# Supporting Information

## Singh et al. 10.1073/pnas.1416940111

### SI Materials and Methods

**Preparation of Sulforaphane-Rich Broccoli Sprout Extracts.** Sulforaphane-rich broccoli sprout extract (SF-BSE) was prepared by the Cullman Chemoprotection Center at The Johns Hopkins University essentially as described in Egner et al. (1). In brief, specially selected broccoli seeds were surface-disinfected and grown (sprouted) for 3 d in a commercial sprouting facility under controlled light and moisture conditions. A boiling water extract was prepared, filtered, cooled, and treated with the enzyme myrosinase (from daikon sprouts) to convert precursor glucosinolates to isothiocyanates, and then lyophilized at a food processing facility (Oregon Freeze Dry, Albany, OR). The lyophilized powder (216 μmol SF/g powder) was encapsulated into #1 gelcaps by ALFA Specialty Pharmacy (Columbia, MD); each capsule contained 50 μmol SF (232 mg of SF-BSE); placebo capsules were filled with microcrystalline cellulose. The powders (bulk and capsules) were maintained at approximately −20 °C and repeatedly checked for microbial contaminants and SF titer before conveyance to the study site pharmacy (Massachusetts General Hospital) to be dispensed to patients.

**Safety and Tolerance.** Adverse event monitoring and documentation by severity, duration, and relatedness were performed by a physician at each follow-up visit. Study drug pause and stop rules were formulated as follows: In case of any significant adverse events or if laboratory values were above the study eligibility rules [i.e., alanine transaminase or aspartate transaminase > 1.5× upper limit of normal, serum creatinine > 1.2 mg/dL or thyroid stimulating hormone (TSH) outside normal limits], study medication was to be stopped for 2 wk and subjects reevaluated. If laboratory studies returned to normal and no more adverse events were noted, the medication was to be restarted. Otherwise, the study medication was to be stopped indefinitely. Study drug safety and adherence to the protocol were monitored at quarterly meetings of a Data Safety Monitoring Board constituted by three members at the Lurie Center for Autism.

**Quality of Data Certification.** An on-site Food and Drug Administration Good Clinical Practice Raw Data Audit was performed on May 19–21, 2014. The inspection was performed by Philippe Ourisson (Manager, Quality Assurance and Scientific Support), and confirmed by Paul Swidersky (President), Quality Associates, Fulton, MD.

The folder of each of the 44 subjects was reviewed. Every informed consent form was examined. All inclusion/exclusion criteria were verified. Most baseline physicals and all subject evaluations through week 22 were examined, then transcribed to a spreadsheet.

No evidence was obtained that there were significant errors in collecting the data and transferring the results to the spreadsheets.

**Statistical Analysis of Outcome Measures and Intention-to-Treat Analysis.** Our primary hypotheses concerned differences between the sulforaphane and placebo treatment groups in the average change in Abberrant Behavior Checklist (ABC) and Social Responsiveness Scale (SRS) scores from baseline to 18 wk, and their reversion to baseline at 22 wk. Clinical Global Impression Improvement Scale (CGI-I) scores were examined as a secondary outcome at the same time points.

Of the 44 subjects originally enrolled and randomized to sulforaphane treatment ($n = 29$) or placebo ($n = 15$), 4 subjects discontinued participation in the study before the first return visit, 4 wk after treatment initiation. In the main text, change scores calculated as the change from baseline to each follow-up time point for each participant were analyzed. The four participants who discontinued early were not included in the main analyses.

An alternative, intention-to-treat (ITT) analysis included all randomized participants. Each outcome was modeled in a mixed-effects general linear model with fixed effects for visit and the interaction of postrandomization visit and treatment group and random participant-specific intercepts and slopes with unstructured covariance. The absence of a main effect for treatment (i.e., a "shared baseline") properly reflects the true state of the population sampled before randomization and has the advantage of adjusting for any chance differences at baseline in a manner similar to ANCOVA. The model was used to estimate the difference between treatment and control in mean change from baseline at each time point. Given its assumptions, the mixed model yields estimates that are unbiased as long as missing test scores are predictable from observed scores. In this model, the baseline scores (the mean of scores at the screening and randomization visits) of the four participants lost to follow-up were included in the analysis, with all participants analyzed according to their assigned treatment group without regard to whether they continued treatment. The test statistic used was the difference between the two treatment groups in the average change in SRS from baseline to 18 wk. We used a two-tailed test at $\alpha = 0.05$. To quantify the change in efficacy after 4 wk without treatment we estimated the difference in the treatment-placebo comparison at 22 vs. 18 wk, by a simple linear contrast of the estimated model parameters.

By mixed model analysis of the ITT sample, the sulforaphane group had significantly greater improvement in their overall SRS and ABC scores compared with the placebo group. After 18 wk of treatment, the sulforaphane group had a reduction in SRS total score of 15.3 units from baseline compared with a decrease of 3.2 units in the placebo group (difference = 12.1 units, $P = 0.01$). After subjects stopped the medication, the SRS scores tended to revert to the mean (although incompletely), with the average decrease of SRS total score from baseline to 22 wk being 6 units in the sulforaphane group and 2.9 units in the placebo group (difference = 3.1 units, $P = 0.70$).

The effect of sulforaphane on ABC total scores was comparable, with a decrease of 17.6 units among participants randomized to active treatment compared with a decrease of 0.08 unit in the placebo group (difference = 17.5 units, $P = 0.0001$). As with SRS scores, ABC total scores also tended to revert to baseline after stopping treatment, such that the average decrease of total ABC score from baseline to 22 wk was 8.8 units in the sulforaphane group, compared with 0.08 unit in the placebo group (difference = 8.9 units, $P = 0.28$).

Guided by the power analysis and sample size calculation discussed in the main text (indicating power to detect a 15-point change in total SRS score), a positive response to treatment was defined post hoc as a 30% decrease from baseline on SRS and ABC scores. After conservatively considering the four dropouts (one on placebo and three on sulforaphane) as not meeting the 30% reduction threshold, ABC scores at 18 wk were available for 39 participants (11 placebo and 28 sulforaphane), and SRS scores at 18 wk were available for 41 participants (12 placebo and 29 sulforaphane). Additionally, three participants on sulforaphane inexplicably had >30% reduction in their ABC scores from baseline, whereas they were not improved either on CGI-I (OACIS-I) or poststudy parent interviews. These three participants were conservatively considered as not meeting the 30%

reduction threshold. With that adjustment, 31% (9 of 29) participants on sulforaphane had a positive response on SRS compared with 0% (0 of 15) participants on placebo (Fisher's exact test, $P = 0.018$). Similarly, 44.8% (13 of 29) of participants taking sulforaphane had a positive response on ABC compared with 13% (2 of 15) patients on placebo ($P = 0.048$).

Also consistent with the "per-protocol" findings reported in the main text, an ITT analysis suggested that more participants in the sulforaphane compared with the placebo group experienced a positive response on several subdomains of the CGI-I scale. After 18 wk of treatment, 41% (12 of 29) participants taking sulforaphane were "much improved" or "very much improved" on the social interaction subdomain of the CGI-I compared with 0% (0 of 15) of participants on placebo ($P = 0.003$). Forty-eight percent (14 of 29) of participants on sulforaphane were "much improved" or "very much improved" on the aberrant or abnormal behavior subdomain of the CGI-I compared with 6.7% (1 of 15) of placebo participants ($P = 0.007$). Thirty-eight percent (11 of 29) participants on sulforaphane were "much improved" or "very much improved" on the verbal communication subdomain of the CGI-I compared with 6.7% (1 of 15) of placebo participants ($P = 0.035$).

In conclusion, the ITT data analysis is presented as the most conservative approach to evaluation of the data, and results in similar findings that confirm the per-protocol analysis. Moreover, whether those participants who dropped out of the study are included or excluded does not detract from the statistical validity of sulforaphane's effects in this clinical trial of young men with autism spectrum disorder.

1. Egner PA, et al. (2014) Rapid and sustainable detoxication of airborne pollutants by broccoli sprout beverage: Results of a randomized clinical trial in China. *Cancer Prev Res (Phila)* 7(8):813–823.

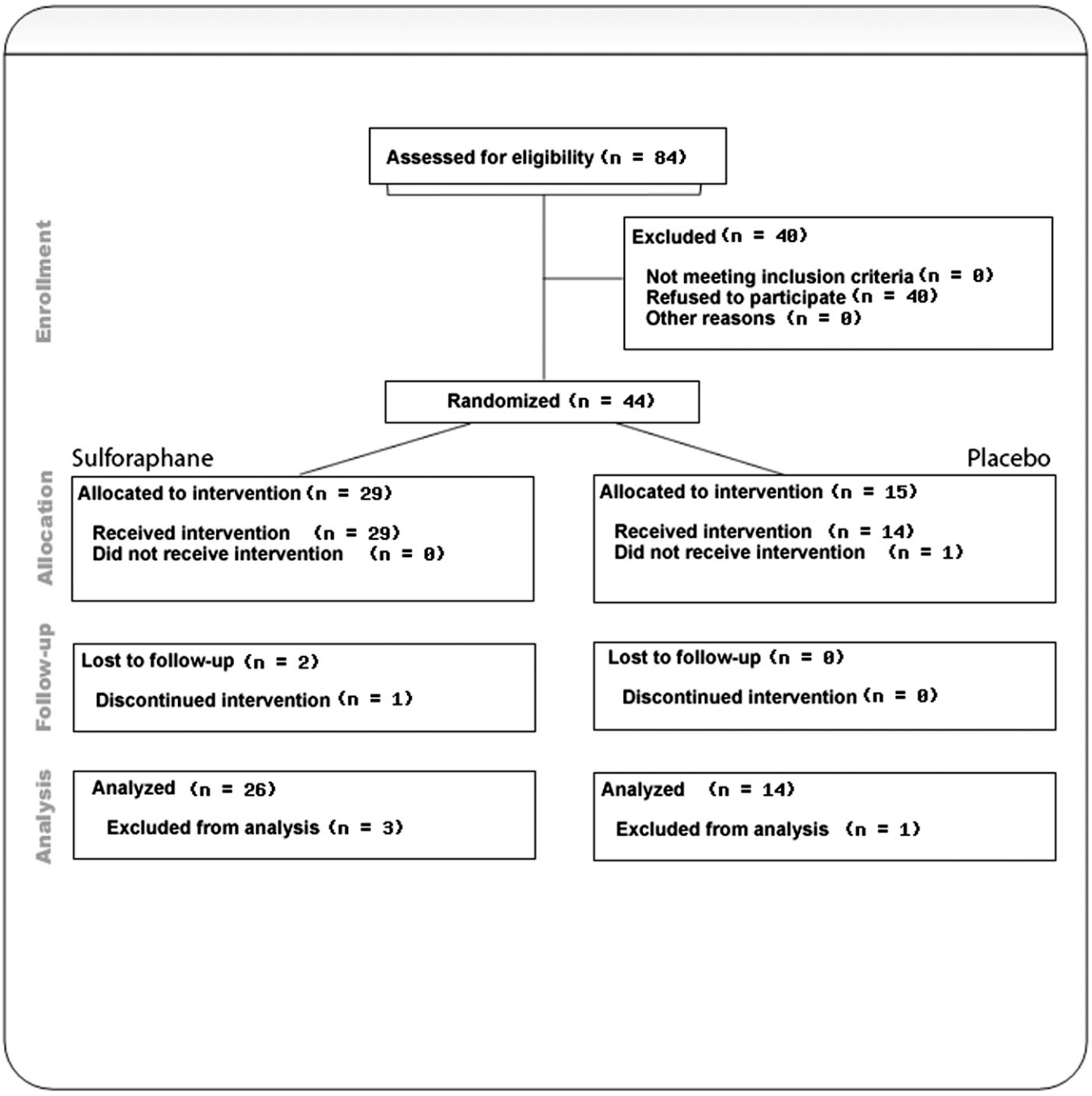


**Fig. S1.** Flow diagram of progress through phases of the study.

**Table S1. Baseline characteristics of patients ($n$ = 44) who volunteered for the study**

| Characteristics | Placebo group ($n$ = 15) | Sulforaphane group ($n$ = 29) | $P$ value* |
|---|---|---|---|
| Age (Mean ± SD) | 16.6 ± 3.5 | 17.9 ± 3.9 | 0.27 |
| Weight (lbs.) | 154.7 ± 39.7 | 170.9 ± 50.4 | 0.28 |
| Body mass index | 23.7 ± 5.1 | 25.9 ± 6.5 | 0.26 |
| Head circumference (cm) | 56.3 ± 2.8 | 58.1 ± 2.4 | 0.06 |
| Pulse rate per minute | 88 ± 15 | 80 ± 14 | 0.07 |
| Temperature (° F) | 98.6 ± 0.6 | 98.4 ± 0.9 | 0.27 |
| Systolic blood pressure (mm Hg) | 117 ± 13 | 119 ± 14 | 0.55 |
| Diastolic blood pressure (mm Hg) | 73 ± 6 | 76 ± 8 | 0.31 |
| Abnormal physical examination findings | | | |
| Skin | 1/15 | 4/29 | 0.65 |
| Head, eye, ear, nose, throat | 1/15 | 1/29 | 1.0 |
| Neck/thyroid | 0/15 | 0/29 | — |
| Chest/lungs | 1/15 | 0/29 | 1 |
| Cardiovascular | 1/15 | 0/29 | 0.33 |
| Abdominal | 0/15 | 0/29 | — |
| Neurological | 1/15 | 2/29 | 1.0 |
| Dysmorphic features | 1/15 | 3/29 | 1.0 |
| Race/ethnicity | | | |
| White | 13/15 | 26/29 | 0.5 |
| Black | 0/15 | 2/29 | |
| Hispanic | 1/15 | 0/29 | |
| Asian | 1/15 | 1/29 | |
| Reported history of fever effects | 11/15 | 23/29 | |
| Autism Diagnostic Observation Schedule score | | | |
| Communication | 6.0 ± 1.9 | 6.6 ± 2.0 | 0.36 |
| Social interaction | 11.6 ± 2.0 | 11.2 ± 1.7 | 0.50 |
| Communication + social interaction | 17.6 ± 3.1 | 17.8 ± 3.1 | 0.86 |
| Stereotyped behavior and restricted interests | 3.6 ± 1.7 | 2.9 ± 1.5 | 0.16 |
| ABC score (screening and baseline averaged) | | | |
| Total raw score | 60.0 ± 23.2 | 63.6 ± 25.3 | 0.65 |
| Irritability subscale | 14.2 ± 8.9 | 13.7 ± 9.3 | 0.89 |
| Lethargy subscale | 13.9 ± 6.3 | 15.1 ± 7.6 | 0.62 |
| Stereotypy subscale | 10.3 ± 5.2 | 10.1 ± 4.5 | 0.93 |
| Hyperactivity subscale | 18.2 ± 8.5 | 19.7 ± 9.3 | 0.59 |
| Inappropriate speech subscale | | | |
| SRS score (screening and baseline averaged) | | | |
| Total raw score | 120.1 ± 16.6 | 122.2 ± 24.1 | 0.77 |
| Awareness subscale | 14.6 ± 2.8 | 15.8 ± 3.8 | 0.30 |
| Cognition subscale | 21.0 ± 3.4 | 23.2 ± 5.5 | 0.16 |
| Communication subscale | 41.5 ± 7.1 | 40.9 ± 8.6 | 0.84 |
| Motivation subscale | 18.4 ± 4.0 | 19.2 ± 4.9 | 0.60 |
| Mannerisms subscale | 25.2 ± 4.8 | 23.3 ± 6.3 | 0.31 |
| Ohio Autism Clinical Global Impression Severity | | | |
| Scale-severity score | | | |
| General level of autism | 4.53 ± 0.74 | 4.38 ± 0.56 | 0.45 |
| Social interaction | 4.80 ± 1.01 | 4.51 ± 0.69 | 0.28 |
| Aberrant/abnormal behavior | 4.20 ± 1.37 | 4.21 ± 0.86 | 0.99 |
| Repetitive/ritualistic behavior | 4.13 ± 0.83 | 4.14 ± 0.74 | 0.99 |
| Verbal communication | 4.53 ± 1.36 | 4.45 ± 0.95 | 0.81 |
| Nonverbal communication | 4.27 ± 0.96 | 4.10 ± 0.72 | 0.53 |
| Hyperactivity and inattention | 4.40 ± 0.91 | 4.10 ± 0.90 | 0.31 |
| Anxiety | 4.33 ± 1.23 | 4.17 ± 0.71 | 0.65 |
| Sensory sensitivities | 4.40 ± 0.74 | 4.07 ± 0.65 | 0.13 |
| Restricted and narrow interests | 4.33 ± 0.72 | 4.41 ± 0.63 | 0.70 |
| Hematology laboratories | | | |
| Hematocrit (ref: 37.5–51.0%) | 43.7 ± 2.3 | 44.2 ± 2.3 | 0.56 |
| Hemoglobin (ref: 12.6–17.7 g/dL) | 14.9 ± 0.8 | 15.2 ± 0.9 | 0.46 |
| Mean corpuscular hemoglobin (ref: 26.6–33.0 pg) | 29.7 ± 1.6 | 29.67 ± 1.5 | 0.89 |
| Mean corpuscular hemoglobin concentration (ref: 31.5–35.7 g/dL) | 34.1 ± 0.7 | 34.6 ± 0.7 | 0.06 |
| Mean corpuscular volume (ref: 79–97 fL) | 86.4 ± 3.2 | 85.6 ± 4.2 | 0.54 |
| Platelet count (ref: 150–349 × $10^3$/μL) | 245.5 ± 47.8 | 251.5 ± 55.5 | 0.74 |
| RBC count (ref: 4.14–5.80 × $10^6$/μL) | 5.1 ± 0.3 | 5.2 ± 0.5 | 0.27 |

**Table S1. Cont.**

| Characteristics | Placebo group ($n$ = 15) | Sulforaphane group ($n$ = 29) | $P$ value* |
|---|---|---|---|
| WBC count (ref: 4.0–9.1 × $10^3$/μL) | 6.9 ± 2.3 | 6.8 ± 1.7 | 0.85 |
| Blood chemistry laboratories | | | |
| Sodium (mEq/L) (ref: 135–145 mmol/L) | 139.4 ± 3.4 | 139.8 ± 2.2 | 0.68 |
| Potassium (ref: 3.4–4.8 mmol/L) | 3.7 ± 0.5 | 3.8 ± 0.3 | 0.72 |
| Chloride (ref: 100–108 mmol/L) | 105 ± 3.1 | 105 ± 2.4 | 0.97 |
| $CO_2$ (ref: 23.0–31.9 mmol/L) | 23.6 ± 2.4 | 22.3 ± 3.2 | 0.17 |
| Anion gap | 10.9 ± 3.5 | 12.5 ± 3.0 | 0.13 |
| Blood urea nitrogen (BUN, ref: 8–25 mg/dL) | 14 ± 5.1 | 12.7 ± 3.1 | 0.41 |
| Serum creatinine (ref: 0.60–1.50 mg/dL) | 0.8 ± 0.1 | 0.8 ± 0.1 | 0.85 |
| Serum glutamic oxaloacetic transaminase (SGOT, ref: 10–40 U/L) | 22.8 ± 6.4 | 22.6 ± 8.6 | 0.92 |
| Serum glutamic pyruvic transaminase (SGPT, ref: 10–55 U/L) | 18.3 ± 6.1 | 30.0 ± 20.6 | 0.009 |
| Alkaline phosphatase (ref: 15–350 U/L) | 180.9 ± 122.1 | 116.4 ± 50.8 | 0.08 |
| Total bilirubin (ref: 0.0–1.0 mg/dL) | 0.6 ± 0.2 | 0.4 ± 0.3 | 0.12 |
| TSH (ref: 0.5–4.0 μIU/mL) | 1.6 ± 0.9 | 2.0 ± 2.1 | 0.35 |
| Abnormal urinalysis results | | | |
| Urine bilirubin | 0/12 | 0/22 | — |
| Urine glucose | 0/12 | 0/22 | — |
| Urine ketones | 0/12 | 1/22 | 1.0 |
| Urine occult blood | 0/12 | 0/22 | — |
| Urine protein | 1/12 | 2/22 | 1.0 |
| Urine pH | 6.7 ± 0.8 | 7.0 ± 0.8 | 0.28 |

*$P$ values are based on two-tailed $t$ tests, Fisher's exact, or $\chi^2$ tests.

**Table S2. Summary of adverse events reported and safety laboratories at 18 wk**

| Clinical indicators | Placebo group ($n$ = 14) | Sulforaphane group ($n$ = 26) | $P$ value* |
|---|---|---|---|
| Weight gain (lbs.) | 0.31 ± 6.16 | 4.31 ± 5.87 | 0.05 |
| Heart rate (beats per minute) | 88 ± 15 | 79 ± 13 | 0.06 |
| Temperature (° F) | 98.6 ± 0.87 | 98.3 ± 0.81 | 0.28 |
| Vomiting | 1 (7.1%) | 5 (19.2%) | 0.40 |
| Aggressions | 2 (14.3%) | 4 (15.4%) | 1.00 |
| Abdominal pain | 2 (14.3%) | 4 (15.4%) | 1.00 |
| Flatulence | 2 (14.3%) | 4 (15.4%) | 1.00 |
| Irritability | 0 (0%) | 3 (11.5%) | 0.54 |
| Constipation | 2 (14.3%) | 3 (11.5%) | 1.00 |
| Diarrhea | 1 (7.1%) | 3 (11.5%) | 1.00 |
| Fever | 1 (7.1%) | 3 (11.5%) | 1.00 |
| Headache | 0 (0%) | 3 (11.5%) | 0.53 |
| Allergy exacerbation | 0 (0%) | 3 (11.5%) | 0.54 |
| Unprovoked seizures | 0 (0%) | 2 (7.7%) | 0.53 |
| Stubbornness | 0 (0%) | 2 (7.7%) | 0.53 |
| Insomnia | 4 (28.6%) | 2 (7.7%) | 0.16 |
| Cough | 0 (0%) | 2 (7.7%) | 0.53 |
| Agitation | 1 (7.1%) | 1 (3.8%) | 1.00 |
| Crying spells | 1 (7.1%) | 1 (3.8%) | 1.00 |
| Hyperactivity | 2 (14.3%) | 1 (3.8%) | 0.28 |
| Obsessive compulsive disorder | 0 (0%) | 1 (3.8%) | 1.00 |
| Impatience | 0 (0%) | 1 (3.8%) | 1.00 |
| Fidgety | 0 (0%) | 1 (3.8%) | 1.00 |
| Disinhibition | 0 (0%) | 1 (3.8%) | 1.00 |
| Self-injurious behavior | 0 (0%) | 1 (3.8%) | 1.00 |
| Pica | 0 (0%) | 1 (3.8%) | 1.00 |
| Increased appetite | 1 (7.1%) | 1 (3.8%) | 1.00 |
| Mouth sores | 0 (0%) | 1 (3.8%) | 1.00 |
| Daytime sleepiness | 0 (0%) | 1 (3.8%) | 1.00 |
| Sore throat | 0 (0%) | 1 (3.8%) | 1.00 |
| Asthma exacerbation | 0 (0%) | 1 (3.8%) | 1.00 |
| Anxiety | 2 (14.3%) | 0 (0%) | 0.12 |
| Lethargy | 2 (14.3%) | 0 (0%) | 0.12 |
| Burping | 3 (21.4%) | 0 (0%) | **0.03** |
| Decreased appetite | 1 (7.1%) | 0 (0%) | 0.35 |
| Increased urination | 1 (7.1%) | 0 (0%) | 0.35 |
| Hematology labs at 18 wk | | | |
| Hematocrit (ref: 37.5–51.0%) | 43.4 ± 3.5 | 43.4 ± 2.5 | 0.99 |
| Hemoglobin (ref: 12.6–17.7 g/dL) | 14.7 ± 1.3 | 14.9 ± 1.0 | 0.51 |
| Mean corpuscular hemoglobin (ref: 26.6–33.0 pg) | 29.4 ± 1.2 | 29.7 ± 1.6 | 0.59 |
| Mean corpuscular hemogobin concentration (ref: 31.5–35.7 g/dL) | 33.9 ± 0.6 | 34.4 ± 0.8 | 0.09 |
| Mean corpuscular volume (ref: 79–97 fL) | 86.6 ± 3.4 | 86.0 ± 3.8 | 0.60 |
| Platelet count (ref: 150–349 × $10^3$/μL) | 236.8 ± 44.8 | 237.1 ± 45.2 | 0.98 |
| RBC count (ref: 4.14–5.80 × $10^6$/μL) | 5.0 ± 0.4 | 5.1 ± 0.4 | 0.53 |
| WBC count (ref: 4.0–9.1 × $10^3$/μL) | 6.3 ± 1.7 | 5.9 ± 1.6 | 0.50 |
| Abnormal Hematology laboratories (outside of reference range) | | | |
| Hematocrit | 0/13 | 0/25 | |
| Hemoglobin | 0/13 | 0/25 | |
| Mean corpuscular hemoglobin | 0/13 | 1/25 | 1.00 |
| Mean corpuscular hemoglobin concentration | 0/13 | 1/25 | 1.00 |
| Mean corpuscular volume | 0/13 | 1/25 | 1.00 |
| Platelet count | 1/13 | 1/25 | 0.57 |
| RBC count | 0/13 | 1/25 | 1.00 |
| WBC count | 1/13 | 2/25 | 1.00 |
| Blood chemistry labs at 18 wk | | | |
| Sodium (ref: 135–145 mmol/L) | 139.8 ± 1.7 | 139.7 ± 1.9 | 0.83 |
| Potassium (ref: 3.4–4.8 mmol/L) | 3.6 ± 0.4 | 3.8 ± 0.3 | 0.30 |
| Chloride (ref: 100–108 mmol/L) | 103.9 ± 2.5 | 103.5 ± 2.3 | 0.64 |
| $CO_2$ (ref: 23.0–31.9 mmol/L) | 23.6 ± 2.0 | 24.2 ± 2.6 | 0.51 |
| Anion gap | 12.3 ± 2.9 | 12.0 ± 2.2 | 0.48 |
| BUN (ref: 8–25 mg/dL) | 12.3 ± 2.8 | 13.0 ± 3.4 | 0.57 |

**Table S2. Cont.**

| Clinical indicators | Placebo group ($n$ = 14) | Sulforaphane group ($n$ = 26) | $P$ value* |
|---|---|---|---|
| Serum creatinine (ref: 0.60–1.50 mg/dL) | 0.8 ± 0.1 | 0.8 ± 0.1 | 0.34 |
| SGOT (ref: 10–40 U/L) | 22.5 ± 9.2 | 22.5 ± 5.4 | 0.98 |
| SGPT (ref: 10–55 U/L) | 22.2 ± 20.1 | 31.1 ± 20.7 | 0.22 |
| Alkaline phosphatase (ref: 15–350 U/L) | 136.9 ± 52.5 | 112.5 ± 53.2 | 0.19 |
| Total bilirubin (ref: 0.0–1.0 mg/dL) | 0.6 ± 0.3 | 0.5 ± 0.3 | 0.54 |
| TSH (ref: 0.5–4.0 μIU/mL) | 1.5 ± 0.6 | 1.9 ± 1.1 | 0.19 |
| Abnormal blood chemistry laboratories (outside of reference range) | | | |
| SGPT | 1/13 | 4/24 | 0.64 |
| $CO_2$ | 5/13 | 6/24 | 0.46 |
| Sodium | 0/13 | 1/24 | 1.00 |
| Potassium | 2/13 | 1/24 | 0.28 |
| Chloride | 1/13 | 1/24 | 1.00 |
| BUN | 1/13 | 1/24 | 1.00 |
| Serum creatinine | 0/13 | 0/24 | — |
| SGOT | 1/13 | 0/24 | 0.35 |
| Alkaline phosphatase | 0/13 | 0/24 | — |
| Total bilirubin | 1/13 | 2/24 | 1.00 |
| TSH | 1/13 | 1/24 | 1.00 |
| Urinalysis at 18 wk | | | — |
| Urine bilirubin | 0/13 | 0/24 | — |
| Urine glucose | 0/13 | 1/24 | 1.00 |
| Urine ketones | 0/13 | 1/24 | 1.00 |
| Urine occult blood | 0/13 | 0/24 | — |
| Urine protein | 1/13 | 0/24 | 0.35 |
| Urine pH (ref: 5.0–7.5) | 6.8 ± 0.5 | 7.2 ± 0.8 | 0.03 |
| Urine pH outside of reference range | 1/13 | 7/24 | 0.22 |

*$P$ values are based on two-tailed $t$ tests, Fisher's exact, or $\chi^2$ tests.

**Dataset S1. Complete safety laboratory studies (hematology, chemistry, urinalysis)**

Dataset S1