**Tables**

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| **Table 1.** Descriptive statistics of the study population (n=18) | |
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| Characteristic | Measure |
| Age(years, mean ± SD) | 10.6 ± 1.7 |
| Male n(%) | 13(72.2) |
| Race n(%) |  |
| African American | 5(27.8) |
| Hispanic | 10(55.6) |
| White | 3(16.6) |
| Maternal education n(%) |  |
| <High school | 2(12.5) |
| High school graduate | 9(56.3) |
| Some college | 5(31.2) |
|  |  |

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| **Table 2.** Distribution of percent methylation of CpG loci in NOS and ARG genes | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| Gene loci | location | n | Mean | SD | IQR | 25th | Median | 75th | Min | Max |
| NOS1 |  |  |  |  |  |  |  |  |  |  |
| Position 1 | 5-UTR | 87 | 74.9 | 9.5 | 8.3 | 71.9 | 75.4 | 80.2 | 27.7 | 100.0 |
| Position 2 | 5-UTR | 87 | 90.9 | 7.5 | 5.2 | 89.1 | 91.9 | 94.4 | 37.1 | 98.1 |
| Position 3 | 5-UTR | 87 | 69.2 | 7.4 | 8.1 | 65.7 | 69.4 | 73.9 | 42.4 | 91.9 |
| Position 4 | 5-UTR | 87 | 79.8 | 3.7 | 2.4 | 79.2 | 80.4 | 81.6 | 62.4 | 85.5 |
| Position 5 | 5-UTR | 87 | 82.9 | 3.7 | 4.4 | 80.7 | 83.3 | 85.2 | 67.4 | 91.4 |
| Position 6 | 5-UTR | 87 | 75.9 | 4.4 | 3.4 | 74.6 | 76.6 | 78.0 | 47.3 | 85.3 |
| Average |  | 87 | 78.9 | 4.4 | 4.1 | 77.1 | 80.0 | 81.2 | 59.4 | 90.9 |
| NOS2A |  |  |  |  |  |  |  |  |  |  |
| Position 1 | Intron 1 | 89 | 53.8 | 9.0 | 5.5 | 50.9 | 54.0 | 56.3 | 0.0 | 98.6 |
| Position 2 | Intron 1 | 89 | 79.4 | 6.5 | 6.4 | 76.1 | 79.7 | 82.5 | 55.3 | 99.0 |
| Position 3 | Intron 2 | 90 | 1.0 | 0.7 | 1.2 | 0.5 | 1.0 | 1.6 | 0.0 | 3.0 |
| Position 4 | Intron 2 | 90 | 0.6 | 0.5 | 0.9 | 0.0 | 0.6 | 0.9 | 0.0 | 2.3 |
| Position 5 | Intron 2 | 90 | 2.8 | 1.7 | 1.4 | 2.1 | 2.8 | 3.5 | 0.0 | 10.7 |
| Position 6 | Intron 2 | 90 | 1.8 | 1.4 | 1.5 | 1.0 | 1.9 | 2.5 | 0.0 | 8.7 |
| Position 7 | Intron 2 | 90 | 1.3 | 0.9 | 1.9 | 0.0 | 1.3 | 1.9 | 0.0 | 3.7 |
| Position 8 | Intron 2 | 90 | 1.6 | 1.0 | 1.2 | 1.1 | 1.6 | 2.3 | 0.0 | 5.7 |
| Position 9 | Intron 2 | 90 | 1.3 | 0.8 | 0.9 | 0.9 | 1.4 | 1.8 | 0.0 | 3.9 |
| Position 10 | Intron 2 | 90 | 0.9 | 0.7 | 1.4 | 0.0 | 1.1 | 1.4 | 0.0 | 2.6 |
| Position 11 | Intron 2 | 90 | 1.1 | 0.8 | 1.6 | 0.0 | 1.3 | 1.6 | 0.0 | 3.7 |
| Position 12 | 5-Upstream | 87 | 91.2 | 3.5 | 2.7 | 89.8 | 91.1 | 92.5 | 73.9 | 100.0 |
| Position 13 | 5-Upstream | 87 | 95.6 | 3.3 | 5.0 | 93.2 | 96.4 | 98.2 | 86.7 | 100.0 |
| Position 14 | 5-UTR | 87 | 82.6 | 8.0 | 8.4 | 79.2 | 83.4 | 87.6 | 42.2 | 100.0 |
| Position 16 | 5-UTR | 87 | 88.6 | 11.0 | 3.5 | 88.6 | 90.6 | 92.2 | 0.0 | 96.9 |
| Average |  | 90 | 32.8 | 4.7 | 1.1 | 33.1 | 33.8 | 34.2 | 0.0 | 35.8 |
| NOS3 |  |  |  |  |  |  |  |  |  |  |
| Position 1 | Intron 1 | 86 | 72.3 | 10.9 | 9.1 | 67.9 | 72.0 | 77.0 | 16.6 | 100.0 |
| Position 2 | Intron 1 | 86 | 76.5 | 11.1 | 8.9 | 72.2 | 78.8 | 81.1 | 16.7 | 100.0 |
| Position 3 | Intron 1 | 86 | 66.3 | 12.3 | 17.0 | 57.5 | 70.4 | 74.5 | 32.7 | 87.1 |
| Average |  | 86 | 71.7 | 9.2 | 10.9 | 65.9 | 74.2 | 76.8 | 39.2 | 91.9 |
| ARG1 |  |  |  |  |  |  |  |  |  |  |
| Position 1 | 5-Upstream | 90 | 86.9 | 5.1 | 6.4 | 83.8 | 88.0 | 90.2 | 72.8 | 96.7 |
| Position 2 | 5-Upstream | 90 | 91.3 | 2.8 | 3.4 | 89.9 | 91.6 | 93.2 | 84.2 | 98.6 |
| Position 3 | 5-Upstream | 90 | 9.3 | 3.3 | 3.6 | 7.9 | 9.1 | 11.4 | 0.0 | 16.7 |
| Position 4 | 5-Upstream | 90 | 24.6 | 6.1 | 8.7 | 20.6 | 25.1 | 29.2 | 3.1 | 36.0 |
| Position 5 | 5-Upstream | 90 | 5.6 | 2.2 | 2.5 | 4.5 | 5.6 | 7.0 | 0.0 | 10.2 |
| Position 6 | 5-Upstream | 90 | 44.4 | 16.9 | 23.4 | 33.3 | 42.5 | 56.7 | 0.0 | 100.0 |
| Position 7 | Exon 1 | 90 | 71.3 | 10.0 | 8.0 | 67.5 | 72.4 | 75.5 | 5.2 | 100.0 |
| Position 8 | Intron 1 | 90 | 54.3 | 7.8 | 10.7 | 49.2 | 54.8 | 59.9 | 33.1 | 82.0 |
| Average |  | 90 | 48.5 | 2.6 | 2.9 | 47.1 | 48.4 | 50.0 | 36.6 | 54.7 |
| ARG2 |  |  |  |  |  |  |  |  |  |  |
| Position 1 | 5-UTR | 87 | 0.6 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.4 |
| Position 2 | 5-UTR | 87 | 0.8 | 1.3 | 1.9 | 0.0 | 0.0 | 1.9 | 0.0 | 4.7 |
| Position 3 | 5-UTR | 87 | 0.2 | 1.3 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 11.8 |
| Position 4 | 5-UTR | 87 | 0.1 | 0.4 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 2.5 |
| Position 5 | 5-UTR | 87 | 0.0 | 0.2 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.6 |
| Position 6 | 5-UTR | 87 | 0.2 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 3.0 |
| Position 7 | 5-UTR | 87 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Position 8 | 5-UTR | 87 | 0.1 | 0.7 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 6.0 |
| Position 9 | 5-UTR | 87 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Position 10 | 5-UTR | 87 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Position 11 | 5-UTR | 87 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Position 12 | 5-UTR | 87 | 0.3 | 1.8 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 16.3 |
| Position 13 | 5-UTR | 87 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Average |  | 87 | 0.2 | 0.2 | 0.3 | 0.0 | 0.0 | 0.3 | 0.0 | 1.3 |
| Abbreviations: IQR, interquartile range; Max, maximum; Min minimum; 5-UTR, 5-untranslated region. 25th and 75th are percentiles | | | | | | | | | |  |

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| **Table 3.** Distribution of BC, daily average NO2, and FeNO | | | | | | | | | | | | | | | |
|  |  |  |  |  |  |  | |  | |  | |  | |  | |
|  |  | N | Mean | SD | IQR | 25th | | Median | | 75th | | Min | | Max | |
| BC(μg/m3) | without MI | 90 | 1.6 | 1.4 | 1.1 | 0.8 | | 1.1 | | 1.9 | | 0.2 | | 7.0 | |
|  | with MI | 90 | 1.4 | 1.2 | 1.0 | 0.7 | | 1.0 | | 1.6 | | 0.2 | | 6.2 | |
| NO2(ppb) | without MI | 74 | 40.6 | 25.1 | 27.9 | 23.3 | | 36.7 | | 51.2 | | 3.4 | | 138.3 | |
|  | with MI | 90 | 41.7 | 23.2 | 26.2 | 25.3 | | 39.3 | | 51.5 | | 3.4 | | 138.3 | |
| FeNO(ppb) |  | 89 | 30.6 | 28.3 | 42.0 | 9.0 | | 17.0 | | 51.0 | | 2.5 | | 106.0 | |
| Note: BC data were measured 24-hour before buccal sample collection. | | | | | | |  | |  | |  | |  | |  | |
| Abbreviations: BC, black carbon; NO2, nitrogen dioxide; FeNO, fractional exhaled nitric oxide; MI, multiple imputation; IQR, interquartile range | | | | | | | | | | | | | | | |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Lag | Model 1 | |  | Model 2 | |  | Model 3 | |  | Model 4 | |  |
| n | Percent change in FeNO (95%CI) | p | n | Percent change in FeNO (95%CI) | p | n | Percent change in FeNO (95%CI) | p | n | Percent change in FeNO (95%CI) | p |
| Lag 0-6h | 89 | 1.1 (1.0 , 1.3) | 0.01 | 89 | 1.1 (1.0 , 1.3) | 0.02 | 89 | 1.1 (1.0 , 1.3) | 0.02 | 73 | 1.2 (1.0 , 1.3) | 0.02 |
| Lag 7-12h | 89 | 1.1 (1.0 , 1.3) | 0.06 | 89 | 1.1 (1.0 , 1.3) | 0.07 | 89 | 1.1 (1.0 , 1.3) | 0.07 | 73 | 1.2 (1.1 , 1.4) | 0.01 |
| Lag 13-24h | 89 | 1.0 (0.9 , 1.1) | 0.55 | 89 | 1.0 (0.9 , 1.1) | 0.55 | 89 | 1.0 (0.9 , 1.1) | 0.54 | 73 | 1.0 (0.9 , 1.1) | 0.91 |
| Lag 0-24h | 89 | 1.0 (1.0 , 1.1) | 0.45 | 89 | 1.0 (0.9 , 1.1) | 0.52 | 89 | 1.0 (0.9 , 1.1) | 0.53 | 73 | 1.0 (0.9 , 1.2) | 0.49 |
| Lag 25-48h | 86 | 1.0 (0.9 , 1.1) | 0.47 | 86 | 1.0 (0.9 , 1.1) | 0.49 | 86 | 1.0 (0.9 , 1.1) | 0.47 | 70 | 1.0 (0.9 , 1.1) | 0.75 |
| Lag 49-72h | 83 | 1.1 (1.0 , 1.2) | 0.06 | 83 | 1.1 (1.0 , 1.3) | 0.09 | 83 | 1.1 (1.0 , 1.3) | 0.09 | 67 | 1.1 (0.9 , 1.2) | 0.44 |
| Lag 73-96h | 80 | 1.1 (1.0 , 1.3) | 0.06 | 80 | 1.1 (1.0 , 1.3) | 0.07 | 80 | 1.1 (1.0 , 1.3) | 0.07 | 64 | 1.1 (0.9 , 1.2) | 0.32 |

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| --- | --- | --- | --- | --- |
| **Table 4.** Percent changes in FeNO per log-transformed IQR increase in BC at different lag periods | | | | |
| Note: All estimates are from linear mixed effect model to reflect percent changes in FeNO per IQR increase in log-transformed BC. The IQR (μg/m3) was 1.8 for lag 0-6h, 1.8 for lag 7-12h, 1.2 for lag 13-24h, 1.1 for lag 0-24h, 1.5 for lag 25-48h, 1.6 for lag 49-72h and 1.3 for lag 73-96h. | | | | |
| *a* Model 1 was the unadjusted model | |  |  |  |
| *b* Model 2 adjusted for day-of-week and week number when FeNO data were collected | | | | |
| *c* Model 3 further adjusted for age, gender and race | | |  |  |
| *d* Model 4 further adjusted for NO2 |  |  |  |  |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Table 5.** Percent Change of NOS3 DNA Methylation per log-transformed IQR increase in BC by lag periods | | | | | | | | | | |
|  |  |  |  |  |  |  |  |  |  |  |
| Lag period | NOS3 Gene loci | Model 1 | |  | Model 2 | |  | Model 3 | |  |
| n | Difference in % methylation (95%CI) | p | n | Difference in % methylation (95%CI) | p | n | Difference in % methylation (95%CI) | p |
| Lag 0-6h | Position 1 | 86 | -3.7 (-7.0 , -0.5) | 0.03 | 86 | -3.3 (-6.8 , 0.1) | 0.06 | 67 | -4.9 (-9.7 , -0.1) | 0.05 |
|  | Position 2 | 86 | -1.2 (-4.5 , 2.0) | 0.45 | 86 | -0.4 (-3.8 , 3.1) | 0.84 | 67 | 1.8 (-3.9, 7.4) | 0.54 |
|  | Position 3 | 86 | -1.7 (-5.4 , 2.0) | 0.37 | 86 | -1.3 (-5.2 , 2.7) | 0.53 | 67 | 1.0 (-4.3 , 6.3) | 0.70 |
|  | Average | 86 | -2.2 (-5.0 , 0.6) | 0.12 | 86 | -1.6 (-4.5 , 1.4) | 0.29 | 67 | -0.7 (-4.9 , 3.5) | 0.74 |
| Lag 7-12h | Position 1 | 86 | -6.4 (-9.6 , -3.2) | <0.01 | 86 | -6.5 (-9.9 , -3.1) | <0.01 | 67 | -7.1 (-11.8 , -2.5) | <0.01 |
|  | Position 2 | 86 | -4.4 (-7.7 , -1.1) | 0.01 | 86 | -3.9 (-7.5 , -0.3) | 0.03 | 67 | -3.5 (-9.1 , 2.1) | 0.21 |
|  | Position 3 | 86 | -4.7 (-8.5 , -0.8) | 0.02 | 86 | -4.4 (-8.5 , -0.3) | 0.04 | 67 | -2.9 (-8.1 , 2.3) | 0.27 |
|  | Average | 86 | -5.3 (-8.0 , -2.6) | <0.01 | 86 | -5.5 (-8.4 , -2.6) | <0.01 | 67 | -4.6 (-8.6 , -0.5) | 0.03 |
| Lag 13-24h | Position 1 | 86 | -7.0 (-9.8 , -4.1) | <0.01 | 86 | -6.6 (-9.5 , -3.7) | <0.01 | 67 | -8.1 (-11.7 , -4.6) | <0.01 |
|  | Position 2 | 86 | -4.5 (-7.5 , -1.4) | <0.01 | 86 | -4.1 (-7.2 , -1.0) | 0.01 | 67 | -4.1 (-8.5 , 0.4) | 0.07 |
|  | Position 3 | 86 | -1.9 (-5.4 , 1.6) | 0.28 | 86 | -1.1 (-4.7 , 2.5) | 0.53 | 67 | 0.4 (-3.8 , 4.6) | 0.84 |
|  | Average | 86 | -4.6 (-7.0 , -2.1) | <0.01 | 86 | -4.4 (-6.9 , -1.8) | <0.01 | 67 | -3.3 (-6.6 , 0.0) | 0.05 |
| Lag 0-24h | Position 1 | 86 | -5.7 (-8.3 , -3.2) | <0.01 | 86 | -5.4 (-8.1 , -2.8) | <0.01 | 67 | -6.8 (-10.3 , -3.3) | <0.01 |
|  | Position 2 | 86 | -3.1 (-5.7 , -0.5) | 0.02 | 86 | -2.7 (-5.5 , 0.0) | 0.05 | 67 | -2.2 (-6.4 , 2.1) | 0.31 |
|  | Position 3 | 86 | -2.4 (-5.5 , 0.6) | 0.11 | 86 | -2.0 (-5.2 , 1.2) | 0.22 | 67 | -0.1 (-4.1 , 3.9) | 0.97 |
|  | Average | 86 | -3.7 (-5.8 , -1.5) | <0.01 | 86 | -3.7 (-6.0 , -1.5) | <0.01 | 67 | -2.7 (-5.8 , 0.4) | 0.09 |
| Lag 25-48h | Position 1 | 83 | -1.9 (-5.4 , 1.5) | 0.26 | 83 | -2.3 (-5.7 , 1.2) | 0.20 | 66 | -2.5 (-6.7 , 1.7) | 0.24 |
|  | Position 2 | 83 | -0.4 (-4.1 , 3.3) | 0.83 | 83 | -0.4 (-4.2 , 3.3) | 0.81 | 66 | 0.3 (-4.5 , 5.1) | 0.90 |
|  | Position 3 | 83 | 1.8 (-2.1 , 5.8) | 0.36 | 83 | 1.4 (-2.7 , 5.4) | 0.50 | 66 | 1.7 (-2.8 , 6.1) | 0.46 |
|  | Average | 83 | -0.5 (-3.5 , 2.5) | 0.74 | 83 | -0.5 (-3.6 , 2.5) | 0.73 | 66 | -0.1 (-3.7 , 3.5) | 0.95 |
| Lag 49-72h | Position 1 | 80 | 0.0 (-3.7 , 3.7) | 0.99 | 80 | -0.4 (-4.5 , 3.6) | 0.84 | 63 | 0.2 (-5.3 , 5.7) | 0.94 |
|  | Position 2 | 80 | 0.2 (-3.8 , 4.1) | 0.93 | 80 | 0.5 (-3.8 , 4.9) | 0.80 | 63 | 4.2 (-2.1 , 10.4) | 0.19 |
|  | Position 3 | 80 | -1.9 (-6.2 , 2.4) | 0.39 | 80 | -2.4 (-7.1 , 2.2) | 0.30 | 63 | -0.5 (-6.4 , 5.4) | 0.87 |
|  | Average | 80 | -0.8 (-4.1 , 2.5) | 0.62 | 80 | -0.8 (-4.3 , 2.8) | 0.67 | 63 | 1.3 (-3.4 , 6.0) | 0.58 |
| Lag 73-96h | Position 1 | 77 | -0.6 (-4.4 , 3.1) | 0.74 | 77 | -0.8 (-4.6 , 3.1) | 0.69 | 62 | -0.4 (-5.0 , 4.2) | 0.87 |
|  | Position 2 | 77 | -2.0 (-5.7 , 1.6) | 0.27 | 77 | -2.0 (-5.8 , 1.8) | 0.30 | 62 | -1.5 (-6.6 , 3.6) | 0.56 |
|  | Position 3 | 77 | -3.6 (-7.7 , 0.5) | 0.08 | 77 | -4.0 (-8.3 , 0.2) | 0.06 | 62 | -3.6 (-8.4 , 1.2) | 0.14 |
|  | Average | 77 | -2.4 (-5.4 , 0.7) | 0.13 | 77 | -2.6 (-5.7 , 0.8) | 0.13 | 62 | -1.9 (-5.8 , 2.0) | 0.33 |
|  |  |  |  |  |  |  |  |  |  |  |

Note: All estimates are from linear mixed effect model to reflect percent changes in methylation per IQR increase in log-transformed BC. The IQR (μg/m3) was 1.8 for lag 0-6h, 1.8 for lag 7-12h, 1.2 for lag 13-24h, 1.1 for lag 0-24h, 1.5 for lag 25-48h, 1.6 for lag 49-72h and 1.3 for lag 73-96h.

*a* Model 1 was the unadjusted model

*b* Model 2 adjusted for day-of-week and week number when buccal cells were collected

*c* Model 3 further adjusted for age, gender and race