

Supplementary Table S1 The 18 food groups on the maternal food frequency questionnaire and their associated loadings for the top principal component (PC1, explained 17.5% of variance)

Food or food group	Loading values
Deep fried foods	0.38
Processed meats	0.36
Baked products	0.24
Beef, pork, or lamb as the main dish	0.24
Margarine	0.21
Whole milk dairy foods	0.15
Added salt	0.14
Pasta, rice, or noodles	0.09
Whole eggs	0.06
Citrus fruits	−0.004
Fish or seafood	−0.02
Other fruits such as apples or pears	−0.21
Broccoli, cauliflower, cabbage, or Brussels sprouts	−0.22
Low-fat milk products	−0.26
Other vegetables such as peas or corn	−0.28
Whole grain foods	−0.28
Carrots	−0.29
Dark green leafy vegetables	−0.33

Supplementary Table S2 Assay parameters for C-reactive protein protein and interleukin-8 plasma measurements

Biomarker	Assay manufacturer and principle	Assay linearity range	Assay LLD	Samples in % >LLD	Sample dilution	Samples range (min–max)	CV (%)
C-Reactive protein ^a	Meso Scale Discovery Electrochemiluminescence	200,000–2.6 pg/mL	1.49 pg/mL	100%	500x, 2,500x	0.1414–99.71 mg/L	5.036
Interleukin-8	Immunoassay	592–0.146 pg/mL	0.0308 pg/mL	100%	2x, 50x	0.5–13,301 pg/mL	6.98

Abbreviations: CV, coefficient of variation; LLD, lower limit of detection.

^aThis assay was calibrated against the National Institute for Biological Standards and Control (NIBSC) World Health Organization standard 85/506. 1 mg/L in this assay = 964 IU of 86/506.

Supplementary Table S3 Clinical characteristics of 36 patients with preterm births

	Gestational age at birth (wk)	Spontaneous or induced labor	Birth mode	Potential contributory factors	Other distinguishing characteristics
	36.3	Induction	Vaginal	Oligohydramnios	
	36.3	Induction	Vaginal		Cholestasis of pregnancy, perinatal antibiotics
	35.3	Induction	Vaginal	Preeclampsia	IUGR/SGA, perinatal antibiotics
	34.8	Induction	Vaginal	PPROM	
	36.0	Induction	Vaginal		Perinatal antibiotics
	36.7	Induction	Vaginal		Perinatal antibiotics
	36.3	Induction	Vaginal	Preeclampsia	Perinatal antibiotics
	31.0	Induction	C-section	Preeclampsia	Prolapsed cord, perinatal antibiotics
	35.3	Induction	C-section	Preeclampsia	Perinatal antibiotics
	36.9	Induction	Vaginal		IUGR/SGA
	36.4	Induction	Vaginal	Preeclampsia	Perinatal antibiotics
	36.4	No labor (C-section)	C-section	Oligohydramnios	SGA, perinatal antibiotics
	36.9	Spontaneous	Vaginal		
	26.7	Spontaneous	Vaginal		Perinatal antibiotics
	36.4	Spontaneous	Vaginal		
	33.9	Spontaneous	Vaginal	PPROM	Perinatal antibiotics
	36.3	Spontaneous	Vaginal		Hematuria, possible bladder stone
	36.6	Spontaneous	Vaginal		Gestational diabetes
	36.3	Spontaneous	Vaginal	PPROM	
	34.7	Spontaneous	C-section	PPROM	Non-reassuring tracings, single umbilical artery, perinatal antibiotics
	36.6	Spontaneous	Vaginal		
	36.6	Spontaneous	Vaginal	PPROM	
	36.3	Spontaneous	Vaginal		Gestational diabetes
	36.3	Spontaneous	Vaginal	PPROM	Perinatal antibiotics
	36.3	Spontaneous	C-section		Gestational diabetes
	36.3	Spontaneous	Vaginal		Gestational diabetes
	36.9	Spontaneous	Vaginal		Perinatal antibiotics
	36.3	Spontaneous	Vaginal		Perinatal antibiotics
	35.6	Spontaneous	Vaginal		Perinatal antibiotics
	36.0	Spontaneous	Vaginal		Tight cord around neck
	32.9	Spontaneous	Vaginal		Perinatal antibiotics
	32.0	Spontaneous	Vaginal		
	35.6	Spontaneous	Vaginal	PPROM	Prolonged rupture of membranes, chorioamnionitis, perinatal antibiotics
	36.6	Spontaneous	Vaginal		Nuchal cord
	36.7	Spontaneous	Vaginal	PPROM	Perinatal antibiotics
	33.6	Spontaneous	Vaginal	PPROM, preeclampsia	Perinatal antibiotics

Abbreviations: IUGR/SGA, intrauterine growth restriction/small for gestational age; PPRM, preterm premature rupture of membranes.

Notes: Legend: preeclampsia (green), spontaneous preterm births (blue), and induced or no labor births without preeclampsia (yellow).

Patients who had preeclampsia are shown with green background; those with induced delivery are shown with yellow background and those with spontaneous preterm delivery and no preeclampsia are shown with blue background. Bolded patients had a second sample collection on or after the day of delivery and were excluded in the sensitivity analysis.

Supplementary Table S4 Baseline characteristics of patients included and excluded from analysis			
Total <i>n</i> = 816	Included (<i>n</i> = 528)	Excluded (<i>n</i> = 288)	<i>p</i> -Value
	Number (%)	Number (%)	
Maternal race/ethnicity			
Black			0.83
Hispanic	23 (4.4)	16 (5.6)	
Non-Hispanic	199 (37.7)	116 (40.3)	
Other			
Hispanic	47 (8.9)	27 (9.4)	
Non-Hispanic	39 (7.4)	21 (7.3)	
White			
Hispanic	73 (13.8)	40 (13.9)	
Non-Hispanic	147 (27.8)	68 (23.6)	
Study site			
Boston	156 (29.5)	86 (29.9)	0.33
San Diego	188 (35.6)	89 (30.9)	
St. Louis	184 (34.8)	113 (39.2)	
Treatment arm: high-dose prenatal vitamin D (4,400 IU/d)	252 (47.7)	156 (54.2)	0.09
Maternal age ≥ 35 y	42 (8.0)	19 (6.6)	0.57
	Mean (SD)	Mean (SD)	<i>p</i> -Value
Living children (total no.)	0.86 (1.0)	0.94 (1.1)	0.29
Gravidity (total no.)	2.4 (1.6)	2.4 (1.5)	0.97
Prior premature births (total no.)	0.09 (0.3)	0.14 (0.5)	0.14
Third trimester biomarker sampling time (weeks' gestation)	34.06 (1.7)	33.74 (1.7)	0.01

Abbreviations: IU, international units; SD, standard deviation.

Note: *p*-Values are for *t*-tests for continuous variables and Chi-square tests for categorical variables.

Supplementary Table S5 Baseline maternal characteristics in study population by outcome of preterm birth

Total <i>n</i> = 528	Preterm birth (<i>n</i> = 36)	Term birth (<i>n</i> = 492)	<i>p</i> -Value
	Number (%)	Number (%)	
Maternal race/ethnicity			
Black			
Hispanic	0 (0.0)	23 (4.7)	0.47
Non-Hispanic	18 (50.0)	181 (36.8)	
Other			
Hispanic	2 (5.6)	45 (9.1)	0.47
Non-Hispanic	3 (8.3)	36 (7.3)	
White			
Hispanic	3 (8.3)	70 (14.2)	0.92
Non-Hispanic	10 (27.8)	137 (27.8)	
Maternal education: less than college	22 (61.1)	312 (63.4)	
Study site			
Boston	4 (11.1)	152 (30.9)	0.01 ^a
San Diego	12 (33.3)	176 (35.8)	
St. Louis	20 (55.6)	164 (33.3)	
Treatment arm: high-dose prenatal vitamin D (4,400 IU/d)	20 (55.6)	232 (47.2)	0.42
Birth mode: C-section	5 (13.9)	141 (28.7)	0.09
Perinatal antibiotics	22 (61.1)	193 (39.2)	0.02 ^a
Any smoke exposure during pregnancy	8 (22.9)	87 (17.9)	0.61
Gestational diabetes	5 (13.9)	29 (5.9)	0.13
Maternal age ≥ 35 y	6 (16.7)	36 (7.3)	0.09
	Mean (SD)	Mean (SD)	<i>p</i> -Value
Living children (total no.)	1.03 (1.4)	0.85 (1.0)	0.44
Gravidity (total no.)	2.56 (1.7)	2.4 (1.6)	0.65
Prior premature births (total no.)	0.20 (0.4)	0.09 (0.3)	0.12
Unhealthy diet by PCA	-0.43 (2.0)	0.01 (1.8)	0.22
Frequency of uncontrolled asthma in pregnancy	0.25 (0.40)	0.09 (0.20)	0.24
Prepregnancy BMI	27.1 (6.0)	28.4 (8.0)	0.24
BMI change over pregnancy	4.7 (2.7)	5.0 (3.8)	0.63
Vitamin D level (first trimester)	21.6 (11.6)	23.6 (9.8)	0.33
Vitamin D level (third trimester)	29.8 (16.2)	32.1 (13.9)	0.40
Third trimester sampling time (weeks' gestation)	33.37 (1.55)	33.77 (1.74)	0.34

Abbreviations: BMI, body mass index; IU, international units; PCA, principal component analysis (unhealthy diet high in red meat, processed meats, baked goods, and deep-fried foods)

Note: Missingness: prepregnancy BMI (*n* = 77), BMI change over pregnancy (*n* = 98), unhealthy diet and red meat consumption by PCA (*n* = 3), vitamin D level in third trimester (*n* = 2), and smoke exposure during pregnancy (*n* = 6).

Note: *p*-Values are for *t*-tests for continuous variables and chi-square tests for categorical variables.

^aDenotes *p*-value less than predefined level of significance, $\alpha < 0.05$.

Supplementary Table S6 Association between prenatal CRP and IL-8 among different preterm birth endotypes				
	Crude results		Adjusted results	
	OR (95% CI)	p-Value	OR (95% CI)	p-Value
First-trimester log CRP				
All preterm births included (<i>n</i> = 36)	0.87 (0.66, 1.19)	0.38	0.95 (0.66, 1.38)	0.78
Excluding preeclampsia (<i>n</i> = 30)	0.87 (0.64, 1.21)	0.40	0.98 (0.67, 1.46)	0.94
Only spontaneous preterm birth (<i>n</i> = 22)	0.95 (0.67, 1.38)	0.78	1.02 (0.67, 1.58)	0.93
Third-trimester log CRP				
All preterm births included (<i>n</i> = 36)	1.14 (0.82, 1.6)	0.46	1.49 (1.02, 2.23)	0.04 ^a
Excluding preeclampsia (<i>n</i> = 30)	1.15 (0.80, 1.67)	0.45	1.58 (1.05, 2.44)	0.03 ^a
Only spontaneous preterm birth (<i>n</i> = 22)	1.65 (1.07, 2.59)	0.03 ^a	2.05 (1.28, 3.39)	<0.001 ^a
CRP increase				
All preterm births included (<i>n</i> = 36)	1.69 (0.80, 3.64)	0.17	3.06 (1.31, 7.55)	0.01 ^a
Excluding preeclampsia (<i>n</i> = 30)	1.54 (0.68, 3.55)	0.30	2.77 (1.11, 7.26)	0.03 ^a
Only spontaneous preterm birth (<i>n</i> = 22)	3.59 (1.40, 10.1)	0.01 ^a	5.90 (2.07, 19.7)	0.002 ^a
First-trimester log IL-8				
All preterm births included (<i>n</i> = 36)	1.08 (0.84, 1.32)	0.48	1.06 (0.77, 1.38)	0.66
Excluding preeclampsia (<i>n</i> = 30)	1.13 (0.89, 1.38)	0.26	1.11 (0.79, 1.43)	0.51
Only spontaneous preterm birth (<i>n</i> = 22)	0.90 (0.57, 1.22)	0.58	0.96 (0.61, 1.34)	0.84
Third-trimester log IL-8				
All preterm births included (<i>n</i> = 36)	1.17 (0.89, 1.48)	0.20	1.20 (0.90, 1.54)	0.18
Excluding preeclampsia (<i>n</i> = 30)	1.11 (0.78, 1.43)	0.50	1.13 (0.79, 1.51)	0.46
Only spontaneous preterm birth (<i>n</i> = 22)	1.23 (0.90, 1.57)	0.13	1.22 (0.89, 1.62)	0.17
IL-8 increase				
All preterm births included (<i>n</i> = 36)	1.94 (0.94, 4.14)	0.1	1.74 (0.77, 4.07)	0.19
Excluding preeclampsia (<i>n</i> = 30)	1.59 (0.72, 3.59)	0.25	1.21 (0.50, 2.98)	0.67
Only spontaneous preterm birth (<i>n</i> = 22)	1.84 (0.77, 4.60)	0.18	1.63 (0.63, 4.50)	0.32

Abbreviations: CI, confidence interval; CRP, C-reactive protein; IL-8, interleukin-8; OR, odds ratio.

Note: Results are from univariate and multivariate logistic regression analyses.

Supplementary Table S7 CRP and IL-8 as nonsignificant mediators in the association between prepregnancy BMI or smoke exposure and preterm birth

Independent variable	Mediator	Direct effect on preterm birth ^a	Indirect effect on preterm birth ^b	Proportion mediated ^c
Prepregnancy BMI	First trimester CRP	−0.02 (−0.08, 0.04) <i>p</i> = 0.60	−0.003 (−0.03, 0.03) <i>p</i> = 0.78	0.10 (−4.5, 4.6) <i>p</i> = 0.85
Prepregnancy BMI	Third Trimester CRP	−0.04 (−0.10, 0.02) <i>p</i> = 0.17	0.02 (−0.002, 0.04) <i>p</i> = 0.05 ^d	−0.45 (−8.0, 9.3) <i>p</i> = 0.52
Prepregnancy BMI	First trimester IL-8	−0.02 (−0.07, 0.03) <i>p</i> = 0.47	−0.0004 (−0.004, 0.0) <i>p</i> = 0.77	0.002 (−0.33, 0.47) <i>p</i> = 0.91
Prepregnancy BMI	Third Trimester IL-8	−0.02 (−0.08, 0.03) <i>p</i> = 0.36	0.002 (−0.001, 0.01) <i>p</i> = 0.28	−0.03 (−0.99, 0.99) <i>p</i> = 0.60
Smoke exposure	First trimester CRP	0.001 (−0.06, 0.08) <i>p</i> = 0.98	−0.001 (−0.06, 0.00) <i>p</i> = 0.77	0.003 (−0.61, 0.89) <i>p</i> = 0.91
Smoke exposure	Third Trimester CRP	−0.002 (−0.06, 0.08) <i>p</i> = 0.91	0.001 (−0.06, 0.01) <i>p</i> = 0.77	0.001 (−1.00, 0.97) <i>p</i> = 0.97
Smoke exposure	First trimester IL-8	−0.002 (−0.06, 0.08) <i>p</i> = 0.93	0.001 (−0.003, 0.01) <i>p</i> = 0.68	0.0001 (−0.85, 1.10) <i>p</i> = 0.97
Smoke exposure	Third Trimester IL-8	−0.0002 (−0.06, 0.08) <i>p</i> = 0.88	0.001 (−0.002, 0.01) <i>p</i> = 0.53	−0.0004 (−0.81, 0.99) <i>p</i> = 0.99

Abbreviations: BMI, body mass index; CRP, C-reactive protein; IL-8, interleukin-8

^aDirect effect = the effect of an independent variable on the outcome, controlling for the mediator, reported as estimate (95% confidence interval) and associated *p*-value.^bIndirect effect = average mediator effect, reported as estimate (95% confidence interval) and associated *p*-value^cProportion mediated = proportion of the effect of an independent variable on the outcome through the mediator (indirect effect/total effect), reported as the proportion (95% confidence interval) and associated *p*-value.**Supplementary Table S8** Biomarker measurements for patients who had samples collected on or after the day of delivery

Timepoint of second sample collection	Gestational age at delivery (wk)	First CRP measurement (mg/L)	Second CRP measurement (mg/L)	First IL-8 measurement (pg/mL)	Second IL-8 measurement (pg/mL)
Day of delivery	26.7	0.65	3.4	3.0	3.4
Day of delivery	31.0	11.6	5.5	2.6	2.6
1-d after delivery	32.0	2.2	99.7	1.1	1.0
2-d after delivery	39.9	5.1	20.2	2.3	12.5
2-d after delivery	32.9	4.4	24.6	13.3	1.7

Abbreviations: CRP, C-reactive protein; IL-8, interleukin-8.

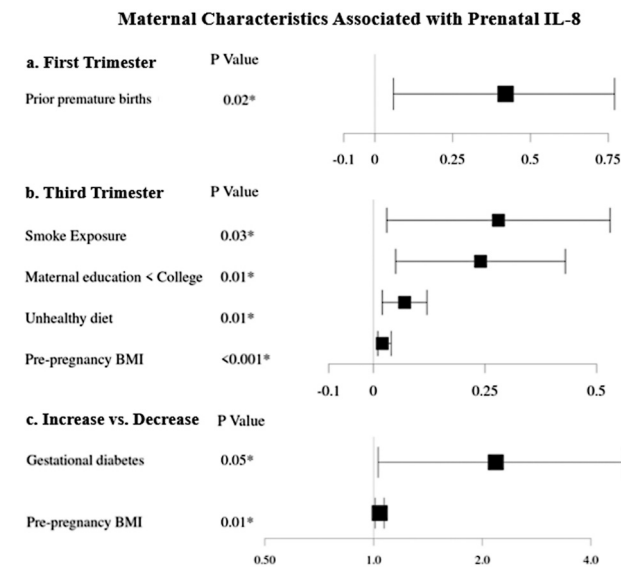
Supplementary Table S9 Association of prenatal CRP with baseline maternal characteristics and preterm birth after exclusion of patients with second CRP measurement on or after day of delivery				
Association by linear regression model	First-trimester log(CRP) <i>n</i> = 523		Third-trimester log(CRP) <i>n</i> = 523	
	β (95% CI)	<i>p</i> -Value	β (95% CI)	<i>p</i> -Value
Maternal age ≥ 35 y	−0.10 (−0.45, 0.25)	0.58	−0.16 (−0.49, 0.16)	0.32
Maternal education: less than college	0.40 (0.21, 0.60)	<0.001 ^a	0.29 (0.11, 0.47)	<0.001 ^a
Treatment arm: high-dose prenatal vitamin D (4,400 IU/d)	0.02 (−0.17, 0.21)	0.85	0.03 (−0.14, 0.21)	0.71
Prepregnancy BMI	0.08 (0.06, 0.09)	<0.001 ^a	0.05 (0.04, 0.07)	<0.001 ^a
BMI change over pregnancy	−0.03 (−0.06, 0.00)	0.09	0.01 (−0.02, 0.03)	0.68
Gravidity (total no.)	0.15 (0.09, 0.21)	<0.001 ^a	0.07 (0.02, 0.13)	0.01 ^a
Prior premature births (total no.)	0.46 (0.17, 0.76)	<0.001 ^a	0.39 (0.12, 0.66)	0.01 ^a
Living children (total no.)	0.25 (0.16, 0.34)	<0.001 ^a	0.08 (0.00, 0.17)	0.06
Birth mode: c-section	0.17 (−0.05, 0.38)	0.13	0.20 (−0.39, 0.00)	0.05
Perinatal antibiotics	−0.11 (−0.38, 0.08)	0.26	−0.07 (−0.25, 0.11)	0.44
Unhealthy diet by PCA	0.05 (0.00, 0.11)	0.05 ^a	0.07 (0.02, 0.12)	<0.001 ^a
Any smoke exposure during pregnancy	–	–	0.18 (−0.05, 0.42)	0.12
Gestational diabetes	0.43 (0.04, 0.81)	0.03 ^a	−0.05 (−0.41, 0.31)	0.79
Frequency of uncontrolled asthma in pregnancy	−0.14 (−0.89, 0.61)	0.71	0.53 (−0.17, 1.23)	0.13
Vitamin D level (first trimester)	−0.02 (−0.03, −0.01)	<0.001 ^a	−0.02 (−0.03, −0.01)	<0.001 ^a
Vitamin D level (third trimester)	–	–	−0.01 (−0.01, 0.00)	0.11
Association by Kruskal–Wallis <i>H</i> -Test	CRP in mg/L (median: 25%ile, 75%ile)	<i>p</i> -Value	CRP in mg/L (median: 25%ile, 75%ile)	<i>p</i> -Value
Maternal race/ethnicity				
Black				
Hispanic	17.8 (12.1, 38.1)		17.3 (12.5, 26.5)	
Non-Hispanic	10.0 (3.9, 20.8)		9.5 (4.6, 9.5)	
Other				
Hispanic	10.6 (6.6, 23.3)	<0.001 ^a	7.9 (4.8, 15.1)	<0.001 ^a
Non-Hispanic	6.9 (3.5, 10.6)		5.6 (2.7, 11.5)	
White				
Hispanic	7.7 (5.2, 16.8)		7.2 (4.0, 12.4)	
Non-Hispanic	6.6 (3.0, 14.9)		6.0 (3.5, 14.5)	
Study site				
Boston	8.8 (4.2, 21.0)	0.27	8.6 (4.4, 17.9)	0.04 ^a
San Diego	7.8 (3.7, 16.6)		6.6 (3.5, 12.7)	
St. Louis	10.5 (3.6, 19.1)		9.3 (4.3, 17.2)	
Association with preterm birth (<i>n</i> = 28)	Adjusted odds ratio (95% CI)		<i>p</i> -Value	
Log CRP: first trimester	1.05 (0.72, 1.56)		0.79	
Log CRP: third trimester	1.38 (0.91, 2.10)		0.13	
CRP increase	2.91 (1.21, 7.30)		0.02 ^a	

Abbreviations: BMI, body mass index; CI, confidence interval; IU, international units; PCA, principal component analysis (unhealthy diet high in red meat, processed meats, baked goods, and deep-fried foods); SD, standard deviation.

Notes: Missingness: prepregnancy BMI (*n* = 76), BMI change over pregnancy (*n* = 97), unhealthy diet and red meat consumption by PCA (*n* = 1), vitamin D level in third trimester (*n* = 2), and smoke exposure during pregnancy (*n* = 6).

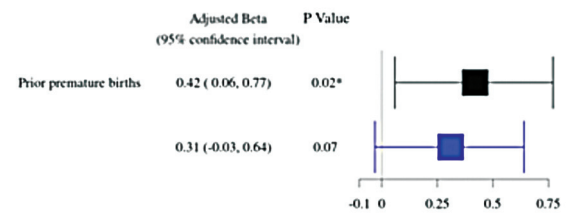
Models were adjusted for study site, maternal race/ethnicity, prepregnancy BMI, and any prenatal smoke exposure. Models for biomarker change over pregnancy were additionally adjusted for baseline biomarker value.

^aDenotes *p*-value less than predefined level of significance, $\alpha < 0.05$.

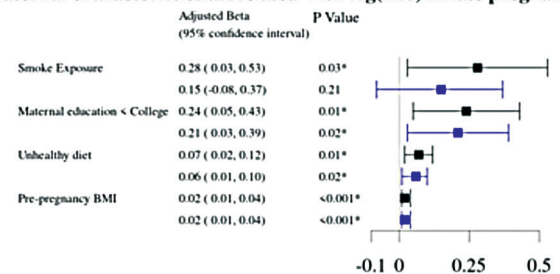


Supplementary Fig. S1 Forest plots depicting the model estimates and 95% confidence intervals of maternal characteristics that were significantly associated with (A) first-trimester log(IL-8) as determined by univariate linear regression (B) third-trimester log(IL-8) as determined by univariate linear regression and c) an increase in IL-8 over pregnancy as determined by logistic regression adjusted for baseline IL-8 level. Maternal characteristics are ordered from highest to lowest β coefficient (A, B) or odds ratio (C). Unhealthy diet was based on principal component analysis of food frequency questionnaire data with higher scores characterized by higher consumption of red or processed meats, baked products, and deep-fried foods. * Denotes p -value less than predefined level of significance, $\alpha < 0.05$

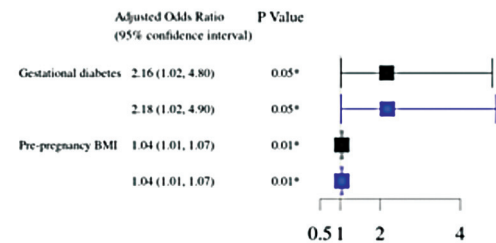
Maternal characteristics associated with log(IL8) at baseline



Maternal characteristics associated with log(IL8) in late pregnancy

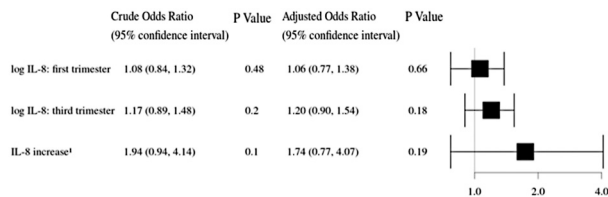


Maternal characteristics associated with IL-8 increase



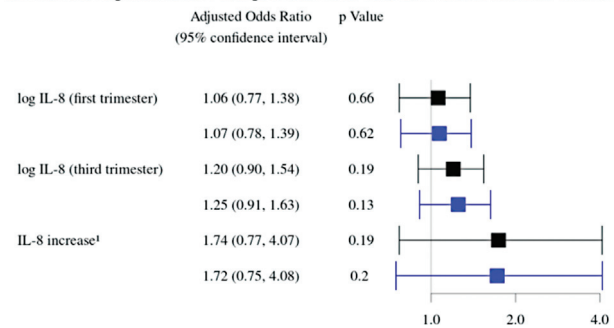
Supplementary Fig. S2 Forest plots depicting the model estimates and 95% confidence intervals with (black) and without (blue) outliers with extreme IL-8 values ($>10,000$ pg/L) of maternal characteristics and the association with first-trimester log(IL-8) as determined by univariate linear regression (top), third-trimester log(IL-8) as determined by univariate linear regression (middle), and an increase in IL-8 over pregnancy as determined by logistic regression adjusted for baseline IL-8 level (bottom). Maternal characteristics are ordered from highest to lowest β coefficient (top, middle) or odds ratio (bottom). Unhealthy diet was based on principal component analysis of food frequency questionnaire data with higher scores characterized by higher consumption of red or processed meats, baked products, and deep-fried foods. * Denotes p -value less than predefined level of significance, $\alpha < 0.05$.

Association of prenatal IL-8 and all preterm births

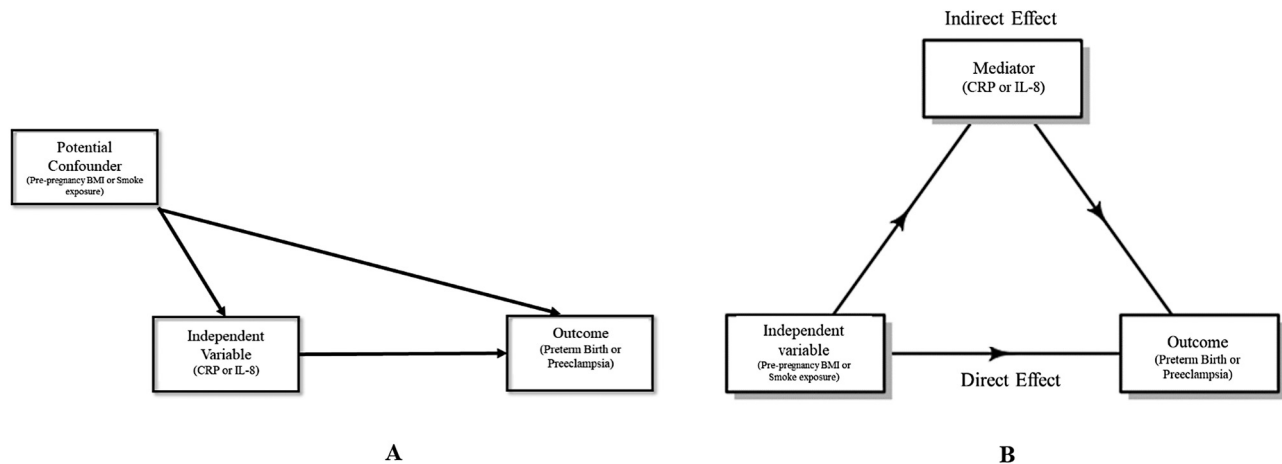


Supplementary Fig. S3 Forest plots depicting the odds ratio and 95% confidence intervals obtained from logistic regression models of associations between prenatal IL-8 with preterm birth. Five-hundred and twenty-six patients (36 with preterm birth) were included in the crude analysis and 447 patients (31 with preterm birth) were included in the adjusted analysis. Models were adjusted for study site, maternal race/ethnicity, prepregnancy BMI, and any prenatal smoke exposure.¹ Models for biomarker change over pregnancy were additionally adjusted for baseline biomarker value. [†] Denotes *p*-value less than predefined level of significance, $\alpha < 0.05$

Association of prenatal IL-8 and preterm birth with and without extreme outliers



Supplementary Fig. S4 Forest plots depicting the odds ratio and 95% confidence intervals obtained from logistic regression models of the association between prenatal IL-8 in first trimester, third trimester, and increase over pregnancy with outcomes of preterm birth. Results from models including outliers with extreme IL-8 values ($>10,000$ pg/L) are in black ($n = 528$) and results from models excluding outliers are in blue ($n = 525$). Models were adjusted for study site, maternal race/ethnicity, prepregnancy BMI, and any prenatal smoke exposure.¹ Models for biomarker change over pregnancy were additionally adjusted for the baseline value.



Supplementary Fig. S5 Directed acyclic graphs (DAG) depicting two different possible relationships between prenatal CRP or IL-8, preterm birth or preeclampsia, and prepregnancy BMI or smoke exposure. The first DAG (A) considers prepregnancy BMI and smoke exposure as potential confounders in the association between CRP or IL-8 and preterm birth or preeclampsia. The second DAG (B) considers prenatal CRP or IL-8 as a mediator in the association between prepregnancy BMI or smoke exposure and preterm birth and preeclampsia. CRP, C-reactive protein; IL, interleukin.