|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Supplementary Table 1. Mass transitions and retention times for steroid hormones** | | | | | |
|  |  |  |  |  |  |
| **Analyte** | **Quantifier MRM** | **Qualifier MRM** | **Retention Time (min)** |  |  |
| E2(PS) | 414.3 > 350.1 | 414.3 > 272.1 | 5.71 |  |  |
| 13C3-E2(PS) | 417.3 > 353.1 | 417.3 > 275.1 | 5.71 |  |  |
| E1(PS) | 412.1 > 348.1 | 412.1 > 270.1 | 5.46 |  |  |
| 13C3-E1(PS) | 415.1 > 351.1 | 415.1 > 273.1 | 5.46 |  |  |
| E3(PS) | 430.1 > 366.1 | 430.1 > 288.1 | 4.39 |  |  |
| 13C3-E3(PS) | 433.1 > 369.1 | 433.1 > 291.1 | 4.39 |  |  |
| P | 315.1 > 97.1 | 315.1 > 109.1 | 5.40 |  |  |
| 13C3-P | 318.2 > 100.0 | 318.2 > 112.1 | 5.40 |  |  |
| T | 289.2 > 97.0 | 289.2 > 109.0 | 4.50 |  |  |
| 13C3-T | 292.2 > 100.0 | 292.2 > 112.0 | 4.50 |  |  |
| DHEA | 271.0 > 213.0 | 271.0 > 253.0 | 4.63 |  |  |
| A4 | 287.2 > 97.1 | 287.2 > 109.1 | 4.21 |  |  |
| E2=Estradiol, E1=Estrone, E3=Estriol, Pg=Progesterone,T=Testosterone,A4=Androstenedione | | | | | |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Supplementary Table 2. Coefficients of variation for steroid hormones at various concentrations** | | | | | | |
|  |  |  |  |  |  |  |
|  | **Interassay CV% at three levels, N=11** | | | | | |
|  | **Low** | | **Middle** | | **High** | |
| Analyte | Concentration | % CV | Concentration | % CV | Concentration | % CV |
| E2 | 56.9 pg/mL | 18.0 | 96.5 pg/mL | 13.8 | 363.1 pg/mL | 11.3 |
| E1 | No controls had values >LOD | | | | | |
| E3 | 1744.1 pg/mL | 10.2 | 6489.8 pg/mL | 11.3 | 15286.4 pg/mL | 6.4 |
| P | 2.0 ng/mL | 8.7 | 8.0 ng/mL | 5.6 | 29.1 ng/mL | 6.8 |
| T | 71.6 ng/dL | 13.7 | 176.8 ng/dL | 14.1 | 634.3 ng/dL | 7.3 |
| DHEA | 5.3 ng/mL | 18.0 | 8.9 ng/mL | 8.6 | 13.0 ng/mL | 8.3 |
| A4 | 1.4 ng/mL | 16.9 | 3.0 ng/mL | 13.1 | 7.4 ng/mL | 10.4 |
| E2=Estradiol, E1=Estrone, E3=Estriol, Pg=Progesterone, F=Cortisol, T=Testosterone, A4=Androstenedione | | | | | | |

|  |  |  |
| --- | --- | --- |
| **Supplementary Table 3. Correlation between age at blood draw (in hours) and sex steroid hormones** | | |
|  |  | Age at blood draw (in hours) |
| Androstenedione | r2 | 0.0948 |
|  | Sig. (2-tailed) | 0.000 |
|  | n | 325 |
| Testosterone | r2 | 0.1295 |
|  | Sig. (2-tailed) | 0.000 |
|  | n | 325 |
| DHEA | r2 | 0.0330 |
|  | Sig. (2-tailed) | 0.001 |
|  | n | 325 |
| Estradiol | r2 | 0.0020 |
|  | Sig. (2-tailed) | 0.4265 |
|  | n | 325 |
| Estrone | r2 | 0.0094 |
|  | Sig. (2-tailed) | 0.0804 |
|  | n | 325 |
| Estriol | r2 | 0.0199 |
|  | Sig. (2-tailed) | 0.0108 |
|  | n | 325 |
| Progesterone | r2 | 0.2642 |
|  | Sig. (2-tailed) | 0.000 |
|  | n | 325 |

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Supplementary Table 4. Descriptive statistics of sex steroid hormones by case status, race/ethnicity, and decade of birth** | | | | | | |
|  |  | | | | | |
|  | **Androstenedione (LOD=1 ng/mL)** | **DHEA (LOD=4 ng/dL)** | **Estradiol (LOD=50 pg/mL)** | **Estriol (LOD=200 pg/mL)** | **Estrone (LOD=100 pg/mL)** | **Testosterone (LOD=50 ng/dL)** |
| ***By Case Status*** |  |  |  |  |  |  |
| ***Cases*** |  |  |  |  |  |  |
| mean | 1.93 | 11.6 | 13.6 | 2132 | 34.2 | 113 |
| median | 1.68 | 7.18 | 10.4 | 1102 | 26.2 | 88.7 |
| std dev | 1.07 | 14.1 | 13.1 | 3283 | 34.6 | 88.0 |
| min | 0.41 | 0.29 | 0.02 | 14.44 | 0.81 | 0.72 |
| max | 6.60 | 150 | 129 | 29214 | 336 | 527 |
|  |  |  |  |  |  |  |
| ***Controls Only*** |  |  |  |  |  |  |
| mean | 1.98 | 12.3 | 18.7 | 1916 | 48.7 | 112 |
| median | 1.65 | 7.19 | 14.3 | 950 | 34.2 | 90.9 |
| std dev | 1.42 | 15.2 | 23.6 | 2930 | 56.3 | 93.9 |
| min | 0.18 | 0.13 | 0.24 | 0.95 | 0.12 | 5.57 |
| max | 8.96 | 106 | 359 | 26582 | 414 | 587 |
|  |  |  |  |  |  |  |
| p-value (ttest, comparing cases v controls) | 0.62 | 0.52 | 0.00 | 0.36 | 0.00 | 0.86 |
|  |  |  |  |  |  |  |
| ***By Race/Ethnicity*** |  |  |  |  |  |  |
| **Non-Hispanic White** |  |  |  |  |  |  |
| mean | 1.72 | 10.7 | 19.9 | 1698 | 55.1 | 114 |
| median | 1.34 | 6.84 | 17.5 | 816 | 45.1 | 92.0 |
| std dev | 1.14 | 12.1 | 17.1 | 2985 | 67.3 | 99.7 |
| min | 0.19 | 0.13 | 0.24 | 0.95 | 0.12 | 7.18 |
| max | 7.52 | 87.1 | 135 | 26582 | 414 | 502 |
|  |  |  |  |  |  |  |
| **Hispanic** |  |  |  |  |  |  |
| mean | 2.03 | 12.8 | 16.5 | 2015 | 46.8 | 108 |
| median | 1.70 | 7.25 | 13.1 | 985 | 32.9 | 89.4 |
| std dev | 1.46 | 15.0 | 13.4 | 2980 | 52.8 | 87.1 |
| min | 0.18 | 0.46 | 0.28 | 7.75 | 0.51 | 5.57 |
| max | 8.35 | 102 | 87.1 | 19385 | 327 | 587 |
|  |  |  |  |  |  |  |
| **Non-Hispanic Black** |  |  |  |  |  |  |
| mean | 2.28 | 8.26 | 11.9 | 4140 | 25.2 | 70.5 |
| median | 2.19 | 10.8 | 9.79 | 3439 | 29.0 | 82.7 |
| std dev | 1.70 | 5.92 | 12.5 | 3572 | 7.05 | 24.6 |
| min | 0.63 | 1.50 | 0.66 | 971 | 17.0 | 42.2 |
| max | 4.02 | 12.5 | 25.3 | 8010 | 29.5 | 86.6 |
|  |  |  |  |  |  |  |
| **Non-Hispanic Asian** |  |  |  |  |  |  |
| mean | 2.29 | 11.7 | 33.1 | 1432 | 40.3 | 140 |
| median | 1.92 | 7.12 | 17.5 | 870 | 37.4 | 94.5 |
| std dev | 1.71 | 17.5 | 69.6 | 1564 | 29.2 | 125 |
| min | 0.65 | 2.19 | 0.92 | 39.2 | 4.59 | 30.8 |
| max | 8.96 | 91.8 | 359 | 6066 | 95.8 | 523 |
|  |  |  |  |  |  |  |
| **Non-Hispanic Other** |  |  |  |  |  |  |
| mean | 3.64 | 37.5 | 15.9 | 3888 | 38.0 | 118 |
| median | 3.69 | 12.0 | 17.7 | 1714 | 42.2 | 94.5 |
| std dev | 2.26 | 43.8 | 7.13 | 4073 | 26.5 | 70.3 |
| min | 1.35 | 3.99 | 4.09 | 546 | 7.04 | 45.6 |
| max | 5.97 | 106 | 23.4 | 8717 | 70.9 | 214 |
|  |  |  |  |  |  |  |
| p-value (ttest, comparing White v Hispanic) | 0.05 | 0.20 | 0.05 | 0.37 | 0.23 | 0.57 |
|  |  |  |  |  |  |  |
| ***By Decade of Birth*** |  |  |  |  |  |  |
| **1982-1990** |  |  |  |  |  |  |
| mean | 1.74 | 11.3 | 20.0 | 2032 | 52.1 | 97.8 |
| median | 1.43 | 7.21 | 17.2 | 950 | 40.0 | 77.4 |
| std dev | 1.23 | 14.0 | 27.3 | 3029 | 58.2 | 86.4 |
| min | 0.18 | 0.13 | 0.24 | 0.95 | 0.51 | 5.57 |
| max | 8.35 | 106 | 359 | 26582 | 414 | 587 |
|  |  |  |  |  |  |  |
| **1991-1999** |  |  |  |  |  |  |
| mean | 2.46 | 14.3 | 16.0 | 1938 | 40.9 | 143 |
| median | 2.04 | 7.30 | 12.5 | 1080 | 29.6 | 129 |
| std dev | 1.65 | 17.4 | 16.2 | 3068 | 47.7 | 102 |
| min | 0.28 | 2.08 | 0.84 | 10.1 | 0.12 | 8.77 |
| max | 8.96 | 91.8 | 135 | 19385 | 375 | 523 |
|  |  |  |  |  |  |  |
| **2000-2009** |  |  |  |  |  |  |
| mean | 2.02 | 13.4 | 18.6 | 1050 | 50.7 | 113 |
| median | 1.43 | 6.96 | 14.3 | 657 | 31.3 | 89.4 |
| std dev | 1.43 | 15.2 | 13.8 | 1189 | 67.2 | 94.4 |
| min | 0.61 | 2.56 | 0.92 | 20.1 | 1.91 | 16.8 |
| max | 6.94 | 77.6 | 57.2 | 5802 | 327 | 440 |
|  |  |  |  |  |  |  |
| p-value (ttest, comparing1982-1990 v 2000-2009) | 0.24 | 0.44 | 0.77 | 0.08 | 0.91 | 0.37 |