman

Big Plans for 2006

Following an excellent 2005, TRI has set ambitious goals for 2006. Before delving into the details, let me tell you a little about how last year ended with a bang!

We had terrifically successful PDA/FDA training course series, with our biggest number of attendees ever. Our laboratory courses, including our last quarter Aseptic Processing Training Program, exceeded all expectations, and we had an opportunity through our San Antonio course series (originally planned for New Orleans) to contribute to the Hurricane Katrina Fund. We also published a catalogue of courses for 2006 that was distributed at PDA/FDA and mailed to our membership in September. And, maybe the most exciting end-of-year activity in which PDA participated was training 44 delegates of the Kazakhstan Ministry of Health in cGMPs, FDA and EU regulations, and biotechnology and aseptic processing, among other topics.

So, what are we going to do to top 2005? First, we are introducing several new, innovative laboratory courses at TRI's headquarters, and we are confident these will appeal broadly to the industry. They are: Cross Flow Filtration Evaluations, Scaling and Practical Protein Purification Separations; Process Development and Large Scale Implementation of Membrane Chromotography Devices; Environmental Monitoring Database and Trending Technologies and BioProduction Technologies. Of course, we will continue to offer the ever-popular Aseptic Processing Training Program, and Practical Aspects of Aseptic Processing (Basel, Switzerland).

The TRI lecture "road show" will make stops in the following four U.S. cities: **Lake Tahoe,** Nev; **Research Triangle Park**, N.C.; **St. Louis**, Mo.; and **Boston**, Mass. We worked closely with both the PDA Southeast and Midwest Chapters to develop the curriculum for these course series. We also will be sponsoring lectures in conjunction with PDA's major conferences, the **PDA Annual Meeting** (Anaheim, Calif.), the **PDA/FDA Joint Regulatory Conference** (Washington, D.C.), the **PDA/EMEA Joint Regulatory Conference** (London) and the **PDA Asia-Pacific Conference** (Tokyo). And, TRI courses developed by members of the TRI Advisory Board will be presented at the **PDA Biennial Training Conference** (Philadelphia, Pa.). In addition, we are in constant discussion with the PDA Chapters to provide training in conjunction with their annual meetings and other events and are planning a short course series along with the Canada Chapter Annual Meeting in Vancouver, British Columbia, in June. Check out the TRI catalog or www.pda.org/tri/index.html to learn about all the new lecture courses we've added to the 2006 lineup.

We will also present lecture courses at TRI, including the ever-popular Computer Products Supplier Auditing Model: Auditor Training, and two courses that were new in 2005, Fundamentals of Pharmaceutical Filtration and Filters and Biotechnology: Overview of Principles, Tools, Processes and Products.

This is just a synopsis of our scheduled programs. Visit www.pdatraining.org to learn more about TRI courses and capabilities at one of our many venues globally. Let us know if you would like to be added to our instructor corps, and especially if there is something that you think you would like us to deliver that is not on our current list. And please remember, we are always willing to work with you in-company as well as in our structured training programs.

Lastly, I must mention that our TRI Advisory Board is working on proposed certificate programs for training in the manufacturing sciences area. Stay tuned to the *PDA Letter* and the website for more information on this proposal.

Have a very healthy, happy new year—and see you in 2006!

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2006 Schedule

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and February 27–March 3

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and June 12-16

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August 21-25
and September 25-29

Session 4:
October 16-20
and November 6-10

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PDA Health Authority Training: Photo Highlights

On October 31, PDA TRI opened the first two-week session of training for 44 officials from the Kazakhstan Ministry of Health and National Center for Assessment of Drugs, Items for Medical Purposes and Medical Equipment. Training will continue in the future with approximately 200 Kazakh health authority officials participating.

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