Supplementary Abstracts

# Coagulations Assays

## 1129

COMPARISON OF THROMBELASTOGRPAHY WITH COMMON COAGULATION TESTS. J.A. Caprini, L. Zuckerman, E. Cohen, J.P. Vagher, E. Woodward, J. Mitchell, R. Wonder Llama. Department of Surgery, Evanston Hospital and Vogelback Computing Center, Northwestern University, Evanston, IL.

Thrombelastographic (TEG) results were compared with hematocrit (HCT), platelet count (PLT), prothrombin time (PT), partial thromboplastin time (PTT), fibrinogen concentration (FIB), and fibrin split products (FSP) concerning the ability of the test or tests to differentiate between 141 normal adult volunteers and 121 patients with histologic evidence of malignancy. The cancer patients were studied because they represent a contrasting group with respect to coagulation abnormalities. Using canonical correlation, the normal subjects' TEG and coagulation tests captured all significant information in a single dimension, indicating that a single variation in the coagulation tests would result in a single change in the TEG. In the cancer patients, 3 pairs of functions were required to capture the correlations between the TEG and the other tests:

1. The first, which accounts for 40.8% of the correlation, links the abnormal rates and magnitudes of fibrin polymerization in the TEG to static constituents (HCT, PLT, and FIB)
2. The second, accounting for 22.6% of the correlation, relates the kinetics and magnitude of clot formation in the TEG to both dynamic and static measurements (PLT and PTT)
3. The third equation relates the kinetics of coagulation to kinetic assays ( PTT, PT, and FSP )

This implies that 3 independent processes may be occuring in the cancer patients and this information is captured by the TEG. In addition, discriminant function analysis demonstrated that the TEG alone was capable of a 96.7% discrimination between the two groups, while all the other tests combined could only predict 72.3%. Thus, due to its ability to be simultaneously sensitive to different processes, the TEG may add valuable information to the coagulation testing regimen.

## 1130

SYNTHETIC PEPTIDE ASSAYS FOR MONITORING THE DEFECTS OF EXTRINSIC AND INTRINSIC PATHWAYS OF COAGULATION: SELECTION OF A SUITABLE SUBSTRATE. Jeanine Walenga, Jawed Fareed, Harry L. Messmore, and Judith Kniffin. Loyola University Medical Center, Maywood, IL 60153, U.S.A.

Several assays based on the use of thrombin specific synthetic peptide substrates have been proposed for the amidolytic equivalents of prothrombin time (PT) and partial thromboplastin time (PTT). All of these methods employ the same principle as the clotting assays; the test plasma is activated with either thromboplastin or activator-cephaloplastin mixture and the generated thrombin activity is measured employing thrombin-specific synthetic substrates such as Bz-Phe-Val-Arg-pNA (S-2160), H-D-Phe-Pip-Arg-pNA (S-2238), Tos-Gly-Pro-Arg-pNA (Chromozym TH), and $CH_3$-Gly-Pro-Arg-pNA. These substrates and their free peptide forms inhibit the amidolytic action of bovine Xa activated human and Xa Russell's viper venom in the following order: S-2160 > S-2238 > Sarc-Pro-Arg-pNA $\geq$ Chromozym TH. A new substrate for thrombin Pyro-Glu-Pro-Arg-pNA (S-2366) and a plasminogen activator (tissue) substrate, H-D-Ile-Pro-Arg-pNA (S-2288) have been tested and were found to produce weaker inhibition of bovine and human Xa. Tos-Gly-Pro-Arg-pNA, Sarc-Pro-Arg-pNA and H-D-Ile-Pro-Arg-pNA were found to produce a $\leq$ 10% inhibition of the activator generated Xa's amidolytic activity at concentrations which are commonly employed in the PT and PTT assays. Although in the developmental stages the synthetic substrate equivalent assays are more sensitive than the existing PT and PTT assays and provide useful information on the total amount of thrombin generated in each assay, our results suggest that amidolytic equivalent assays for PT and PTT are feasable. However proper selection of a peptide substrate is important as some of the thrombin substrates and their free peptide forms may inhibit Xa and other serine proteases which are generated during the activation step thereby seriously influencing the results.