Research Dietetic Practice Group
Presents:
The Future of Dietetic and Nutrition Research
October 30, 2018

First Speaker: Linda Snetselaar, PhD, RD, LD, FAND
Associate Provost for Outreach and Engagement
Endowed Chair
Professor in Epidemiology
College of Public Health
University of Iowa

Second Speaker: Jessica A. Alvarez, PhD, RD
Assistant Professor of Medicine
Emory University School of Medicine

Moderator: Maria Azrad, PhD, RD
RDPG Webinar Chair
Assistant Professor
College of Human Environmental Science
University of Alabama
A Journey Through the Field of Nutrition and Dietetics

Linda Snetselaar, PhD, RD, LD, FAND
Associate Provost for Outreach and Engagement
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Professor in Epidemiology
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Food, Culture and Communities
Food

- Culture
- Families
- Communities
Where We Have Been: A Food and Nutrition Journey
Progression of Food and Nutrition Research

› Nutrients and specific disease-prone populations
› Food groups in populations
› Dietary patterns in families and community groups with tailored messages about food and health
Microbiomes: Bacteria in the Gastrointestinal Track
Diabetes Control and Complications Trial (DCCT)

- Focused on persons with diabetes
- Designed to compare standard treatments to one that focuses on food and insulin
- Included a team of dietitians, doctors, nurses, and psychologists
DCCT Impact

› Fewer diabetes complications in the food and insulin group
› Ended one year early
› Changed the practice of medicine using food and insulin to treat diabetes

(NEJM, 1993; 14: 977-986)
Intensive Therapy Reduced

- Microalbuminuria
  35%
- Clinical grade albuminuria
  56%
- Clinical neuropathy
  60%
DCCT Intensive Therapy

• Achieved mean HbA$_{1c}$ substantially lower than conventional therapy, albeit not in non-diabetic range

• Associated with a three-fold increase in severe hypoglycemia
Food and Families

› Eating together
› Involving children in all aspects
› Modeling
Dietary Intervention Study in Children

- Focused on children ages 8-10 with high blood cholesterol levels
- Included a group with a low-fat diet and a group with a usual American diet higher in fat
- Emphasized a reduction in levels of blood cholesterol and safety by focusing on height and weight and iron levels
Program

• Individual and Group Sessions
  ▪ Shopping Safari
  ▪ DISC Scavenger Hunt
  ▪ Dairy Dunk Game
  ▪ Build a vegetable and fruit person
Impact

- Significant changes in dietary saturated fat intake
- Differences in blood cholesterol
- No differences in safety measures including growth between the two groups

*(JAMA. 1995; 273: 1429-1435)*
## Results:
### Serum Ferritin (µg/L)

<table>
<thead>
<tr>
<th></th>
<th>Usual Care</th>
<th>Intervention</th>
<th>Adjusted Differences*</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean ± SD</td>
<td>Mean ± SD</td>
<td>Mean</td>
<td>95% CI</td>
</tr>
<tr>
<td>Baseline</td>
<td>38.7 ± 21.1</td>
<td>36.3 ± 19.2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Year 1</td>
<td>37.4 ± 18.8</td>
<td>34.8 ± 21.5</td>
<td>-0.9</td>
<td>-3.5,-1.7</td>
</tr>
<tr>
<td>Year 3</td>
<td>33.6 ± 22.9</td>
<td>29.6 ± 18.0</td>
<td>-2.1</td>
<td>-4.9,-0.8</td>
</tr>
</tbody>
</table>

* Adjusted for baseline and gender
## Results: Height (cm)

<table>
<thead>
<tr>
<th>Year</th>
<th>Usual Care Mean ± SD</th>
<th>Intervention Mean ± SD</th>
<th>Adjusted Differences* Mean ± SD</th>
<th>95% CI</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline</td>
<td>136.5 ± 7.0</td>
<td>136.2 ± 6.8</td>
<td></td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>Year 1</td>
<td>143.1 ± 7.4</td>
<td>143.1 ± 6.9</td>
<td>0.4</td>
<td>0.02,0.7</td>
<td>NS</td>
</tr>
<tr>
<td>Year 3</td>
<td>156.1 ± 8.6</td>
<td>156.2 ± 8.1</td>
<td>0.6</td>
<td>-0.02,1.2</td>
<td>NS</td>
</tr>
</tbody>
</table>

* Adjusted for baseline and gender
BMi² Brief Motivational Interviewing (MI) to Reduce Child BMI

› Focused on parents of children between the ages of 2-8 who were overweight

› Trained pediatricians and dietitians to more effectively communicate with parents
Ways to Talk with Children

Past Advice to Parents
• Eat 6 ounces of grains everyday.

Inviting Consideration of Change
• Start smart with breakfast. Consider eating whole-grain cereals.

• Eat 2 ½ cups of vegetables everyday.

• Consider coloring your plate with all kinds of great-tasting veggies.
The MI Message to Parents: “You provide; they decide.”

Phrases that HINDER
• Eat that for me.

• You’re such a big girl; you finished all your peas.

• See, that didn’t taste so bad, did it?

• No dessert until you eat your vegetables.

Phrases that HELP
• This is kiwi fruit; it’s sweet like a strawberry.

• Is your stomach telling you you’re full?

• Everybody likes different foods, don’t they?

• We can try those vegetables again another time.
BMi² Brief Motivational Interviewing (MI) to Reduce Child BMI: Impact

› After 2 years, pediatrician and dietitian teams most successful in getting children to healthier weight
› Fruits and vegetables eaten by the child in this group increased
› TV viewing time decreased

(Pediatrics, 2015 accepted)
Supporting Communities in Healthful Lifestyle Change: Community-Based Participatory Research
Research To Inform Nutrition Programs for Chuukese in Chuuk and Hawaii
Mid 1900’s

Marshall Islands 1944

Source: MicSem
Most Rev. Bishop Thomas A. Camacho addresses the health issue of food servings during rosaries held at the church social halls.
Spiritual/Religious Orientation

› Church is the center of all activities
› Church is a great place to engage a community
› Pastors = Community Leaders

(JAND. 2015, accepted)
A Journey Through the Field of Nutrition and Dietetics

Linda Snetselaar, PhD, RD, LD, FAND
Associate Provost for Outreach and Engagement
Endowed Chair
Professor in Epidemiology
College of Public Health
University of Iowa
The Future of Nutrition Research: A Junior Faculty Perspective

Jessica A. Alvarez, PhD, RD
Assistant Professor of Medicine
Emory University School of Medicine
Atlanta, GA

Research DPG webinar
10/30/18

No COI
“Training is everything. The peach was once a bitter almond; cauliflower is nothing but cabbage with a college education.” – Mark Twain
Personalized Training Trajectory

**Masters:**
- Traineeship at General Clinical Research Center
- Traineeship at Pediatric Pulmonary Center

**PhD:**

**Postdoc:**
- NIDDK T32 Minority Supplement: High-dose vitamin D in clinical populations

**Junior Faculty:**
- NIDDK K01: “Integration of Nutritional Metabolomics with Bioenergetics in Cystic Fibrosis”
- NIDDK R03: “High-Resolution Plasma Metabolomics for Nutrition-related Assessment in Adults with Cystic Fibrosis”
Future of Nutrition Research

- “Big Data”
- “Omics”
- How do diet & nutrition influence these?
- Precision Nutrition

Figure adapted from: Sun & Hu. Advances in Genetics. 2016;93:147-190.
Metabolomics is Useful to Explore Nutrition-Related Pathophysiology

Profiling small molecules in biologic systems

- Core Nutritional Metabolome
- Non-Nutritive Chemicals in Diet
- Microbiome
- Supplements and Pharmaceuticals
- Commercial Products
- Environmental Chemicals

Food metabolome: ~40 essential nutrients + >2000 intermediates from nutrient metabolism + plant metabolome (>200,000 chemicals)

Largely uncharacterized (maybe 10-40% of plasma metabolome)

Metabolomics Provides Global View of Complex Interactions between Diet and Disease

Glycan metabolism
Lipid metabolism
Carbohydrate metabolism
Amino acid metabolism
Nucleotide metabolism
Cofactor metabolism
Xenobiotic metabolism
Terpenoid metabolism
Energy metabolism
Other secondary metabolism
Other amino acid metabolism

Utility of ‘Omics in Nutrition Research

- Gain pathophysiologic insight into complex diseases
- Link metabolites and metabolic pathways with clinical outcomes to inform targeted nutrition interventions
- Explore metabolic responses to nutrition interventions
- Hypothesis generation for targeted studies
- Identify potential biomarkers for disease onset, progression and resolution
- Validate dietary intake
- Link with other ‘omics’ (proteomics, genomics, microbiomics)
- Optimize nutritional therapy in individuals---Precision Medicine
Role of the RD in ‘Omics Research

- Understanding and interpretation of the role of diet in human metabolism
- Design of safe and feasible dietary interventions resulting from “big data” studies
- Translating complex study findings to patients/clients
“Think Big”

- Get out of your comfort zone.
- Be open to new ideas.
- Think outside of the box.
- Collaborate with other experts in the field.
Funding Opportunities for Early Career Training

- **National Institutes of Health**
  - Ruth L. Kirschstein National Research Service Award (NRSA) program for predoctoral (F31) and postdoctoral fellows (F32)
  - NRSA Institutional training grants (T32)
  - Research Supplements to large NIH grants

- **Foundations**: American Heart Association, American Diabetes Association, American Cancer Society, Academy of Nutrition and Dietetics

- **Institutional pilot funding**
Adventures in Grant Writing for Early Career

- Start early!
- Take advantage of classes.
- Specific Aims page will guide the rest of the grant.
- Candidate section: Tell a story
  - How have your prior experiences led you what you plan to do?
  - Should have a linear trajectory.
- Pick a strong mentoring team.
- Remind reviewers on every page that this is a training/career development grant.
Writing Inspirations from The Master of Horror

- “The scariest moment is always just before you start.”

- “Kill your darlings, kill your darlings, even when it breaks your egocentric little scribbler’s heart, kill your darlings.”

- “If you want to be a writer, you must do two things above all others: read a lot and write a lot.”

- “You learn best by reading a lot and writing a lot, and the most valuable lessons of all are the ones you teach yourself.”

Stephen King, On Writing: A Memoir of the Craft
Please send questions for Drs. Snetselaar and Alvarez to: rdpgwebinars@gmail.com

All questions and answers will be posted on the RDPG website: www.researchdpg.org

Approved for 1 CEU.