The COcoa Supplement and Multivitamin Outcomes Study (COSMOS)

JoAnn E. Manson, MD, DrPH
Howard D. Sesso, ScD, MPH
Brigham and Women's Hospital
Harvard Medical School

Garnet L. Anderson, PhD
Fred Hutchinson Cancer Research Center

WHI Investigators Meeting
May 3, 2018
COocoa Supplement and Multivitamin Outcomes Study (COSMOS)

N=21,445
12,680 women aged ≥65 y, 8,765 men aged ≥60 y free of CVD and recently diagnosed cancer

Cocoa flavanols (600 mg/d)  
N=10,722

Placebo  
N=10,723

Multivitamin  
N=5,361

Placebo  
N=5,361

Multivitamin  
N=5,362

Placebo  
N=5,361

Median Treatment Period = 4.0 years
Primary Outcomes: Major cardiovascular events (MI, stroke, CVD death, and coronary revascularization) and total cancer (excluding non-melanoma skin cancer)
Baseline Blood/Urine Collection: >6800 participants; follow-up samples in a subgroup
Baseline Clinic Visit: Subcohort of ~600 Boston-based participants with follow-up at 2 years
COSMOS Blood (Biospecimen Collection)

- **Timeline and sample size of blood and urine collections**

<table>
<thead>
<tr>
<th>Time</th>
<th>Actual to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (April 2016-March 2018)</td>
<td>~7,000</td>
</tr>
<tr>
<td>Year 1 (began August 2017)</td>
<td>1,200</td>
</tr>
<tr>
<td>Year 2</td>
<td>1000 (planned), mid-late 2018</td>
</tr>
<tr>
<td>Year 4</td>
<td>1000 (planned), mid-late 2020</td>
</tr>
</tbody>
</table>

- **Home visit via Examination Management Services Inc (EMSI)**
  - Fasting blood and spot urine collection
  - Seated BP, height, weight, waist and hip circumference
- Participants can also collect blood and urine on their own or by visiting a Quest Diagnostics center around the U.S.
COSMOS Clinic Visits

- **Timeline and sample size of clinic visits at BWH, Boston:**
  - Baseline and 2-year follow-up in ~600 women and men
- **In-depth assessments at clinical visits:**
  - Fasting blood, spot urine, anthropometry
  - Cognitive (including ModBent) and physical function
  - Vascular studies, 24-hour ABP, fecal samples, and MRI

<table>
<thead>
<tr>
<th>Time</th>
<th>Completed to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (Sept 2016 - March 2018)</td>
<td>603 (297 women, 306 men)</td>
</tr>
<tr>
<td>Vascular: Pulse Wave Velocity</td>
<td>~550</td>
</tr>
<tr>
<td>24-hour Ambulatory BP</td>
<td>~500</td>
</tr>
<tr>
<td>Fecal samples</td>
<td>~400</td>
</tr>
<tr>
<td>Brain MRI</td>
<td>105</td>
</tr>
<tr>
<td>Year 2 (same studies)</td>
<td>To begin in mid 2018</td>
</tr>
</tbody>
</table>
COSMOS Mind

• Supported through an NIH (NIA) grant.
• Led by Wake Forest University (Laura Baker, PI).
• **Telephone-based cognitive assessments:**
  • No dementia at baseline
  • ~45 minutes long
  • Telephone interview for cognitive status-modified (TICSm) and other tests

<table>
<thead>
<tr>
<th>Time</th>
<th>Completed to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (began July 2016)</td>
<td>2,249</td>
</tr>
<tr>
<td>Year 1 (began September 2017)</td>
<td>Ongoing (n~2000)</td>
</tr>
<tr>
<td>Year 2</td>
<td>To begin in mid 2018</td>
</tr>
<tr>
<td>Year 3</td>
<td>To begin in mid 2019</td>
</tr>
</tbody>
</table>
COSMOS Web (ModBent)

- Supported through Mars Symbioscience.
- In collaboration with Columbia University.
- **Web-based cognitive assessments:**
  - ~30 minutes long
  - Conducted at baseline, 1, 2, and 3 years
  - ModBent (novel pattern recognition task)
  - Flanker and Spatial Memory Tests

<table>
<thead>
<tr>
<th>Time</th>
<th>Completed to Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (began July 2016)</td>
<td>3,958</td>
</tr>
<tr>
<td>Year 1 (began October 2017)</td>
<td>Ongoing (n~3000)</td>
</tr>
<tr>
<td>Year 2</td>
<td>To begin in mid 2018</td>
</tr>
<tr>
<td>Year 3</td>
<td>To begin in mid 2019</td>
</tr>
</tbody>
</table>
COSMOS Eye

• Supported through an NIH (NEI) grant.

• Led by Dr. Bill Christen at BWH.

• Addition of cataract and age-related macular degeneration (AMD) as confirmed endpoints in COSMOS.
Conclusions

• COSMOS provides exciting opportunities for biomarker, microbiome, ambulatory BP, vascular, cognitive, and vision studies.

• We encourage manuscript proposals and ancillary study applications leveraging this resource.

Thank you!