SUPPLEMENTARY
MATERIAL METHODS

Study subjects

The study was conducted with the permission of the Ethics Committee of Soonchunhyang University. Buffy coats and plasma were obtained from a biobank at Soonchunhyang University Hospital, Bucheon, Korea, and informed written consent for study participation and sample donation was obtained from each subject. Additionally, this study used fully anonymized data collected previously as part of the biobank at Soonchunhyang University Bucheon Hospital as following the table:

| Anonymized ID | Diagnosis   | Smoke | Atopy | FVC (% predicted) | FEV1 (% predicted) | FEV1_FVC (%) | Decline of FEV1 after TDI challenge (%) | Serum total IgE (kU/I) | Atopy |
|---------------|-------------|-------|-------|-------------------|-------------------|--------------|----------------------------------------|----------------------|-------|
| BC4061353     | TDI-Positive| NS    | Y     | 90                | 107               | 93           | 31.84                                  | 331                  | Y     |
| BC3950614     | TDI-positive| NS    | N     | 86                | 90                | 16           | 40.29                                  | 320                  | N     |
| BC3327599     | TDI-positive| NS    | N     | 70                | 75                | 87           | 38.27                                  | 274                  | N     |
| BC4066158     | TDI-Positive| NS    | N     | 105               | 115               | 84           | 24.29                                  | 66.7                 | N     |
| BC3942544     | TDI-Positive| ES    | N     | 99                | 93                | 71           | 45.75                                  | 40                   | N     |
| BC3758267     | TDI-positive| ES    | Y     | 87                | 81                | 72           | 27.84                                  | 347                  | Y     |
| BC3794680     | TDI-positive| NS    | Y     | 96                | 111               | 84           | 27.83                                  | 1282                 | Y     |
| BC3525833     | TDI-positive| SM    | Y     | 95                | 95                | 75           | 17.7                                   | 183                  | Y     |
| BC3463762     | TDI-Positive| ES    | N     | 92                | 102               | 85           | 25.89                                  | 191                  | N     |
| BC3459727     | TDI-positive| ES    | Y     | 85                | 87                | 79           | 17.53                                  | 3205                 | Y     |
| BC3480493     | TDI-positive| NS    | Y     | 100               | 112               | 89           | 33.58                                  | 120                  | Y     |
| BC3480172     | TDI-positive| NS    | Y     | 75                | 78                | 80           | 31.45                                  | 90.3                 | Y     |
| BC3475840     | TDI-positive| ES    | Y     | 95                | 106               | 89           | 73.33                                  | 27.2                 | Y     |
| Reference | TDI Status | Sex | Age | Height | Weight | BMI | Waist | Hip | TDI Score | p Value | R Value |
|-----------|------------|-----|-----|--------|--------|-----|-------|-----|-----------|---------|---------|
| BC3515750 | TDI-positive | NS  | 110 | 119   | 83    | 63.34 | 264   | N   |           |         |         |
| BC3537582 | TDI-positive | SM  | 84  | 90    | 81    | 52.29 | 216   | Y   |           |         |         |
| BC3521948 | TDI-positive | NS  | 96  | 89    | 74    | 20.39 | 327   | Y   |           |         |         |
| BC3550452 | TDI-positive | ES  | 76  | 67    | 67    | 42.62 | 41    | N   |           |         |         |
| BC3744205 | TDI-positive | ES  | 107 | 110   | 80    | 45.56 | 150   | N   |           |         |         |
| BC3743796 | TDI-positive | SM  | 98  | 102   | 80    | 40    | 635   | Y   |           |         |         |
| BC3788239 | TDI-positive | ES  | 73  | 69    | 74    | 27.47 | 94.7  | Y   |           |         |         |
| BC3812893 | TDI-positive | SM  | 72  | 65    | 68    | 18.5  | 319   | Y   |           |         |         |
| BC3941726 | TDI-positive | ES  | 91  | 87    | 70    | 21.96 | 1331  | Y   |           |         |         |
| BC4437715 | TDI-positive | SM  | 82  | 90    | 83    | 19.15 | 438   | Y   |           |         |         |
| BC3796012 | TDI-positive | SM  | 93  | 88    | 77    | 35.67 | 1706  | Y   |           |         |         |
| BC4048896 | TDI-positive | ES  | 73  | 63    | 71    | 34.51 | 193   | Y   |           |         |         |
| BC4059945 | TDI-negative | SM  | 61  | 65    | 81    | 5.19  | 22.8  | N   |           |         |         |
| BC3318355 | TDI-negative | NS  | 83  | 83    | 101   | 4.31  | 49    | N   |           |         |         |
| BC3741874 | TDI-negative | ES  | 84  | 92    | 77    | 3.63  | 353   | Y   |           |         |         |
| BC3431721 | TDI-negative | NS  | 80  | 86    | 86    | 4.56  | 24.8  | Y   |           |         |         |
| BC3733190 | TDI-negative | NS  | 82  | 87    | 83    | 0.93  | 72.8  | Y   |           |         |         |
| BC4058343 | TDI-negative | SM  | 102 | 85    | 66    | -1.82 | 246   | Y   |           |         |         |
| BC3333602 | TDI-negative | SM  | 81  | 94    | 89    | 8.96  | 151   | N   |           |         |         |
| BC3690463 | TDI-negative | ES  | 100 | 99    | 78    | 10.16 | 109   | Y   |           |         |         |
| BC3534518 | TDI-negative | SM  | 87  | 96    | 86    | 4.2   | 147   | N   |           |         |         |
| BC3321006 | TDI-negative | SM  | 91  | 101   | 88    | 2.02  | 141   | Y   |           |         |         |
| BC3364668 | TDI-negative | NS  | 79  | 95    | 96    | 6.87  | 57.5  | N   |           |         |         |
| Accession  | TDI Status | SM | Y/N | T/S | N/S | Score | Flag |
|------------|------------|----|-----|-----|-----|-------|------|
| BC3744141  | TDI-negative| SM | Y   | 103 | 99  | 78    | 7.47 |
| BC3748326  | TDI-negative| SM | Y   | 88  | 89  | 78    | 7.24 |
| BC3473049  | TDI-negative| ES | N   | 88  | 88  | 80    | 0.9  |
| SC4370012  | TDI-negative| SM | N   | 96  | 91  | 70    | -0.33|
| BC3735796  | TDI-negative| SM | N   | 100 | 115 | 91    | 0.63 |
| BC3603726  | TDI-negative| ES | N   | 105 | 88  | 60    | 10.89|
| BC3809095  | TDI-negative| ES | Y   | 100 | 99  | 76    | 11.48|
| BC3474910  | TDI-negative| NS | Y   | 88  | 100 | 85    | -0.45|
| BC3295519  | TDI-negative| ES | Y   | 108 | 107 | 75    | -2.8 |
| BC4326814  | TDI-negative| ES | Y   | 88  | 92  | 80    | 5.86 |
| BC4315462  | TDI-negative| ES | Y   | 98  | 102 | 74    | 6.96 |
| BC3414836  | TDI-negative| NS | N   | 125 | 130 | 77    | 7.3  |
| BC4230514  | TDI-negative| SM | Y   | 108 | 116 | 85    | 4.83 |
| BC4303207  | TDI-negative| SM | Y   | 98  | 110 | 83    | 3.99 |
| BC3680083  | TDI-negative| ES | N   | 94  | 113 | 94    | 7.61 |
| BC4326814  | TDI-negative| ES | Y   | 88  | 92  | 80    | 5.86 |
| BC4315462  | TDI-negative| ES | Y   | 98  | 102 | 74    | 6.96 |
| BC3414836  | TDI-negative| NS | N   | 125 | 130 | 77    | 7.3  |
| BC4230514  | TDI-negative| SM | Y   | 108 | 116 | 85    | 4.83 |
| BC4303207  | TDI-negative| SM | Y   | 98  | 110 | 83    | 3.99 |
| BC3680083  | TDI-negative| ES | N   | 94  | 113 | 94    | 7.61 |