

Venue: PYRAMID 2  
21<sup>st</sup> August 2007  
1515-1630 hr

## **Symposium 2A: Technological advances**

### **S2A-1. Lean Six Sigma in laboratory service**

Melo Murilo

*Associate Professor of Physiology and Molecular Medicine, Santa Casa de São Paulo Medical School and Medical Director of SAE –Clinical Laboratory, Brazil*

Laboratories face worldwide the same economic pressure, to do more with less. To cope with this situation many laboratories have changed their operations with lean six-sigma approaches. Lean originates from the Toyota Production System, and advocates a continuous cost reduction through elimination of waste. Waste is everything that does not add value in the eyes of the customer. There are basically seven types of waste: overproduction, wait, transportation, processing, inventory, moving and defects. Several techniques can be used to reduce waste, but the true challenge is not what technique to use, but how to get people really involved. Frequent and open communication is the key to success. Although Lean deployments are terrific for the laboratory, to achieve optimum results we also use Six-Sigma tactics. Six-Sigma originated at Motorola and requires good data analysis. Six-Sigma aims at a level of quality of 3.4 defects per million operations. Collecting data in the first place is superb – one can only improve something that can be measured. Six-Sigma focuses on the consistency of processes, assuring that it operates in such a manner to deliver high-quality, everytime. When using Lean Six-Sigma we must focus on the Voice of the Customer (understanding what is perceived as a defect for the customer) and use a DMAIC (Define Measure → Analyze → Improve → Control) methodology to change the status-quo.

### **S2A-2. Lab optimization via automation**

Christopher C

*Vice-President, Global Solutions for Dade Behring, USA*

This presentation will review the universal drivers for operational improvement for the clinical lab while focusing on viable solutions including Lean and lab automation. The speaker will discuss best practices deployed world-wide that are meeting the demanding needs of today's clinical laboratory. Case study results will be included.

### **S2A-3. Tumor chemosensitivity and chemoresistance assays**

Engin Ulukaya

*Department of Biochemistry, Uludag University, Medical School, Bursa, Turkey*

For quite a long time, the systemic treatment of malignancies has been based on physicians' empirical judgement, relying on data obtained from clinical trials (population-based approach). However, even histopathologically identical tumors behave so differently that the response rate of tumors to the chemotherapeutics is varied. In other words, each patient responds differently. Therefore, the effectiveness of current therapeutic approaches is limited mainly by tumor heterogeneity, which often

causes the failure of the successful treatment of cancer patients. **Detecting the chemosensitivity and/or chemoresistance of tumor tissue freshly removed from the patient during routine surgical operation to anti-cancer agents *in vitro* (ex vivo) could overcome this difficulty.**

Tumor chemosensitivity (or chemoresistance) assay (TCA) is an *ex vivo* means of determining the cytotoxic (and/or cytostatic) potential (in other words, for many anti-cancer drugs, apoptosis-inducing effect) of chemotherapeutic agents on malignant cells isolated from individual fresh cancer tissues or biopsy specimens removed from cancer patients. Recent achievements in this research area seem to put this test in a promising position in oncology practice. The chemosensitivity testing can be used as a tool to let oncologists know about which anti-cancer drugs are more likely to work well enough (or not) on their patients. It is thought that outcome of patients (e.g. the response rate and progression-free survival) as well as their life quality could be improved by performing such tests. More benefits are also expected. There are a number of tests being used for this aim.

Among these methods, the clonogenic assay, the thymidine incorporation assay, the DISC assay, the tissue explant assay, the fluorescence assays, the ATP-TCA assay and the MTT (3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide) assay should particularly be mentioned. The common feature of these methods is the employment of cell culture techniques. These methods differ in their processing, and the technique used to measure sensitivity/resistance. All techniques involve 4 basic steps: 1) isolation of cells; 2) incubation of cells with anticancer agents for certain period of time (2-6 days); 3) assessment of cell viability; and 4) interpretation of the results.