Nutritional Biomarkers and Disease Association Studies in the Women’s Health Initiative

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WHI Annual Investigator Meeting
Chicago, IL
May 3, 2018
WHI Biomarker Studies:  
NBS (n=544) NPAAS (n=450) and NPAAS–FS* (n=153)

- Invitation letter and telephone screening interview
  - Not eligible

- Eligible & willing
  - Schedule clinic visits
    - WHI clinical centers
  - Informed consent
  - Anthropometry
  - Pre-DLW spot urine
  - DLW dosing
  - 3 post-DLW spot urines
  - Complete FFQ, activity, and other questionnaires
  - 24-hr urine collection instructions
  - Visit 1
  - Collect 24-hr urine

- Bring 24-hr urine, food record
- Weight
- Fasting blood draw
- 2 spot urines
- Indirect calorimetry
  - Visit 2
  - Subset, n=110
  - 20% repeat all procedures 6 mo later (reliability study) plus 2-3 24-hr recalls

* Included 2 week feeding study, which did not include reliability study
Continued Nutritional Biomarker Development

- A useful nutritional biomarker should have good correlation with the nutrient (or ‘food substance’). We are using a benchmark correlation of 0.7 since this approximates the correlation for doubly labeled water (benchmark).

- From recent NPAAS feeding study:
  - Vitamin $B_{12}$, alpha carotene >0.70
  - Folate, beta-carotene, lutein+zeaxanthin, alpha-tocopherol 0.6 - 0.7

- These are being used to develop calibration equations to calibrate diet quality indices (HEI, a-HEI, aMED, DASH) for use in disease analyses

- We are also developing new nutritional biomarkers: metabolomics
NPAAS the future: involving YOU!

- Can we expand our reach and propose R01s with specific disease endpoints based on novel biomarkers for nutrients and foods using stored specimens and the adjudicated outcomes in WHI?

- Yes, novel serum-based biomarkers from NPAAS-FS can be directly applied to stored serum in a case-control mode for various outcomes: cancer, CVD, Diabetes, Obesity, Aging (healthy aging or frailty), cognitive function and others…..

- These applications, with objective biomarker intake assessments, do not require use of dietary self-report data (e.g. submitted 2018 paper on carotenoids and tocopherols and various chronic diseases using 5.8% sub-cohort)