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Webinar staff to everyone
Q: Hello! I'm from Oshkosh, Wisconsin
A: Glad you could join us! 1:54 PM

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Q: Good afternoon! I'm joining from Murfreesboro, TN.
A: Good to see you here. 1:54 PM


Webinar staff to everyone
Q: Hello! Doug here, Redding California.
A: Good to see you here Doug! 1:54 PM

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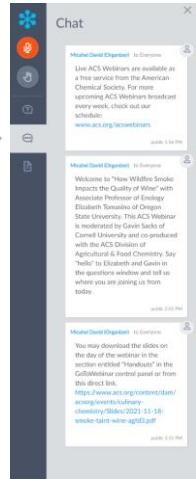


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julia 1:54 PM

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You may download the slides on the day of the webinar in the archive window "Downloads" in the GoWebinar control panel or from this direct link: <https://www.acs.org/content/dam/acsorg/pressroom/chemistry/2023/11-18-smoke-laird-wine-agg102.pdf>
julia 1:54 PM


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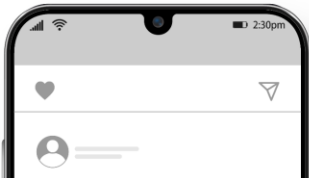


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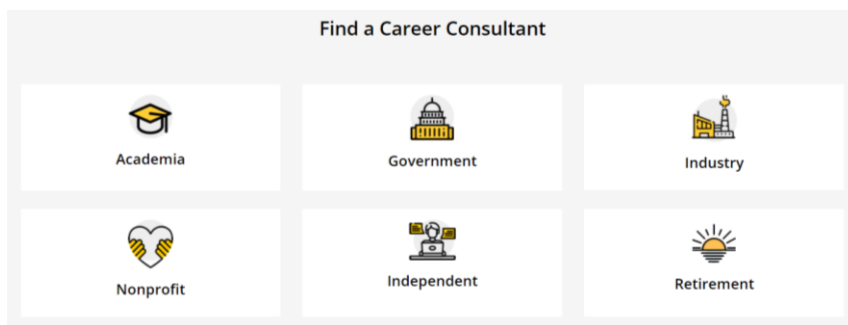
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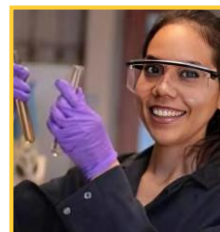


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**Adapted from definitions from the Ford Foundation Center for Social Justice:

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Bonus Episode



By: Gina Viale and Kent Jansen

Carolyn Bertozzi and K. Barry Sharpless chat about sharing the 2022 Nobel Prize in Chemistry
December 6, 2022


Bonus Episode



By: Ariana Merritt and Gina Viale

Bioorthogonal, click chemistry clinch the Nobel Prize
October 9, 2022

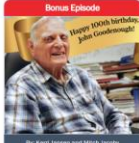
Episode #40



By: Matt Blum and Kent Jansen

Lithium mining's water use sparks bitter conflicts and novel chemistry
September 13, 2022


Bonus Episode



By: Kent Jansen and Misha Jaseby

Happy 100th birthday, John Goodenough! Stereo Chemistry revisits a fan-favorite interview with the renowned scientist
July 25, 2022


Bonus Episode



By: Kent Jansen

Jess Wade on Wikipedia and work-life balance
June 21, 2022


Bonus Episode



By: Kent Jansen

The sticky science of why we eat so much sugar
May 31, 2022


Bonus Episode



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There's more to James Harris's story
April 27, 2022






Bonus Episode



By: Craig Bonbrunson, Kent Jansen

The helium shortage that wasn't supposed to be
March 24, 2022

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Jim Tung

Marketing
Lacamas Laboratories

B.S., Biochemistry, University of Oregon
Ph.D., Organic Chemistry, University of Notre Dame

Jim Tung works at Lacamas Laboratories in Portland, OR, currently as a business development manager. He has been with Lacamas for 10 years, working on developing new chemical manufacturing projects. Before that, he was a senior research chemist at Oblet Research in Champaign, IL, performing kilo-scale organic chemistry.

An Oregon native, Jim got his B.S. in biochemistry from the University of Oregon, his Ph.D. in organic chemistry from the University of Notre Dame, with postdoctoral experience at Pfizer's laboratories in La Jolla, CA. He is past chair of the Portland Section of the American Chemical Society and was 2019 general co-chair of NORM 2019. He has interests in process chemistry, labor economics, social media outreach and encouraging career exploration and development for younger chemists.

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Help! What Industrial Hygienists Can Do For Chemists

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Wednesday, July 12, 2023 | 2-3pm ET

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ERGO: A Potential Answer in Mushrooms to Healthy Aging?



ROBERT BEELMAN, PhD

Professor Emeritus of Food Science and
Director, Center for Plant and Mushroom
Foods for Health, Penn State University



BRIAN GUTHRIE, PhD

Corporate Research Fellow,
Cargill

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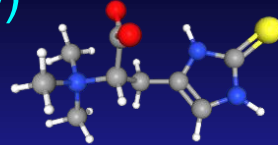
Is Ergothioneine Made by Fungi a Key to Healthy Aging ?



Robert Beelman
Emeritus Professor of Food Science
Penn State University

1

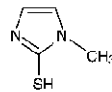
L-ergothioneine (ERGO)



- Discovered in 1909 in Ergot fungus
- Amino acid (m.w. 229)
- Colorless, odorless, water soluble
- Very stable antioxidant



2-mercaptoimidazole



1-methyl-2-mercaptoimidazole
(melhimazole)

2

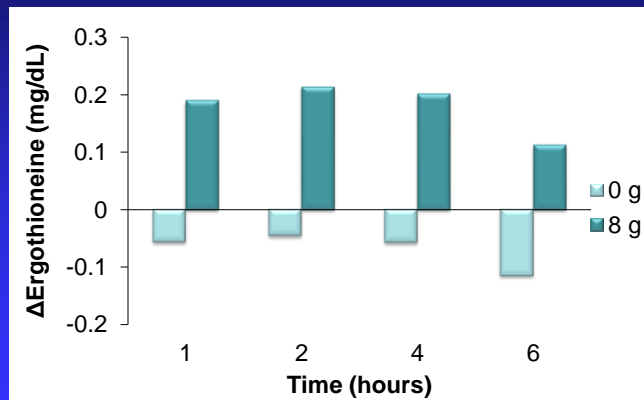
L-ergothioneine (ERGO)

- In 1950's ERGO found in high concentrations in animal and then human blood
 - Traced to feed and food
- Not produced by animals or plants
 - Must be obtained from the diet
- Only produced by fungi, cyanobacteria and some bacteria
- Concentrated in mushrooms
- Discovery of Ergothioneine transporter (ETT)
 - Gründemann, et al. *Proc Natl Acad Sci.* (2005) 102, 5256–5261.
- ETT is highly expressed in tissues that pull ERGO from food and distribute to areas of oxidative stress

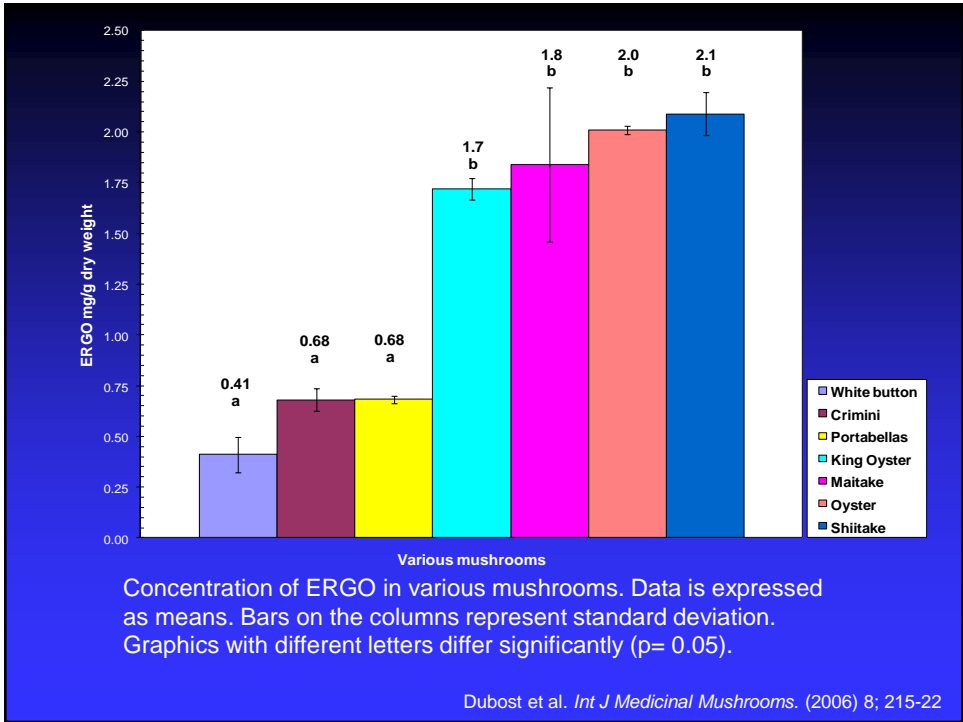
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Uptake of ERGO from the diet

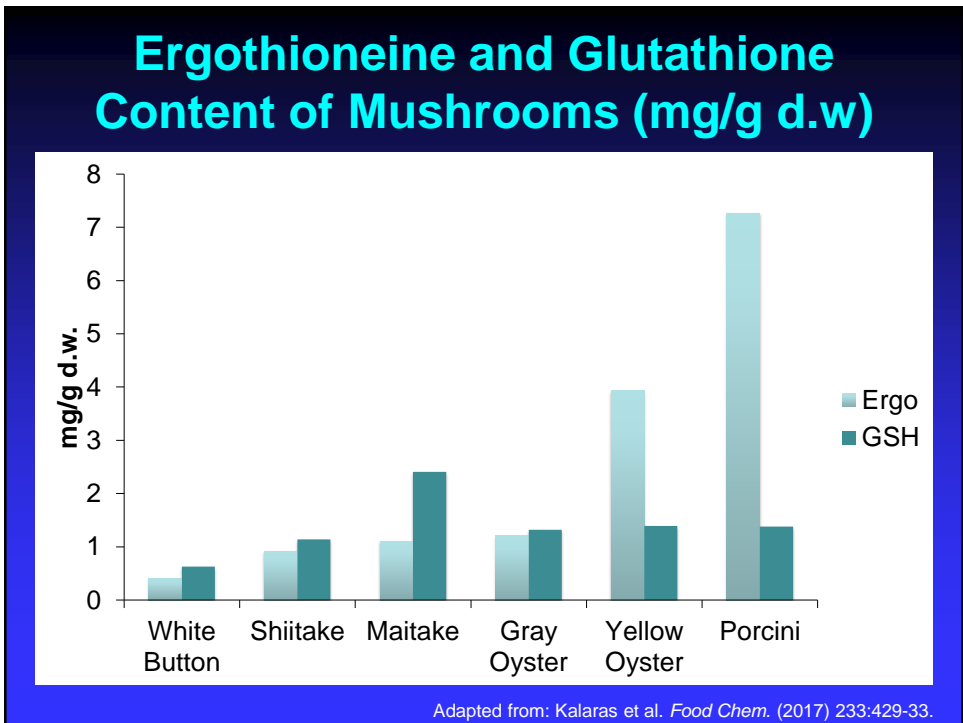
- Highly bioavailable from mushrooms
 - Weigand-Heller, et al. *Prev Med.* (2012) 54, S75–S78.



4

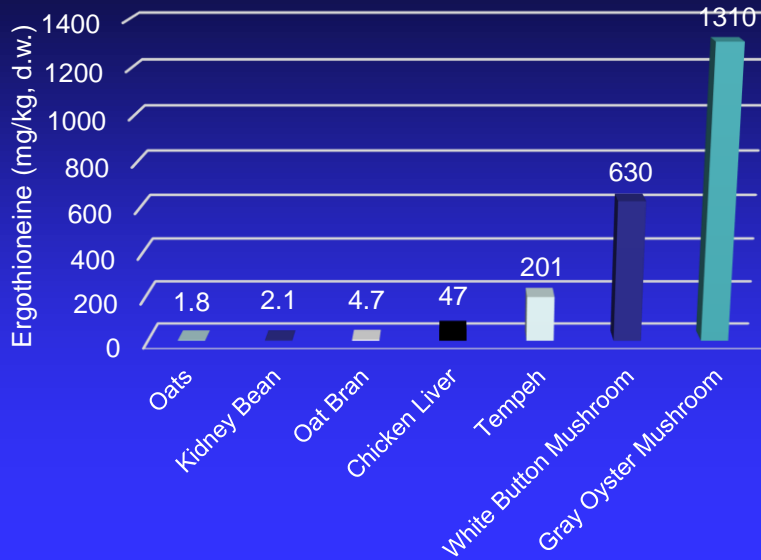


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6

ERGO in the Diet



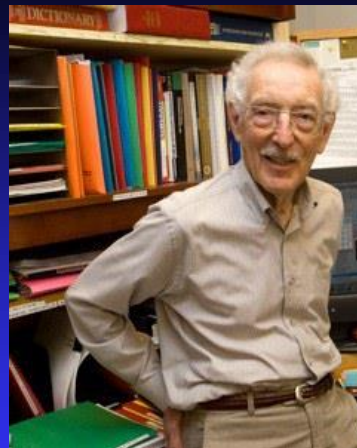
Beelman et al. *J Nutr Sci.* (2020) 9:e52:1–5.

7

Ergo is “a very effective antioxidant. The body clearly wants it, and it doesn’t make it itself. I think it’s pretty clear that it is some kind of “vitamin” that affects aging.”

Triage Theory
(Longevity Vitamin)

Dr. Bruce N. Ames



Prolonging healthy aging: Longevity vitamins and proteins

Bruce N. Ames^{2,1}

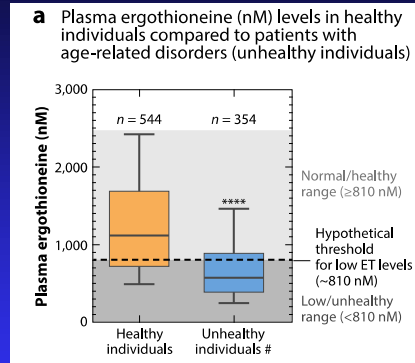
Edited by Cynthia Kenyon, Calico Labs, San Francisco, CA, and approved September 13, 2018 (received for review May 30, 2018)

8

Dr. Barry Halliwell
 Centennial Professor
 National University of Singapore

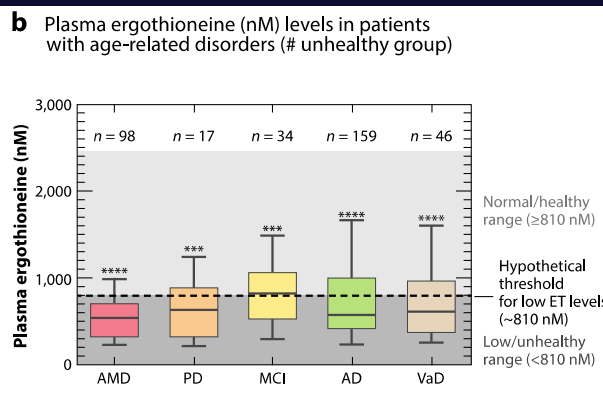


World authority on free radicals,
 antioxidants and aging



Halliwell et al. *Annu Rev Food Sci Technol.* (2023) 14:19.1–19.23

9



(AMD) Age-related macular degeneration; (PD) Parkinson's disease;
 (MCI) Mild cognitive impairment; (AD) Alzheimer's disease;
 (VaD) Vascular dementia

Halliwell et al. *Annu Rev Food Sci Technol.* (2023) 14:19.1–19.23

10

Ergothioneine is associated with reduced mortality and decreased risk of cardiovascular disease


Einar Smith , Filip Ottosson, Sophie Hellstrand, Ulrika Ericson, Marju Orho-Melander, Céline Fernandez, Olle Melander

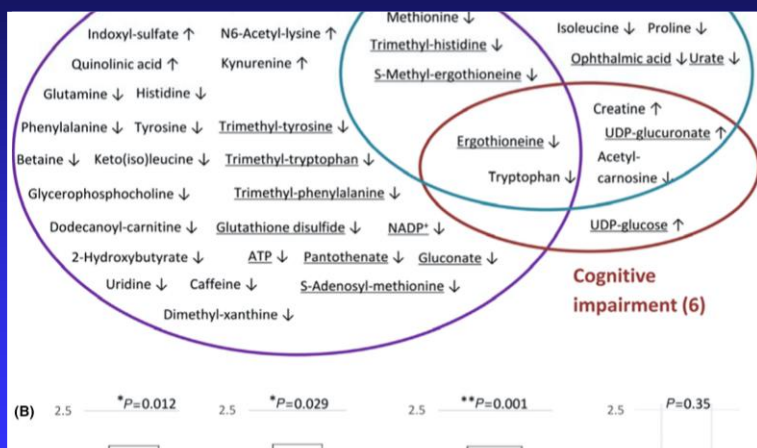
- 112 plasma metabolites were measured in 3236 participants without cardiovascular disease (cVD) and diabetes mellitus
- Identified that higher ergothioneine was an independent marker of lower risk of cardiometabolic disease and mortality

Smith et al. *Heart* (2020) 106:691-7.

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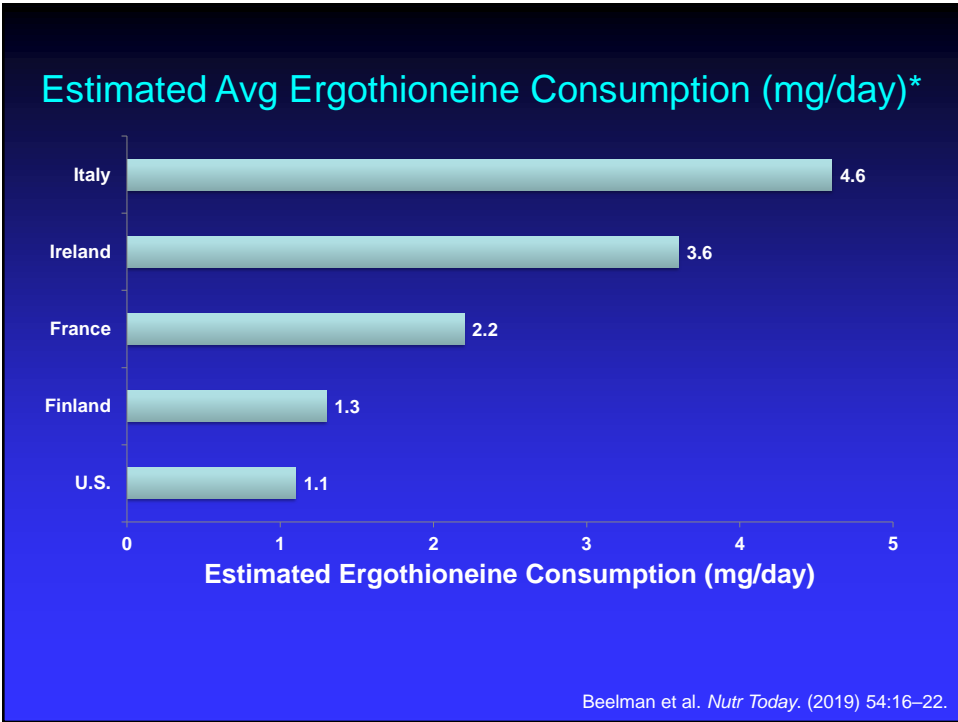
Decline of ergothioneine in frailty and cognition impairment

Hiroshi Kondoh¹ , Takayuki Teruya², Masahiro Kameda¹ and Mitsuhiro Yanagida²

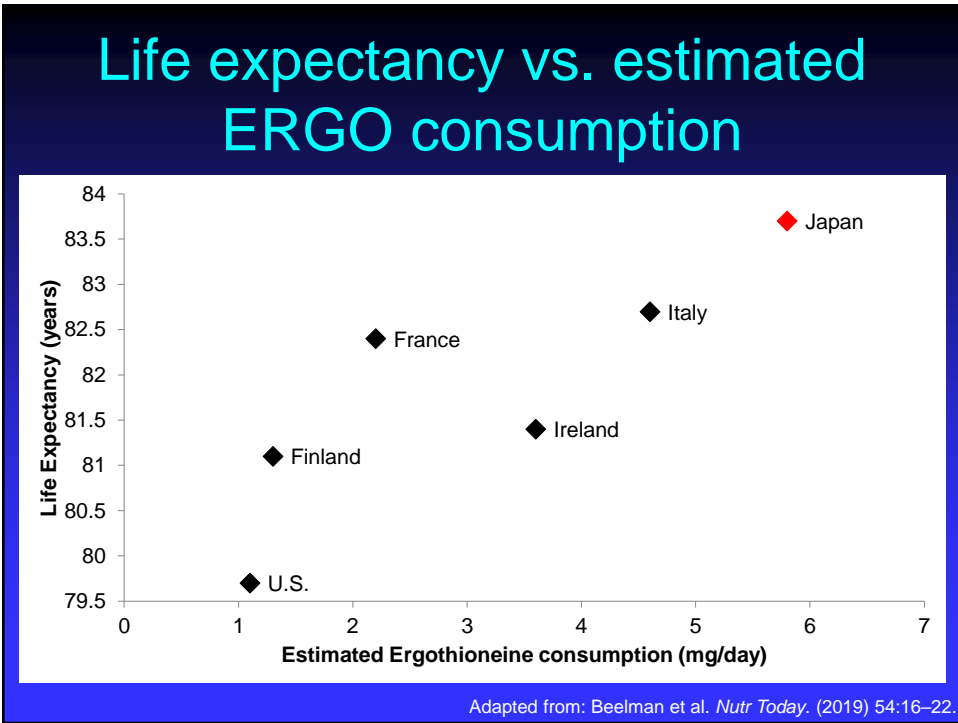


Kondoh et al. *FEBS Letters*. (2022) 596 (10), 1270-78.

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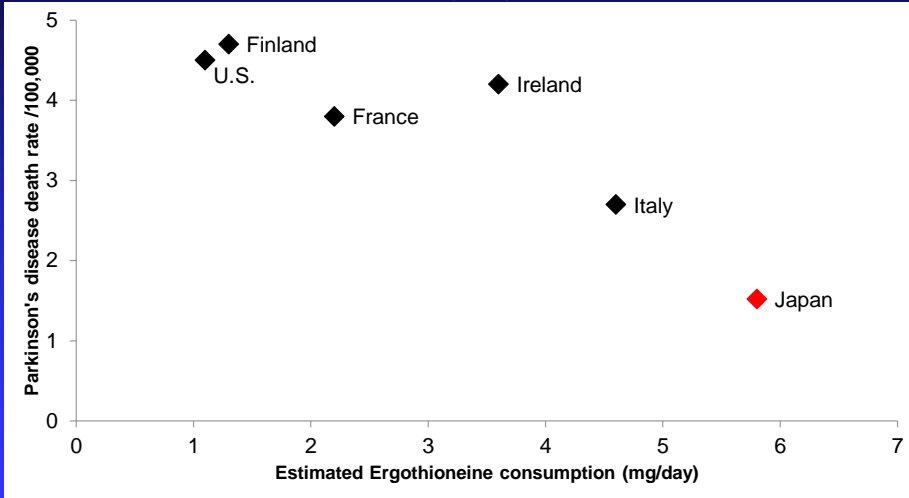


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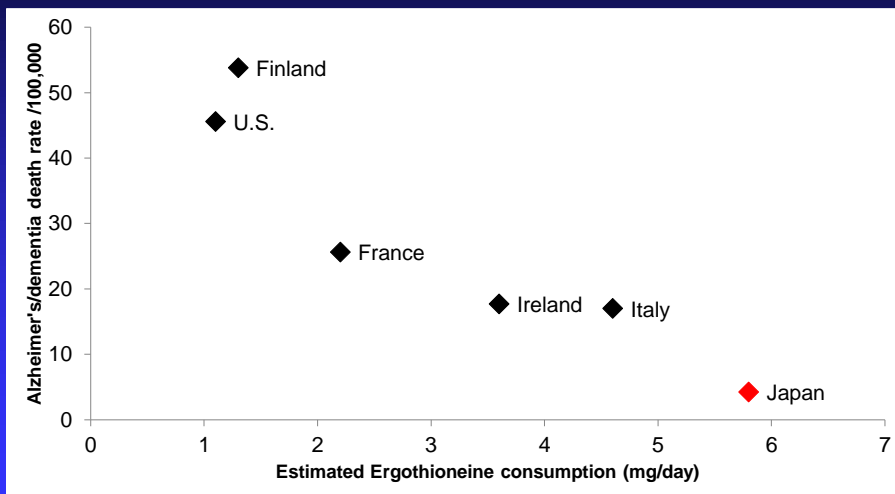
Parkinson's Disease Death Rate



Adapted from: Beelman et al. *Nutr Today*. (2019) 54:16–22.

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Alzheimer's/Dementia Death Rate

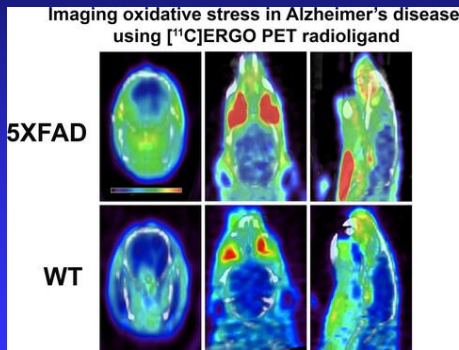


Adapted from: Beelman et al. *Nutr Today*. (2019) 54:16–22.

16

Improved synthesis of an ergothioneine PET radioligand for imaging oxidative stress in Alzheimer's disease

William J. Behof^{1,2}, Clayton A. Whitmore^{1,2}, Justin R. Haynes^{1,2}, Adam J. Rosenberg^{1,2}, Mohammed N. Tantawy^{1,2}, Todd E. Peterson^{1,2}, Fiona E. Harrison^{3,4,5}, Robert B. Beelman⁶ , Printha Wijesinghe⁷, Joanne A. Matsubara⁷ and Wellington Pham^{1,2,4,5,8,9,10,11} 





L-Ergothioneine (ERGO) is a natural antioxidant capable of scavenging reactive oxygen species and transition metals. This work reports the robust synthesis of a novel [¹¹C]ERGO PET radioligand to visualize ERGO in action. Here, using the preclinical animal models, we show that the probe could report the threshold levels of oxidative stress in Alzheimer's disease.

Behof et al. *FEBS Letters*. (2022) 596 (10), 1279-1289.

17

Longitudinal Consumption of Ergothioneine Reduces Oxidative Stress and Amyloid Plaques and Restores Glucose Metabolism in the 5XFAD Mouse Model of Alzheimer's Disease

Clayton A. Whitmore^{1,2}, Justin R. Haynes^{1,2}, William J. Behof^{1,2}, Adam J. Rosenberg^{1,2} , Mohammed N. Tantawy^{1,2}, Brian C. Hachey³, Brian E. Wadzinski⁴, Benjamin W. Spiller⁴, Todd E. Peterson^{1,2}, Krista C. Paffenroth^{4,5}, Fiona E. Harrison^{5,6,7} , Robert B. Beelman⁸, Printha Wijesinghe⁹, Joanne A. Matsubara⁹ and Wellington Pham^{1,2,5,7,10,11,12,13,*}

- Treating 5XFAD mice with ERGO reduced amyloid plaques, oxidative stress and reduced glucose metabolism
- ERGO has potential to prevent AD

Whitmore et al. *Pharmaceuticals* (2022) 15, 742.

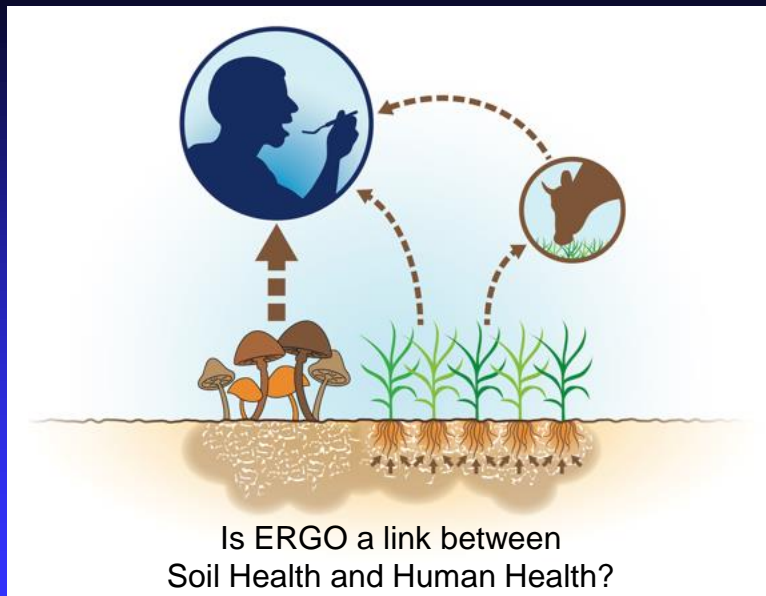
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Is Ergothioneine, a “longevity vitamin” limited in the American Diet?



Beelman et al. *J Nutr Sci.* (2020) 9:e52:1–5.

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Beelman et al. *J Nutr Sci.* (2020) 9:e52:1–5.

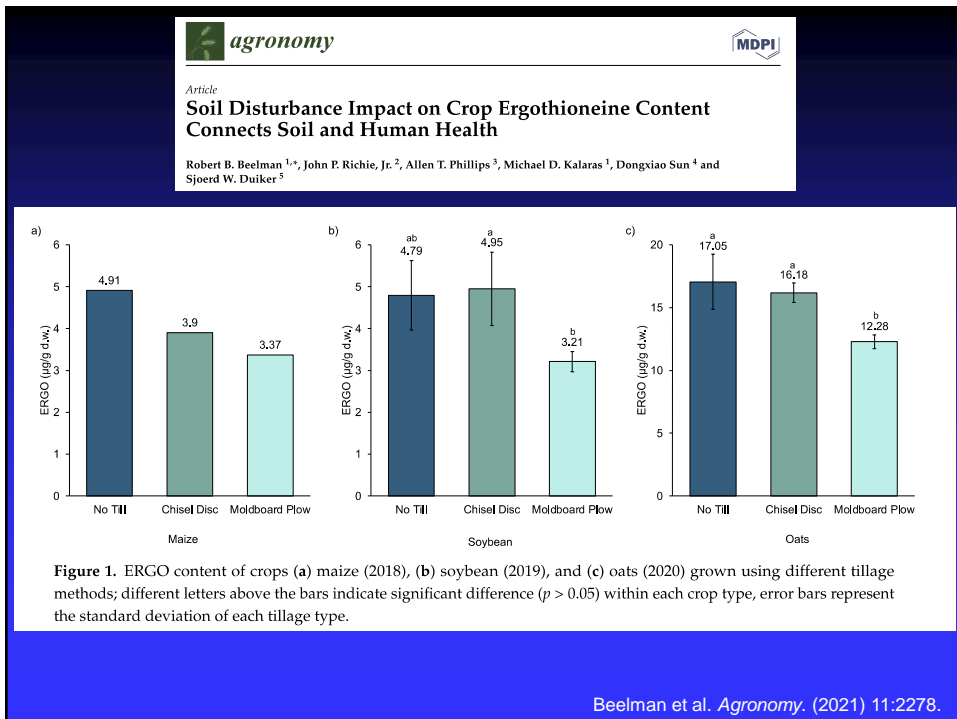
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Dr. Sjoerd Duiker



Professor of Soil Management and Applied Soil Physics

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The Wade Heller Lab USDA / ARS



- Reducing tillage increases fungal colonization of roots
- Increased crop ERGO

23

Regenerative Agriculture

Involves

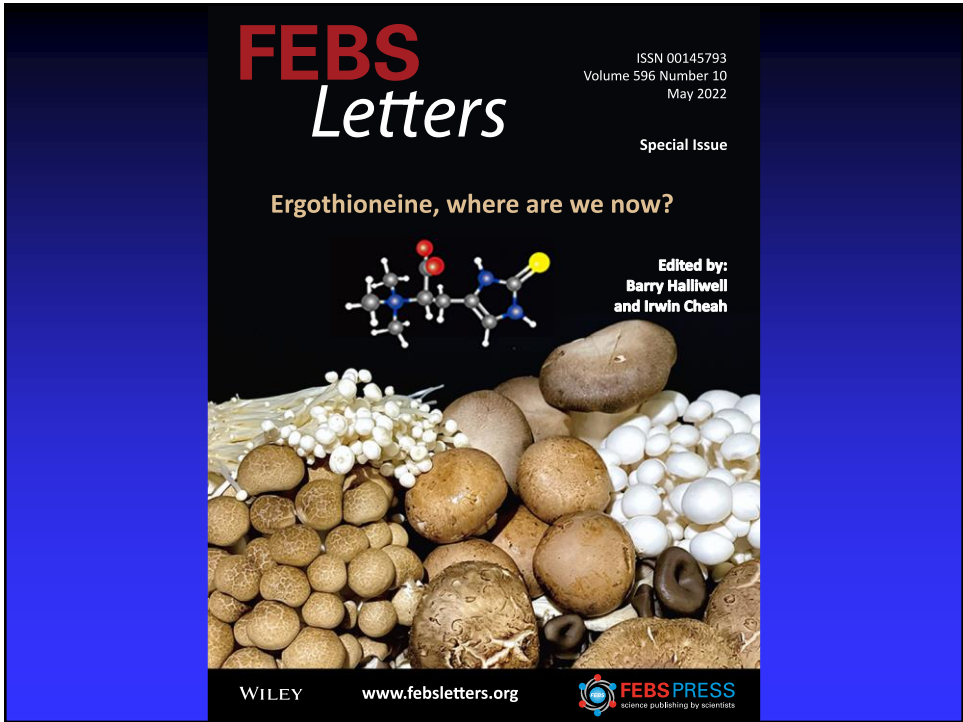
- Minimal tillage
- Cover cropping
- Multiple crop rotations
- Reduced pesticides
- Reduced chemical fertilizers

Results

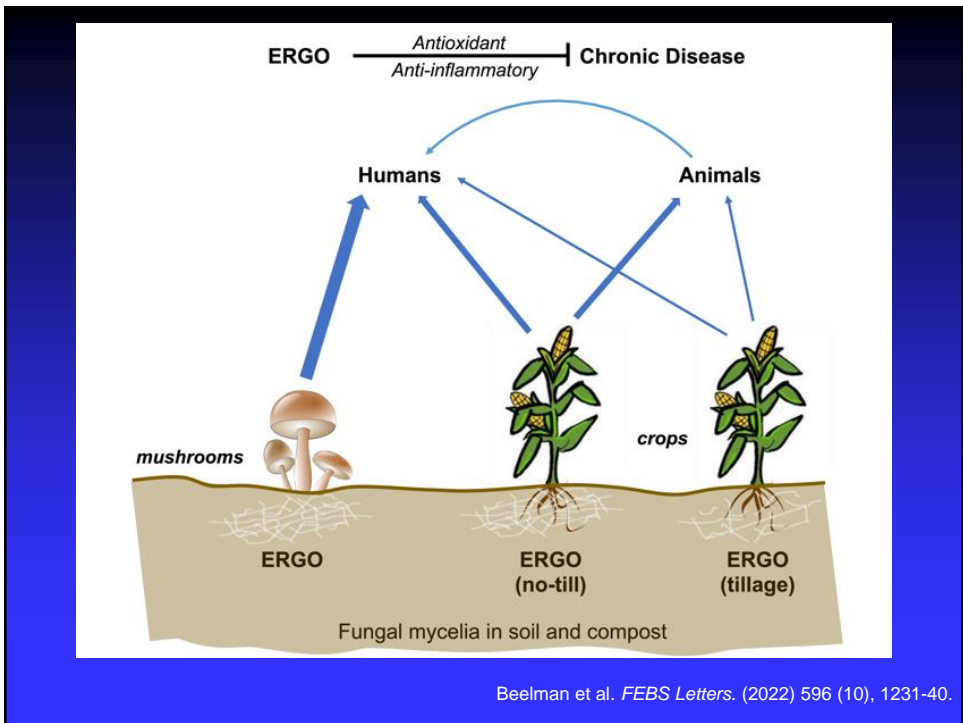
- More fungi
- More ERGO
- Reduced inputs
- Improved environment



24



25



26

Acknowledgments



Michael Kalaras

John Richie

Al Phillips

Sjoerd Duiker

Food Science: Robert Roberts, Josh Lambert, Ryan Elias, Josephine Wee
College of Medicine: Dongxiao Sun, Djibrill Ba, Zachary Bitzer
Rodale Institute: Andrew Smith & FFAR project members
Vanderbilt University: Wellington Pham, Fiona Harrison
USDA / ARS: Wade Heller; University of Delaware: Harsh Bais

27

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28



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A: Glad you could join us! 1:54 PM

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Q: Good afternoon! I'm joining from Murfreesboro, TN.
A: Good to see you here. 1:54 PM


Webinar staff to everyone
Q: Hello! Doug here, Redding California.
A: Good to see you here Doug! 1:54 PM

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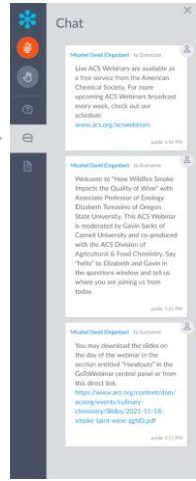


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Chat


Michael David Engstrom to Everyone
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julia 1:54 PM

Michael David Engstrom to Everyone
Welcome to "How Wildfire Smoke Impacts the Quality of Wine" with Associate Professor of Entology Elizabeth Tomasino of Oregon State University. This ACS Webinar is moderated by Gavin Sacks of Cornell University and co-produced with the ACS Division of Agricultural & Food Chemistry. Say "hello" to Elizabeth and Gavin in the questions window and tell us where you are joining us from today.
julia 1:54 PM

Michael David Engstrom to Everyone
You may download the slides on the day of the webinar in the archive window "Downloads" in the GoWebinar control panel or from this direct link: <https://www.acs.org/content/dam/acsorg/pressroom/chemistry/2023/11-18-smoke-laird-wine-agg102.pdf>
julia 1:54 PM


2

2

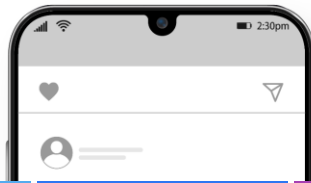


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3




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4

A Career Planning Tool For Chemical Scientists



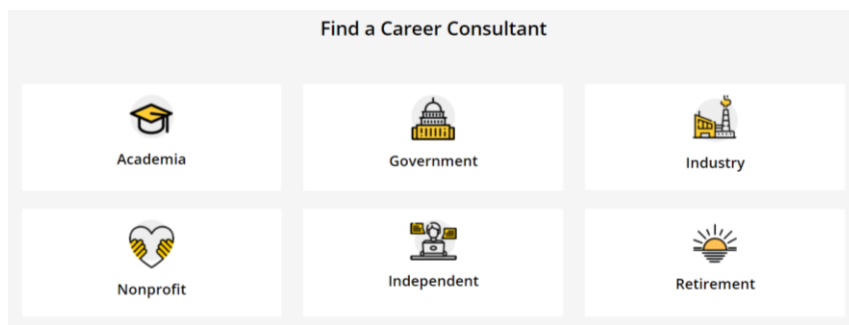
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5

5

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6

6

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7

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9

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Resources

Inclusivity Style Guide Designed to help staff and members use language and images that respect diversity in all its forms. →	ACS Webinars on Diversity Covering diversity and inclusion at the workplace →
ACS Publications DEIR Hub See what ACS Publications is doing for fostering inclusivity in scholarly publishing →	ACS Volunteer and ACS Meetings Code of Conduct Fostering a positive and welcoming environment for attendees, volunteers and staff. →
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**Adapted from definitions from the Ford Foundation Center for Social Justice:

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Seeks to ensure fair treatment, equality of opportunity, and fairness in access to information and resources for all. We believe this is only possible in an environment built on respect and dignity. Equity requires the identification and elimination of barriers that have prevented the full participation of some groups.

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The representation of varied identities and differences (race, ethnicity, gender, disability, sexual orientation, gender identity, national origin, tribe, caste, socio-economic status, thinking, and communication styles, etc.) collectively and as individuals. ACS seeks to proactively engage, understand, and draw on a variety of perspectives.

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10

10

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11

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12




Bonus Episode



By: Gina Viale and Kent Jansen

Carolyn Bertozzi and K. Barry Sharpless chat about sharing the 2022 Nobel Prize in Chemistry
December 6, 2022


Bonus Episode



By: Ariana Merritt and Gina Viale

Bioorthogonal, click chemistry clinch the Nobel Prize
October 9, 2022

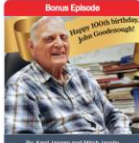
Episode #40



By: Matt Blum and Kent Jansen

Lithium mining's water use sparks bitter conflicts and novel chemistry
September 13, 2022


Bonus Episode



By: Kent Jansen and Misha Jaseby

Happy 100th birthday, John Goodenough! Stereo Chemistry revisits a fan-favorite interview with the renowned scientist
July 25, 2022


Bonus Episode



By: Kent Jansen

Jess Wade on Wikipedia and work-life balance
June 21, 2022


Bonus Episode



By: Kent Jansen

The sticky science of why we eat so much sugar
May 31, 2022


Bonus Episode



By: Kent Jansen

There's more to James Harris's story
April 27, 2022






Bonus Episode



By: Craig Bonbrunson, Kent Jansen

The helium shortage that wasn't supposed to be
March 24, 2022

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13



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14

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15

ACS Career Resources



Virtual Office Hours



<https://www.acs.org/careerconsulting.html>

Personal Career Consultations



Jim Tung

Marketing
Lacamas Laboratories

B.S., Biochemistry, University of Oregon
Ph.D., Organic Chemistry, University of Notre Dame

Jim Tung works at Lacamas Laboratories in Portland, OR, currently as a business development manager. He has been with Lacamas for 10 years, working on developing new chemical manufacturing projects. Before that, he was a senior research chemist at Oblet Research in Champaign, IL, performing kilo-scale organic chemistry.

An Oregon native, Jim got his B.S. in biochemistry from the University of Oregon, his Ph.D. in organic chemistry from the University of Notre Dame, with postdoctoral experience at Pfizer's laboratories in La Jolla, CA. He is past chair of the Portland Section of the American Chemical Society and was 2019 general co-chair of NORM 2019. He has interests in process chemistry, labor economics, social media outreach and encouraging career exploration and development for younger chemists.

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16

16

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17

17

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18

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19

19



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21

21



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22


22



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ROBERT BEELMAN, PhD

Professor Emeritus of Food Science and Director, Center for Plant and Mushroom Foods for Health, Penn State University




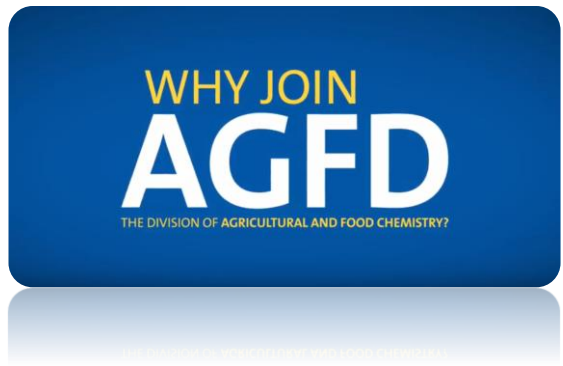
BRIAN GUTHRIE, PhD

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24



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26

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28

28