Minutes (Draft)
Scientific Advisory Subcommittee Meeting
May 5, 2008
DFS Central Laboratory, Classroom 1 & 2

Members Present

Wanda Adkins
Elizabeth Ballard
Jeffrey Ban
David Barron, Ph.D.
Joseph Bono
Katie Carlson
Dale Carpenter
Robin Cotton
Angie Cunningham
Barry Fisher
Michele Gowdy
Ann Marie Gross
Linda Jackson
Bradford Jenkins
Cathryn Knutson
Dan Krane, Ph.D.
Alka Lohmann
Peter Marone
Carna Meyer
Carissa Onorato
Alphonse Poklis, Ph.D.
John Przybylski
Stephen Rodgers
Norah Rudin, Ph.D.
Brian Shannon
Steven Sigel

Barry Fisher, Chairman of the Scientific Advisory Committee, called the meeting the order at 9:05 a.m.

Mr. Fisher thanked all the participants for participating in each of the subcommittee. Mr. Fisher had all in attendance to introduce themselves and where they were from.

Mr. Fisher explained that at the Forensic Science Advisory Board meeting on January 9, 2008 that the Board requested the Scientific Advisory Committee to perform and review the Y-STR testing that DFS is validating and report to the Board by the May 7, 2008 meeting. It was also requested other new technologies be reviewed for presentation to the Board on May 7, 2008 for Breath Alcohol New Instrumentation, AccuTOF-Dart and Mitochondrial DNA. He further explained that the Code of Virginia by statute formed

the Forensic Science Board as a policy board and part of their responsibility is to have the Scientific Advisory Committee to review and make recommendations on new scientific programs, protocols, and methods of testing for the Board's approval

As Chairman of the Scientific Advisory Committee, I created subcommittees to review this information and that's why each of you are here today to look into the procedures and protocols of each of the areas. Your subcommittees will report to the Scientific Advisory Committee on May 6, 2008 and then the committee will decide on what information to submit to the Forensic Science Board at its meeting on May 7, 2008.

Mr. Fisher explained that these meeting are covered by FOIA (Freedom of Information Act) and are considered open meetings and maybe attended by the general public. All the meeting will be recorded and minutes will be taken at the subcommittee meetings.

Mr. Fisher asked each committee at the end of their meetings today to be able to make a decision or draw a conclusion on these new methodologies. He felt they each had three choices:

1) DFS is not ready to implement
2) DFS is ready to implement
3) DFS is given provisional approval with further information to be given to Scientific Advisory Committee for additional review.

Each subcommittee shall appoint a Chairman and this person will be required to address the Scientific Advisory Committee on their recommendations at the meeting on Tuesday, May 6th. Each subcommittee's recommendations should be addressed to Mr. Fisher by the end of the day.

Mr. Fisher dismissed the sub-committees.

Minutes (Draft)
Scientific Advisory Committee
AccuTOF-DART Subcommittee Meeting
May 5, 2008
DFS Central Laboratory, Second Floor Conference Room

Subcommittee Members Present:

Mr. Joseph Bono
Dr. Dale Carpenter

Staff Members Present:

Mr. Robert Steiner, Forensic Scientist Senior, AccuTOF-DART Primary Operator
Ms. Linda Jackson, Controlled Substances Section Chief
Mr. John Przybylski, Controlled Substances Section Supervisor (Subcommittee Minutes Recorder)
Mr. Pete Marone, Department Director
Dr. David Barron, Technical Services Director

Call to Order

Mr. Przybylski called the meeting to order at 9:26AM. He noted that there would be a period for public comment towards the end of the meeting.

Subcommittee Chair Nomination

It was agreed by consensus that Mr. Bono would serve as the AccuTOF-DART Subcommittee chairman.

Summary of AccuTOF-DART Method Development and Validation

Mr. Bono asked for a summary explanation of how the AccuTOF-DART method was developed and validated at DFS.

Mr. Steiner indicated that the DART had been delivered to DFS in November of 2006 and had been operational as of February 2007. He reported that he had performed extensive work on validation and method development for the instrument. He listed and described the areas in which he had performed this work, which was modeled on the SWGDRUG guidelines, including: sampling study, limits of detection (LOD) study – particularly lower limits of detection (LLOD), daily calibration and reproducibility studies, comparison study, selectivity study and a ruggedness study.

Mr. Steiner reported that the comparison study involved 553 samples that were analyzed on the DART. These samples had previously been analyzed using GC/MS during routine casework. The study was blind in that the original conclusion formed using GC/MS data

was unknown to the DART operator at the time the samples were run on the DART. Comparison of results was made possible through sample tracking by barcodes on the sample vials. Of the 553 samples, 552 indicated the same drug of highest schedule as that found in the GC/MS data. The exception was a heroin sample with an excipient that caused some interference, but not to the point that the DART data generated could not have been used for screening purposes. The results of this study were made available to the Committee.

Mr. Steiner reported that the selectivity study involved DART analysis of mixtures of drugs that are empirical isomers. He found that some empirical isomers were distinguishable (e.g. Cocaine and Scopolamine) while others were not (e.g. LSD and LAMPA, Bufotenine and Psilocyn). Selectivity is sufficient for use as a screening method.

Mr. Steiner went on to say that he discovered that the level of DART training a person had received, had a direct correlation to how well they did in the ruggedness study.

Questions from the Subcommittee

Mr. Steiner informed the subcommittee that he and an intern have written a paper based on a GHB research project with the DART, which has been submitted and accepted for publication in the January 2009 *Journal of Forensic Science*. He has also submitted the validation study for the DART as a Technical Note to the same publication and it is currently under review.

Mr. Steiner reported that he has been continually building a library for the DART. Dr. Carpenter asked how large the library is currently. Mr. Steiner reported that the Empirical Formula Library has approximately 580 entries, the Drug Standard Library has approximately 95 standards, and the Preparation Library has approximately 300 standard pharmaceutical preparations.

Mr. Bono inquired as to whether the primary focus was on the molecular ion for the spectra generated. Mr. Steiner explained that the DART utilizes function switching by increasing the Orifice 1 voltage consecutively at 20V, 30V, 60V and 90V every 0.25 seconds, thereby collecting four pieces of data a second. At the lower voltage of 20V, the molecular ion ($M+H^+$ in positive ion mode, $M-H^+$ in negative ion mode) would be the primary focus, while increasing the voltage resulted in greater fragmentation and thus greater specificity in many cases. Fragmentation occurs through collision induced dissociation (CID) that occurs post-ionization.

Mr. Bono asked about the ability of the DART to distinguish between Methamphetamine and Phentermine to which Mr. Steiner replied that it could do so easily, clearly evident in the selectivity study data. Mr. Steiner also indicated that mixtures could be analyzed, but because there is no chromatography, the ions from the full components are observed. A spectrum generated at a lower voltage such as 20V or 30V could then be searched against a database to aide the examiner in determining which drugs may be present. Additionally,

respective fragment ions for each molecular ion should be observed as the voltage is increased.

Mr. Bono asked if there was a limit of detection difference for different drugs. Mr. Steiner replied that there was a difference as one drug may have a different proton affinity than another. The established limit of detection for the drugs tested at DFS is 0.05 mg/ml.

Mr. Bono asked what is keeping the AccuTOF-DART from being a Category A test. Ms. Jackson expressed the sentiment echoed by Mr. Steiner that it was a relatively new technology and there had not yet been enough time to collect the necessary data to support its classification as a Category A test. Mr. Steiner related that there were still a lot of projects to undertake. Ms. Jackson believes that eventually it will be considered a Category A for specific drugs.

When Mr. Bono asked what Mr. Steiner would attack regarding the technology if he were a critic, Mr. Steiner answered "selectivity," which had already been discussed. The same held true for operator technique. Dr. Carpenter also suggested that automation may overcome inconsistencies with operator technique to which Mr. Steiner agreed.

Dr. Carpenter asked whether or not drugs of lower schedule may be missed when looking for the highest scheduled drug. Mr. Steiner replied that the opposite was actually true; as the DART had a higher sensitivity than more conventional analysis using GC/MS. Mr. Bono added that in any event a simple extraction would resolve this issue.

Consensus Approval

Mr. Bono commented that his recommendation would be to bring the AccuTOF-DART online. Dr. Carpenter concurred. It was agreed that Mr. Bono would present this recommendation to the Scientific Advisory Committee.

Public Comments

Public Comment was taken.

Adjournment

The meeting was adjourned at 10:12 A.M.