



Biomarkers Sub-Group Jeju Island 2015 Report

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SG Objectives

- ❖ **Objective 1: To review present knowledge of tobacco and smoking-related biomarkers of exposure and effect, and to document these in meeting minutes, CORESTA reports and scientific publications where appropriate**
- ❖ **Objective 2: To undertake ring trials / proficiency tests for selected biomarkers as agreed by SC**
- ❖ **Objective 3: To source and develop reference materials to support biomarker analysis for those biomarkers selected for ring trials / proficiency tests**



Recent Meetings

- ❖ **October 11, 2014: Quebec City, Canada**
 - 25 delegates attended the meeting

- ❖ **May 7, 2015: Zurich, Switzerland**
 - 30 delegates attended the meeting
 - The Sub-Group meeting was hosted by Celerion
 - Biomarkers SG and Tobacco Smoking Behaviour SG typically hold joint meetings
 - TSB SG (morning)
 - BMK SG (afternoon)



Quebec meeting (2014 October)

❖ Objective 1

- Investigation of changes in the levels of biomarkers of exposure in adult Japanese smokers who switched to a non-combustion inhaler type of tobacco product – Dai Yuki
 - A 29 day clinical study with three cohorts: non-smokers, smokers and smokers who were switched to “zerostyle mint” non-combustion inhaler
 - Higher levels of urinary nicotine equivalents in the switcher group relative to non-smokers, but lower than smoker group
 - Lower levels of biomarkers of exposure reported in the switcher group



Quebec meeting (2014 October)

❖ Objective 1 (continued)

- **Biomarkers of the smoke-related exposure to polycyclic aromatic hydrocarbons (PAH) – Max Scherer**
 - Several biomarkers of PAH exposure from smoking investigated
 - 1-OH appears to be the most robust biomarker for the smoking-related exposure
 - Further work is required on potential biomarkers for the exposure to benzo[a]pyrene
- **Comparative analysis of biomarkers of effect on multiple platforms – Kirk Newland**
 - Biomarker analysis, fit-for-purpose assay development and validation



Quebec meeting (2014 October)

❖ Objective 2

- **Discussion on NNAL Proficiency Testing (PT)**
- **Several concerns regarding the processes used for NNAL PT through G-EQUAS were discussed**
 - Insufficient replicates and concentration ranges
 - Samples shipped at room temperature
- **Other potential candidate markers for PT**
 - Nic+10



Quebec meeting (2014 October)

❖ Objective 3

➤ *Reference Standards: Science vs Regulations – Frank Deschamps (Aptochem)*

- Discussion on whether a guideline on tobacco industry standards for reference materials could be developed and presented to CORESTA
- Frank agreed to provide more information at the next SG meeting
- Members generally recognized that a common global standard does not exist, and felt the need for additional discussion



Quebec meeting (2014 October)

❖ Additional Discussion

- **Consideration on data standards on bioanalytical data**
 - Along the lines of pharma model. Benefits include:
 - standardized submissions to regulatory agencies
 - common nomenclature
 - simplified data reporting by bioanalytical labs
- **Inclusion of biomarkers of effect in the SG scope**
 - In progress – presentations and evaluation of analytical methods



Quebec meeting (2014 October)

❖ Additional Discussion (continued)

- Inclusion of biomarkers of e-cigarette exposure in the SG scope
- Determination of the interest of the member companies to consider prospective biomarker evaluation in smokers who quit smoking
 - An opportunity for industry wide collaboration
 - Delegates to discuss this possibility with their management



Zurich meeting (2015 May)

❖ **Objective 1: The following presentations on analytical methods and biomarker discovery were given:**

➤ **An Improved Analytical Method of Hydroxy Polycyclic Aromatic Hydrocarbons in Human Urine – Wang Sheng**

- Reliable and simple method for simultaneous determination of urinary OH-PAHs
- Baseline resolution of 5 isomers of OH-Phenanthrene was accomplished

➤ **Alterations in the sputum proteome and transcriptome in smokers and early-stage COPD patients – Florian Martin**

- Sputum protein signature suggests that the trends observed in smokers and non-smokers were amplified in COPD vs smokers
- Blood gene expression signature that discriminates smokers and non-smokers was identified



Zurich meeting (2015 May)

❖ Objective 1 (continued)

- **A Discussion on Biomarkers of Effect – Claire Martin**
 - Focusing on a few established markers- cytokines and eicosanoids
 - Concept of an industry consortium
- **Overview of literature on Eicosanoids and Bioanalytical approaches – Kirk Newland**
 - Analytical approaches used for measurement of eicosanoids
 - Potential to conduct method evaluation with other labs, under objective 2



Zurich meeting (2015 May)

❖ Objective 2

➤ NNAL PT: Lots of discussion on resolving issues

- Basic question – how do we conduct PTs and which mechanism is better suited for PT
- A pilot room temperature stability test will be performed by ABF to address the issues of shipping at room temperature
- Member lab delegates to check with their management on whether to conduct a more thorough PT



Zurich meeting (2015 May)

❖ Objective 3

- **A presentation “Reference Standards: Science vs Regulations” – Frank Deschamps (Aptochem)**
 - The SG agreed to constitute a writing committee to recommend guidelines for reference materials used in bioanalysis of tobacco-related biomarkers



Zurich Meeting (2015 May)

❖ Additional discussion

- **Members agreed that the idea of conducting a collaborative cessation biomarker study is ambitious**
 - A smaller project with more defined scope would be more feasible
 - A ring trial on biomarkers of effect involving eicosanoids was proposed
- **There was some discussion on arriving at common data standards for bioanalysis**
- **Members were encouraged to explore defined opportunities for collaborative biomarker research projects**



Acknowledgement

❖ We sincerely thank the members of the Biomarkers and Tobacco Smoking Behavior Sub-Groups