

**Attachment 6**

**PATH Study  
Additional Information on Biospecimens**

**June 26, 2014**

**PATH Biospecimen Analytes by Specimen and Biomarker, Wave 2**

| Analyte   | Preferred Matrix             | Biomarker                            |
|---|------------------------------|--------------------------------------|
| <b>Tobacco Biomarkers in Tobacco Users and Non-tobacco Users</b>  |                              |                                      |
| Nicotine and nicotine metabolites<br><b>Tobacco user:</b> cotinine and trans-3'-hydroxycotinine<br><b>Non-tobacco user:</b> cotinine  | Serum                        | Exposure                             |
| Nicotine and nicotine metabolites<br><b>Tobacco user:</b> cotinine, trans-3'-hydroxycotinine, cotinine N-oxide, nicotine N-oxide, nornicotine, norcotinine; analogues: anabasine, anatabine<br><b>Non-tobacco user:</b> cotinine and trans-3'-hydroxycotinine | Urine                        | Exposure                             |
| Tobacco specific nitrosamines (TSNAs): NNAL, NNN, NNA, NAT, NAB, NNK  | Urine                        | Exposure                             |
| Polycyclic aromatic hydrocarbons (pyrene, naphthalene, phenanthrene, fluorene)  | Urine                        | Combustion                           |
| Cadmium, cobalt, uranium, lead, strontium, beryllium, manganese, and thallium   | Urine, prescreened container | Toxicity                             |
| Speciated arsenic (As III, As V, dimethylarsinic acid (DMA), and monomethylarsonic acid (MMA))  | Urine, prescreened container | Toxicity                             |
| Creatinine  | Urine                        | For correction                       |
| 4-ABP hemoglobin  | Red blood cells, EDTA        | Toxicity                             |
| VOCs metabolites  | Urine                        | Combustion                           |
| Volatile nitrosamines   | Urine                        | Combustion                           |
| Aromatic amines   | Urine                        | Combustion                           |
| Cyanide   | Urine                        | Combustion                           |
| <b>Other Biomarkers in Tobacco Users and Non-tobacco Users</b>  |                              |                                      |
| C-reactive protein  | Serum, red top or SST        | Inflammation;<br>Cardiovascular risk |
| Fibrinogen  | Plasma, citrate              | Cardiovascular risk                  |
| Interleukin 6   | Plasma                       | Inflammation                         |
| sICAM (soluble intercellular adhesion molecule)   | Plasma, EDTA or Serum, SST   | Cardiovascular risk                  |
| F2-isoprostane / 8-epi-prostaglandin F2a  | Urine                        | Oxidative stress                     |

Population Assessment of Tobacco and Health (PATH) Study (NIDA)

Note. At Wave 2, blood will be collected and analyzed from the adults who age into the adult cohort from the youth cohort.

At Wave 2, urine will be collected and analyzed from a sample of 10,000 adults who also provided urine and blood for analysis at baseline. In addition, urine will be collected and analyzed from the adults who age into the adult cohort from the youth cohort.