

SPECIAL EDITION

PRESERVING YOUR

MEMORY

SUMMER 2019

**Murray
M. Rubin**
1942-2019

Caregivers

Longing
for Intimacy
Advice

ALZHEIMER'S

Is it in your
genes?

Self-Care

TIPS FOR
CAREGIVERS

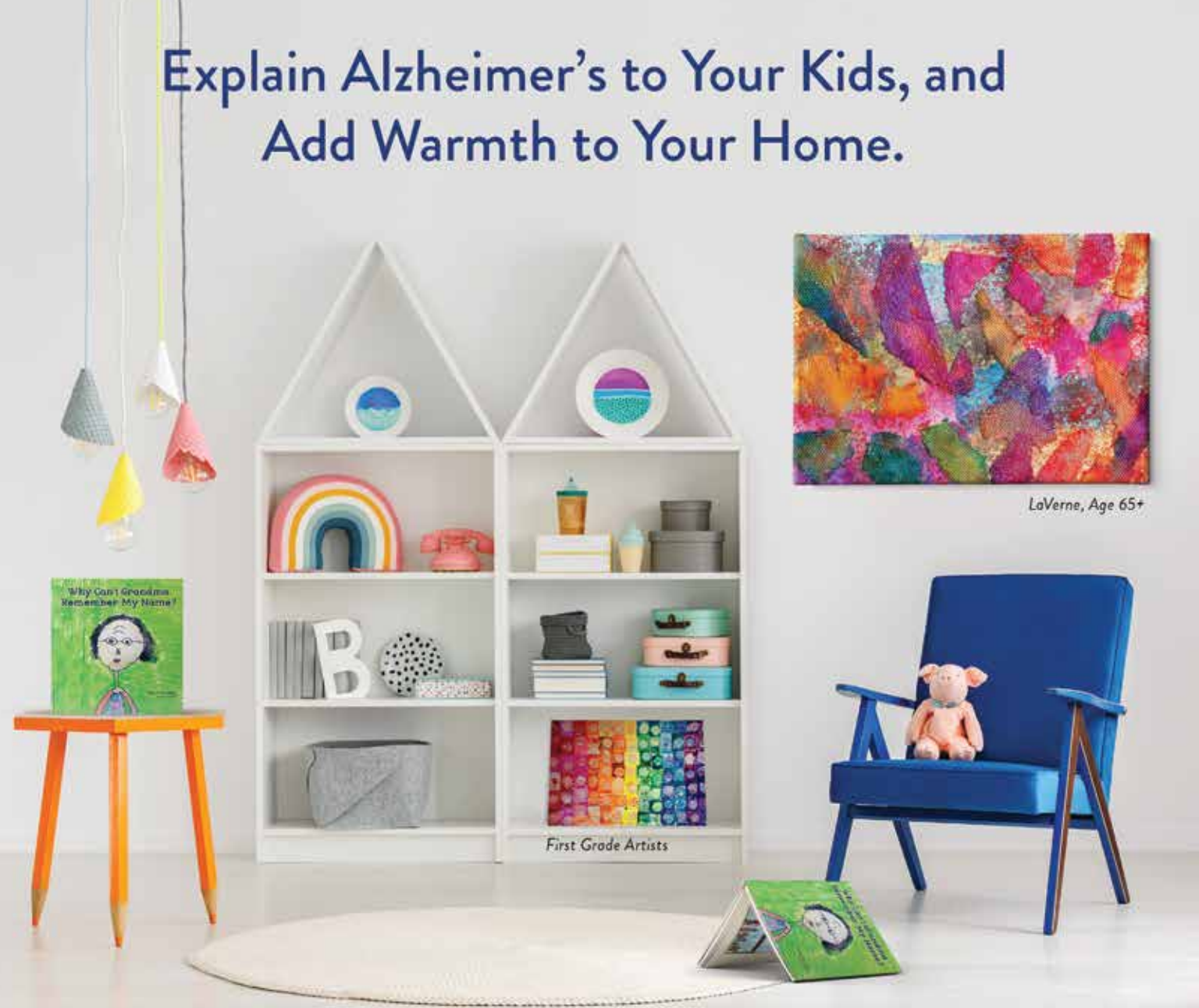
Dr. Paul Greengard
1925-2019

FISHER CENTER'S VISIONARY GENIUS



FISHER CENTER FOR
ALZHEIMER'S
RESEARCH FOUNDATION

Explain Alzheimer's to Your Kids, and Add Warmth to Your Home.



LaVerne, Age 65+

Written by Kent L. Karosen and co-author Chana Stiefel, *Why Can't Grandma Remember My Name* is a children's book that uses artwork (displayed in illustration) by children and seniors with Alzheimer's to explain the disease in a meaningful and creative way.

Purchase Book & Art Today

alzinfo.org/book

alzinfo.org/art

Together, we can end Alzheimer's!

All royalties go to Fisher Center's quest to find a cure.

ON THE COVER

Dr. Paul Greengard 1925-2019

We honor the Nobel laureate and celebrated leader of the Fisher Center for Alzheimer's Disease Research.



Dirk Westphal/The Rockefeller University

17

23

FEATURES

- 8 Murray M. Rubin: 1942-2019**
The Fisher Center Foundation lost a valued member of the Board.
- 9 When Caregivers Long for Intimacy**
Nonjudgmental advice for lonely caregivers.
- 10 Alzheimer's Disease: Is It in Your Genes?**
What you need to know.
- 12 Self-Care for Caregivers**
Handy tips for supporting yourself without guilt.

DEPARTMENTS

- 5 From the Senior Vice President's Office**
- 6 News Briefs**
- 14 Fisher Center Research**
The Fisher Center lab announces another research breakthrough.
- 16 Caregiver's Corner**
Constance Gillet shares her journey as an only-child caregiver.
- 23 Food**
Healthy Caribbean cuisine!
- 24 Long-Term Planning**
Advance directives, an important tool in planning ahead for medical care.

PRESERVING YOUR

MEMORY



FISHER CENTER FOR
ALZHEIMER'S
RESEARCH FOUNDATION

110 East 42nd Street, 16th Floor
New York, NY 10017
1-800-ALZ-INFO (1-800-259-4636)
ALZinfo.org

Lucretia Holden, Publisher
Christina Hall, Editor
Dr. Marc Flajolet, Science Editor
Jerry Louis, Graphic Designer
Toby Bilanow, Bernard A. Krooks,
Contributing Writers



Preserving Your Memory
is a product of
StayWell

407 Norwalk Street
Greensboro, NC 27407
(336) 547-8970

Sam Gaines, Managing Editor
Kasey Przybysz, Design Manager
Traci Marsh, Production Director
Julie Cooper, Dana Dinerman, Maryann Foley,
Carrie Knowles, Karen Michels, Margie Rossi-Holman,
Contributing Writers

Cover photo: Dr. Paul Greengard
Robert Reichert/The Rockefeller University

BOARD OF TRUSTEES

Zachary Fisher, Founder (1910–1999)
Barry R. Sloane, Chairman and Treasurer
Martin Edelman, Howard Lutnick, Vice Chairmen
David H.W. Turner, Secretary

Dr. Manny Alvarez	Lois Whitman-Hess
Dr. E. Ratcliffe Anderson, Jr.	James L. Nederlander, Jr.
Gerry Byrne	Richard J. Salem
Hadley Fisher	Dr. Moshe Shike
Hon. Betsy Gotbaum	

SCIENTIFIC ADVISORY BOARD

Michael W. Young, Ph.D., Chairman
Torsten Wiesel, M.D.
Cori Bargmann, Ph.D.
Hermann Steller, Ph.D.
Nathaniel Heintz, Ph.D.
Sidney Strickland, Ph.D.



Snap a photo of this QR code*
to get more information
about Alzheimer's disease!

*Download a free code reader app for your
smartphone at your phone's marketplace

For advertising information, please contact:
Fisher Center Foundation StayWell
(212) 915-1322 (336) 547-8970

© Copyright 2019 by the Fisher Center for Alzheimer's Research Foundation. No part of this publication may be reproduced or transmitted in any form or by any means without written permission from the Fisher Center for Alzheimer's Research Foundation. Articles in this publication are written by professional journalists who strive to present reliable, up-to-date health information. However, personal decisions regarding health, finance, exercise, and other matters should be made only after consultation with the reader's physician or professional adviser. All editorial rights reserved. Opinions expressed herein are not necessarily those of the Fisher Center for Alzheimer's Research Foundation.

Summer Season, Turn! Turn! Turn!

To everything
Turn, turn, turn
There is a season
Turn, turn, turn
And a time to every purpose under Heaven
A time to be born, a time to die
A time to plant, a time to reap
A time to kill, a time to heal
A time to laugh, a time to weep...



Photo by: Jodi Jones

As the simple lyrics of Pete Seeger's song "Turn! Turn! Turn!" (taken from Ecclesiastes 3:1-8) express: a time to weep, a time to mourn; we mourn the loss of Dr. Paul Greengard, who is our cover story and reason for this special issue. Dr. Greengard lived and worked for nine decades—nine decades! One can only hope to live long enough to discover one's purpose under the heavens and make an impact. Dr. G., as I fondly called him, was a trailblazing genius who made an amazing impact in the world of science. I admired his brilliant brain, twinkling blue eyes, and quick-witted sense of humor. Read about his remarkable life of service on page 17.

Also, we lost our long-time Board Secretary, Murray Rubin. He was a gentle soul who served us well. The Denver Broncos lost their owner, Pat Bowlen, after his spirited battle with Alzheimer's disease. Mr. Bowlen was on our fall 2018 cover and to read the full article, go to alzinfo.org/pymfall18.

To everything there is a season, Turn! Turn! Turn!

Read about another Fisher Center Lab breakthrough, whether or not Alzheimer's is in your genes, how to prepare for the future today with an advance directive, and information about self-care.

Turn! Turn! Turn! To everything there is a season: a time to plant, a time to reap.

Flip over to the back cover to see how you can be "ALL IN" for our summer [Alzheimer's Challenge](#).

May you embrace the invincible summer inside yourself and have a summer that is a fulfillment of promise of the earlier months.

Lucretia Holden, SHRM-CP
Senior Vice President

About the Fisher Center for Alzheimer's Research Foundation

Since 1995, the Fisher Center Foundation, a 501(c)(3) nonprofit organization, has been providing hope and help to the public by funding research into the **cause**, **care**, and **cure** of Alzheimer's disease and creating much-needed educational programs. Our internationally renowned scientists have been at the forefront of research that has provided a conceptual framework for modern-day investigations into Alzheimer's disease.

The Fisher Center Foundation has earned Charity Navigator's highest 4-Star rating for eight consecutive years for fiscal management and commitment to accountability and transparency. We are now in the top 1% of all charities rated. For more information or to make a donation, go to ALZinfo.org/donate.

Please send your stories or questions to:

Fisher Center for Alzheimer's Research Foundation
110 East 42nd Street,
16th Floor
New York, NY 10017
or by e-mail to info@ALZinfo.org



FOODS FOR BRAIN PROTECTION

Consuming dark leafy greens like spinach and lettuce, red and dark orange vegetables, berries and orange juice may be good for the brain and help keep the memory sharp in old age. Those are the results of a new study in *Neurology* that followed a group of more than 27,000 men over two decades.

The findings add to a growing body of evidence that a diet rich in fruits and vegetables, which is often recommended for heart health, may also be good for the brain. Vegetables and fruits are high in nutrients known to protect the brain and nervous system, such as antioxidants.

Earlier studies have found, for example, that older women and men who eat lots of fruits and vegetables tend to have less brain loss, which may protect against Alzheimer's disease.

See our article on brain-healthy Caribbean food on page 23. **And don't forget to try the recipe for avocado and papaya salad on page 31!**



EXERCISE TO PREVENT FALLS

Falls are a leading cause of broken hips and disability in elderly women and men, and they may even hasten death. And older people with Alzheimer's disease are especially susceptible to falls. Now a new study, in the *Journal of the American Geriatrics Society*, shows that exercise may decrease the risk of falling for older adults who have Alzheimer's disease.

In the study, women and men with Alzheimer's disease who engaged in a home-based exercise program for one hour twice a week for 12 months significantly reduced the risk of falls compared with a group that did not get exercise training. Exercise included climbing stairs, balance training, walking and outdoor activities. Various kinds of equipment were used to enhance the training, such as bikes, ankle or hand weights, balls, canes and balance pillows. Caregivers could participate in the sessions as well.

Experts recommend additional measures to help prevent falls:

- **Remove small throw rugs** or use double-sided tape to keep the rugs from slipping.
- Keep regularly used items in **easy-to-reach cabinets** that do not require a step stool.
- **Install grab bars** next to your toilet, along the tub and shower wall.
- **Use non-slip mats** in the bathtub and on shower floors.
- **Install handrails and lights** along all staircases.
- **Wear good shoes** that have support non-slip soles and avoid wearing slippers and athletic shoes with deep treads.



TO DRIVE OR NOT TO DRIVE?

When to give up the car keys is an important question for anyone caring for a loved one with Alzheimer's disease. New guidelines from Newcastle University in Britain offer questions to ask anyone whose driving judgment may be impaired by dementia, along with questions to ask family members. Circling yes for any of these questions should spark a wider discussion of whether it is time for someone to stop driving.

10 QUESTIONS TO ASK SOMEONE WITH ALZHEIMER'S DISEASE

Yes No	Have you noticed any change in your driving skills?
Yes No	Have you lost any confidence in your overall driving ability, leading you to drive less often or only in good weather?
Yes No	Do others sound their horn or flash lights at you or show signs of irritation?
Yes No	Have you ever become lost while driving?
Yes No	Have you ever forgotten where you were going?
Yes No	Do you think that at present you are an unsafe driver?
Yes No	Have you had any car accidents in the last year?
Yes No	Have you had any minor accidents with other cars in parking lots?
Yes No	Have you received any cautions or fines for speeding, going too slowly, failing to stop at a red light, etc.?
Yes No	Have others criticized your driving or refused to ride with you?

10 QUESTIONS TO ASK FAMILY MEMBERS

Yes No	Do you feel uncomfortable in any way riding with your relative?
Yes No	Does your relative need a co-pilot to alert them to potentially hazardous events or conditions?
Yes No	Are other drivers forced to drive defensively to accommodate your relative's errors in judgment?
Yes No	Have there been any occasions where your relative has gotten lost or experienced navigational confusion?
Yes No	Does your relative need many cues or directions from passengers?
Yes No	Have you noticed any abnormal or unsafe driving behavior?
Yes No	Has your relative had any recent crashes?
Yes No	Has your relative had near-misses that could be attributed to mental or physical decline?
Yes No	Has your relative received any fines or cautions?
Yes No	Have others commented on your relative's unsafe driving?

Exercise to Keep Your Brain Functioning

A new study shows just how good exercise can be for maintaining thinking skills, no matter your age. The study, in *Neurology*, found that regular aerobic activities like walking, cycling, using elliptical machines or climbing stairs improved thinking skills in people in their 20s, and that the benefits of exercise on thinking skills continued to accrue as people age.

Participants who exercised showed improvements in executive function, the ability to pay attention, organize things and achieve goals. These skills diminish with age and are strongly compromised by conditions like Alzheimer's disease.

Earlier studies have found that people with mild Alzheimer's disease may benefit from regular physical activity as well.





Murray M. Rubin

1942–2019

On March 7th, the Fisher Center for Alzheimer’s Research Foundation’s Board of Trustees’ Secretary Murray M. Rubin, 76, passed away after doing what he loved—diving with his beloved family on the beautiful island of Bonaire in the Caribbean. The island had served as his family’s second home for 21 years.

Murray graduated from Penn State University with a degree in accounting and finance, and went on to become the Chief Operating Officer/Executive Vice President of Klineman Holding Corporation, a venture capital firm located in New York City. In addition to his 9 years of service on the Fisher Center Foundation board, Murray served on the boards of the Greater Jacksonville, Florida Area USO, and Ribbons of Comfort Foundation, Inc.

Murray was a loving husband, father, grandfather, family man, friend, and philanthropist. Surviving him are his wife, Nadine; son, Stuart; daughter-in-law, Amy; grandchildren, Benjamin and Jacob; brother, Barry; and family and friends from around the world.

In lieu of flowers, donations can be made to either the Harbor Village Coral Restoration Foundation, the Fisher Center for Alzheimer’s Research Foundation, or the Jacksonville USO. All of these causes were near and dear to Murray’s heart and have a powerful impact upon those they serve.



When Caregivers Long for Intimacy

By Julie Cooper

There's a good chance you've heard of the famous former model and entrepreneur B. Smith and her husband, Dan Gasby, or a former CBS correspondent Jan Petersen and her husband, Barry Petersen. Their stories have been making the rounds from social media to newspapers and news broadcasts, from talk shows to tabloid magazines—raising a lot of eyebrows and heated debates along the way.

Their story is one that is familiar to many of the 5.8 million Americans currently living with Alzheimer's disease: Their spouses were diagnosed with early onset dementia. Gasby lives with his wife B., and Petersen lost his wife Jan a few years ago. What catapulted their particular stories into the media spotlight is that both men took the brave step of publicly revealing what many spouse caregivers would never do for fear of being ostracized: They entered into a romantic relationship with another woman while caring for their wives. Not only that, but their companions were spending a lot of time in their homes helping care for their wives.

"I think there's a tendency to want to make a judgment that this shouldn't happen, and honestly, I don't feel that it's our right to say," says sociologist Laura Gitlin, PhD, dean of the College of Nursing and Health Professions at Drexel University, and co-author of the book, *Better Living with Dementia: Implications for Individuals, Families, Communities, and Society*. Dr. Gitlin says it isn't clear how

prevalent these kinds of relationships are because there isn't much research in this area, and people don't want to talk about it because they know they'll be judged. But as families and spouse caregivers take on the "incredible set of responsibilities" that come with caring for loved ones with dementia, they've adapted in many different ways and they're making all kinds of arrangements that work for them.

The real issue, as she sees it, is not that these relationships are occurring; it's whether or not they are harmful in any way. That's what she believes really has to be evaluated—the care and home situation that supports the safety and well-being of the person living with dementia, and also the caregiver.

The reality for spouses who are caregivers is that as the disease progresses, they feel like they have "lost their wife or husband." Many experience strong feelings of loneliness and sadness. It's only natural to long for companionship and intimacy. Dr. Gitlin recommends that spouse caregivers talk with a professional—a geriatric social worker, care manager, counselor or physician—about their feelings and concerns so they can identify ways to cope effectively. They can join a support group online or in-person to get the support and reassurance they need from other caregivers so they don't feel alone.

To find a support group in your area, visit our Caregiver's Corner at alzinfo.org/treatment-care/caregivers-corner/.

Alzheimer's Disease: Is It in Your Genes?

By Dr. Marc Flajolet

When a family member has been diagnosed with Alzheimer's disease, the immediate thought is: Will I get this disease, too? Is it in my genes? If I am at risk, how can I be proactive and ward off the symptoms? With more than 5.8 million Americans living with Alzheimer's disease, this scenario seems inevitable. The answer is not simple and may not be what you think. While hereditary disease means that genetic factors (genes) are involved with certainty in causing a given disease, it also means that such factors will be passed on from one generation to the next generation. However, certain genes have been tied to specific types of Alzheimer's, but not all types. Experts are still working to find a direct link between genes and Alzheimer's disease. Still puzzled by what you just read? Read on.

GENETIC BASIS OF HEREDITARY DISEASES

Chromosomes are long fragments of DNA harboring genes. Everyone has two pairs of 23 chromosomes—one pair inherited from their father and one from their mother. Genes code for specific features like eye color.

Genes are said to be dominant or recessive. A dominant gene means that one copy of the gene is enough for the corresponding trait to be expressed. Using the eye color as an example, if the "brown eye" is dominant, an individual with one "brown eye" gene copy and one "blue eye" gene copy will have brown eyes. A recessive gene occurs when two similar copies are necessary for the corresponding trait to be expressed. If the "blue eye" is recessive, an individual with "blue eye" will need both copies for blue eyes.

THE DIFFERENCE BETWEEN FAMILIAL AND SPORADIC ALZHEIMER'S DISEASE

There are two types of Alzheimer's disease (AD) based on the underlying cause of the disease and, to some degree, on the age of onset (the age when the symptoms appear). One type is rare and is called early onset familial AD, or

eFAD. The other type, which occurs in the great majority of patients, is called sporadic AD (or late onset AD) because it appears sporadically, in the absence of strong genetic association. Typically, sporadic AD patients show the first symptoms around the average age of 65 while eFAD patients develop the symptoms at a much earlier age, possibly in their 40s and as early as in their 30s.

FAMILIAL AND SPORADIC AD: GENETIC RISK

While the genetic makeup of every individual is involved to some degree in both sporadic and early onset familial AD cases, sporadic AD is not considered a hereditary disease. Early onset familial AD, however, is considered a hereditary disease. Specifically, eFAD is an autosomal dominant disease, indicating the problematic copy of a gene coming from a single parent will suffice for the disease to develop. Statistically, if one parent carries only one copy of the problematic gene, chances of developing the disease is 50% among siblings and children. Typically, a large proportion of the individuals in a family or a tribe will develop the disease. These families will know about their eFAD genetic status and it is very rare to acquire a new mutation for a non-eFAD family.

GENES ASSOCIATED WITH eFAD

Three genes related to amyloid plaques have been found to be directly associated with familial AD cases:

- Amyloid precursor protein (APP)
- Presenilin 1 (PS1)
- Presenilin 2 (PS2)

The precise mechanisms by which these genes cause the disease remain unclear, but genetic alterations (mutations) of these genes cause an increased production of a toxic component called Abeta peptide. This component self-aggregates to form amyloid plaques, one of the disease's hallmarks. It is believed that the toxic peptide and small aggregates of this peptide are more harmful for the brain than the larger aggregates or the amyloid plaques themselves.



GENES ASSOCIATED WITH SPORADIC AD

There is no known genetic cause for sporadic AD and there is no clear hereditary component, but it does not mean that genes are not involved. This is where things get a little more complex.

Genes often come in several flavors, which are referred to as gene variants. Some gene variants might be more associated with sporadic AD than others. One such gene variant for sporadic AD is called APOE-e4. The gene APOE (for apolipoprotein E) comes in three variants called e2, e3 and e4. While the biological function of APOE-e4 is still not fully understood, it is one of the top gene variants associated with a higher frequency of developing sporadic AD. Therefore an individual carrying two copies of APOE-e4 (one from each parent) has a significantly higher risk of developing the disease.

The presence of APOE-e4 only increases the risk of developing the disease (especially if you have two copies), but it does not guarantee that the disease will develop, even if you have two copies. Some AD patients do not carry APOE-e4 variants. These two parameters are the reason why APOE-e4 is only considered a risk factor. Furthermore, other genes are involved, in addition to other parameters—hormones (e.g., male versus female), lifestyle (e.g., physical activity, diet, smoking and drinking) and the existence of other chronic diseases (e.g., diabetes and high blood pressure).

GENETIC TESTING: RECOMMENDED OR NOT?

Individuals belonging to eFAD families might want to know if they have the gene mutation. Knowing may motivate them to adjust their lifestyle in order to reduce other risk factors, such as diabetes and high blood pressure. Moreover, eFAD carriers might be interested in enrolling in clinical trials aimed at testing new therapies that are administered before the symptoms are detectable.

Individuals worrying about sporadic AD might not gain much from genetic testing. If they discover that they carry two APOE-e4 copies, this does not necessarily predict the onset of Alzheimer's disease. It might increase one's anxiety level.

It is important to note that while current FDA-approved AD treatments (all Alzheimer's disease cases included) provide temporary relief by alleviating some of the symptoms, they do not address the cause of the disease and do not modify the course of the disease. Knowing one's own risk of developing Alzheimer's will not change your treatment.

It is best to think twice before having AD genetic testing done. Sporadic Alzheimer's disease genetic testing is not recommended. The best way to be proactive in Alzheimer's prevention remains the same—maintain a healthy lifestyle. If one does elect for genetic testing, it is highly recommended to ask a professional to help you understand the results.

To learn more about Alzheimer's disease and genetics, visit alzinfo.org/understand-alzheimers/.

Self-Care for Caregivers

By Margie Rossi-Holman

What's the first rule of thumb when you're on an airplane and an oxygen mask drops down in front of you? Put on your oxygen mask before you help someone else. Caring for yourself is one of the most important—and all too often ignored—things you can do as a caregiver for a loved one with Alzheimer's disease.

Besides raising children, being a full-time caregiver can be the most challenging and rewarding job. Studies show that the combination of loss, stress and the physical demands of the job can take its toll on even the most resilient caregivers—placing them at a greater risk for depression and chronic illness than non-caregivers. Taking care of yourself is just as important as taking care of your loved one and can help you better handle your caregiving responsibilities.

Balancing the epic task of caring for your loved one and getting the physical and emotional support you need isn't easy. But you will not be able to provide the best level of care for them unless you take care of yourself, too. No matter the day-to-day demands of caregiving for a loved one with Alzheimer's or dementia, it's essential that you schedule time for your own self-care.

DON'T BE AFRAID TO ASK FOR HELP.

When someone offers to help—be it family, friends, members of your place of worship or volunteer organizations—let them. Accepting help for ordinary tasks such as grocery shopping, preparing meals, and housekeeping can free you up for time you need for yourself. You're not being neglectful of your loved one. The person you care for will benefit most when your needs are taken care of too.

KEEP ON TOP OF YOUR CAREGIVING SKILLS.

Your role as a caregiver doesn't come with an instruction manual, but there are books and plenty of online resources that can help you learn the skills you need about symptoms, treatment and managing behavior. As the disease progresses, you'll need to update your skill set and find different ways to cope.

SEEK REGULAR RESPITE CARE.

Look into volunteer organizations, day care programs, and residential respite care facilities so you can take a much-needed break. Make time for your hobbies and interests and stay on top of your own health needs. Schedule regular time away for yourself. The time away will allow you to recharge so you can provide better care and find more satisfaction in your role as a caregiver.

PLAN FOR YOUR OWN CARE.

See your healthcare provider for regular check-ups and check yourself for signs and symptoms of excessive stress. It's easy to let go of the people and activities you love when you're a caregiver, but you risk your health and well-being by doing so. Take time to maintain friendships, social connections and professional contacts, and pursue hobbies and interests that bring you joy.

MAKE TIME TO PLAY FOR AT LEAST 30 MINUTES.

Include your loved one in short walks, board games or puzzles. Throw a Frisbee for your dog or swing a golf club. A daily dose of fun is good medicine and doesn't have to cost a thing.

LOOK AT THE FUNNY SIDE OF LIFE.

Laughter is a well-known antidote to stress, sadness and illness. Give yourself permission to chuckle at the daily adventures you and your loved one experience and surround yourself with laughter. Watch a comedian and indulge in a hardy belly laugh. Your good mood can help replenish your inner resources and soothe your loved one.

BROADEN YOUR INDOOR HORIZON.

Try something new. Challenge yourself to learn a new skill while you're "on the job." Sign on to a self-paced foreign language program or try an exercise video game. "Exergames" offer home-friendly activities for every age and skill level, including dance, tennis and golf. These games engage the body and the mind—and they're fun! With a little practice each day, you can flex your mental muscle, relieve stress and stay fit indoors.

FIND A SUPPORT GROUP THAT SUITS YOUR NEEDS.

Connecting with others who know first-hand what you're going through will remind you that you're not alone. You can learn from their experiences and they may learn something from yours. Joining a group can also help reduce feelings of fear, hopelessness and isolation.

TALK TO SOMEONE WHO'S A GOOD LISTENER.

Talk to someone about how you feel and what you're going through—a friend, family member, clergy member or therapist. The person you speak with doesn't have to solve your problems; they just have to be a good listener and nonjudgmental. Simply talking face-to-face with someone who cares will not be a burden to them. They'll be flattered that you trust them enough to confide in them and it may even strengthen your bond.

The bottom line: It's normal to want to do as much as you can for your loved one. It's equally important to look after your own needs, too. Know that it's OK to take regular breaks away from caregiving. Accept help when it's offered, and be willing to ask for help when you need it. You'll be better able to stay healthy and cope with the challenges you face each day.

Read about how one caregiver made her way out of depression and into a healthier place in our article titled "My Journey as an Only Child Caregiver" on page 16. For additional resources and help on how to manage caregiver stress, visit [ALZinfo.org/treatment-care](https://alzinfo.org/treatment-care).



Another Fisher Center Lab Breakthrough **Identifies New Target in Alzheimer's**

By Sam Gaines

For years, the presence of beta-amyloid in the brain has been thought to be one of the main signifiers of Alzheimer's disease. Now, thanks to the work of Dr. Victor Bustos and the other scientists at the Fisher Center laboratory at The Rockefeller University, we now have a new culprit: a metabolite called C99. The Fisher Center team published their findings online earlier this year. C99 is being considered as a marker for neurodegenerative decline. Markers are key targets at which pharmaceutical companies target their drug therapies.

C99: THE NEW CULPRIT?

Dr. Bustos says that even though scientists believe that beta-amyloid plays a role in Alzheimer's disease, they discovered that the sites where beta-amyloid accumulates do not correlate with the sites where neurons die. For the Fisher Center scientists, this was the clue that beta-amyloid may not be the real cause of neurodegeneration, which is why they decided to focus on C99, which is intermediate in the production of beta-amyloid.

The biggest difficulty in focusing on C99 was that Fisher Center scientists didn't have a technique to measure C99 and pinpoint its localization in the brains of people with Alzheimer's disease. They enlisted the help of Maria Pulina, the first author to develop a technique to measure C99 levels in cells in culture. As a result, Fisher Center scientists were able to move very quickly into human postmortem samples. With more than 5.8 million Americans now living with Alzheimer's disease—a number expected to increase as the population continues to age—having a new marker means having a new potential target for new treatments for Alzheimer's disease.

Most efforts at targeting the plaques caused by beta-amyloid and the tangles caused by tau proteins, which were believed to be the two main markers for Alzheimer's, have come up short. To date, there are very

few treatments for Alzheimer's disease, and these only temporarily slow the disease's progression. Dr. Bustos and his team observed that C99 was present in large amounts in the areas of the brain associated with memory, but not as much in areas of the brain that Alzheimer's doesn't affect as much.

A ROBUST FINDING

He expressed how incredibly humbling it felt to be the first to see the appearance of C99 on the very neurons that are dying in Alzheimer's disease. Indeed, it is a very robust finding—neurons that are resistant to neurodegeneration have very low levels of C99, and the vulnerable neurons are full of C99. They knew they were on the right path, and Dr. Greengard immediately understood the importance of these findings from the point of view of the development of a therapy for Alzheimer's disease.

The team is careful to point out that they are not suggesting that beta-amyloid plays no role in Alzheimer's development; but, the fact is, existing medicines to treat Alzheimer's have focused on beta-amyloid and in the process raised levels of C99 in the affected areas.

Finally, Dr. Bustos says that many of the drugs tested in clinical trials have targeted amyloid, and all of them have failed to slow down the disease. There are drugs that lower amyloid and increase C99, and those drugs have worsened the disease. He and his team believe this effect is due in part to the increase in C99 levels. Their discovery should allow biotech and pharmaceutical companies to focus on lowering C99 levels.

To learn more about this study and other research being conducted at the Fisher Center lab, visit alzinfo.org/research/progress-reports. To support groundbreaking research like the C99 study, visit ALZinfo.org/donate.

My Journey as an Only-Child Caregiver

By Constance Gillet



A therapist once said to me, “Your mother was a child when you needed one and you were the adult when she needed one.” That was the special bond I had with my mother—a dance of love. We were always able to communicate with each other, sometimes without uttering a single word. This is my journey as an only-child caregiver for my mother and best friend, Lillie.

In the fall of 2005, I watched as my mother, who was a caregiver for her only sister, lose her and then two weeks later, lose her niece. The sudden deaths took a toll on my family—especially my mother. One evening my mother confided in me that she was afraid to be home alone, especially at night. Shortly after she moved in with me and my husband, she was diagnosed with Alzheimer’s disease. While I didn’t know much about the disease, I felt confident in the fact that she was already living in a safe home environment surrounded by people who loved her, she was familiar with her surroundings so we didn’t have to make any changes to her living arrangements, and we had a routine in place, which made living with this disease a bit more manageable. I personally thought my mother would enjoy her life even more and feel a sense of belonging with those key factors in place.

THE CHALLENGE OF DEPRESSION

Our love grew stronger as we depended on each other to get us through the happy and sad times. However, even with all the will I had, I noticed a decline in my mother’s cognitive abilities. Finding out that there’s no cure for Alzheimer’s disease, combined with the fact that my friends stopped calling and visiting me, really took a toll on my mental health.

The more I learned about how the disease progressed and worsened over time, the more I felt isolated—especially being an only child. The weight of caregiving was my burden to bear and the responsibility took its toll on me physically. I was unable to digest food and found

myself hospitalized for hypertension, nervous stomach, anxiety and depression.

My primary care physician recommended that I seek professional counseling to combat depression, so I sought counseling at my church and learned coping skills. I also began to understand the role of a caregiver and its importance. I felt blessed to be my mother’s caregiver and that I could keep her safe just as she had done for me for many years.

SUPPORT AND SELF-CARE

My counselor urged me to work on a plan and put it in place so that I could have more order in my life as a caregiver. As part of my plan, I arranged for my family to have group and individual counseling with the same doctor. As a result, we were all receiving the mental care that we needed. I scheduled relaxation time to help ease my work stress. I even hired a caregiver to help out sometimes, and I joined a local support group for caregivers.

Upon feeling confident, I decided to continue my education and earned my undergraduate and graduate degrees. I joined the American Public Health Association and started a company called Lillie’s Circle of Care in an effort to help myself and other caregivers.

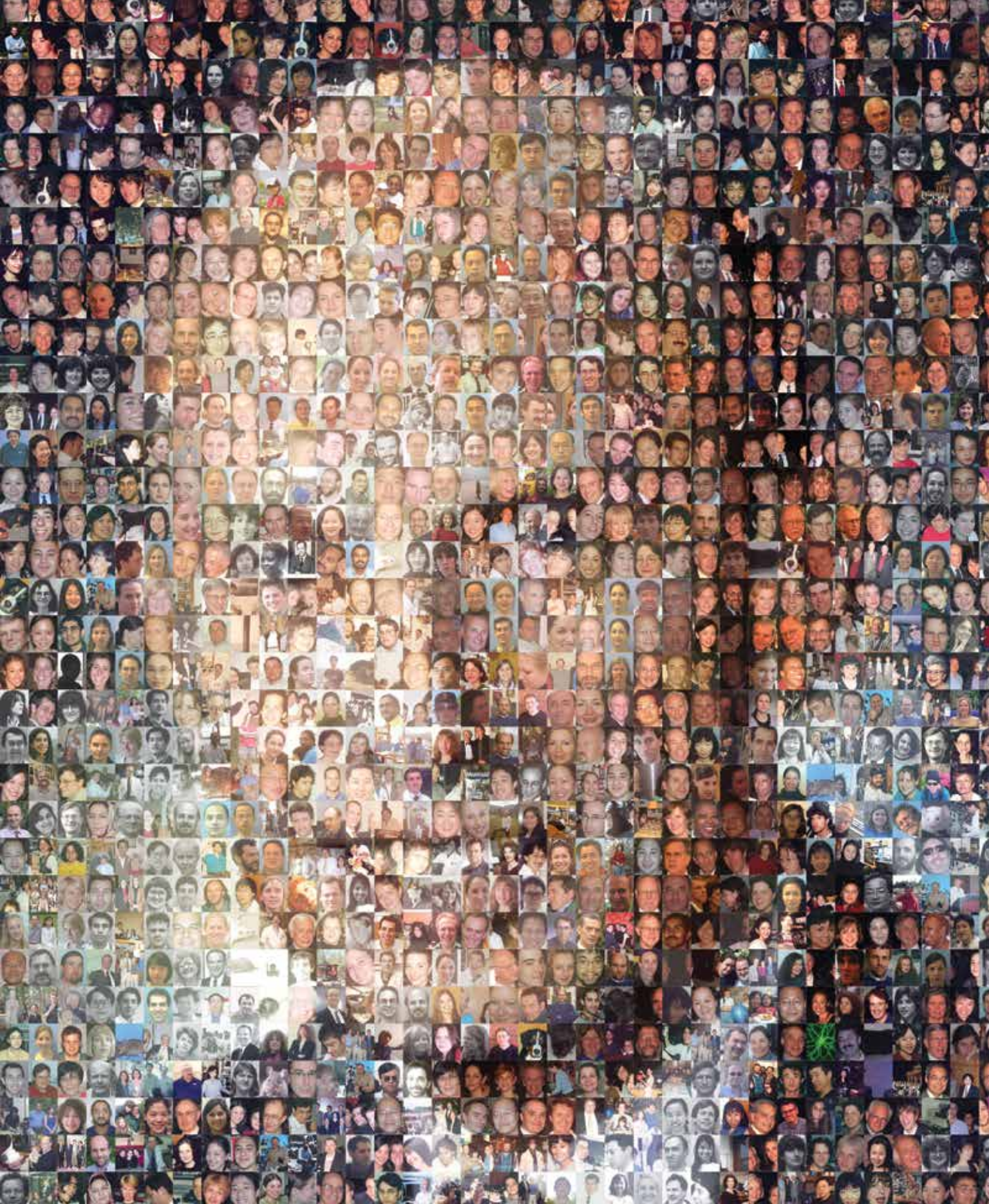
CONTINUING A LEGACY

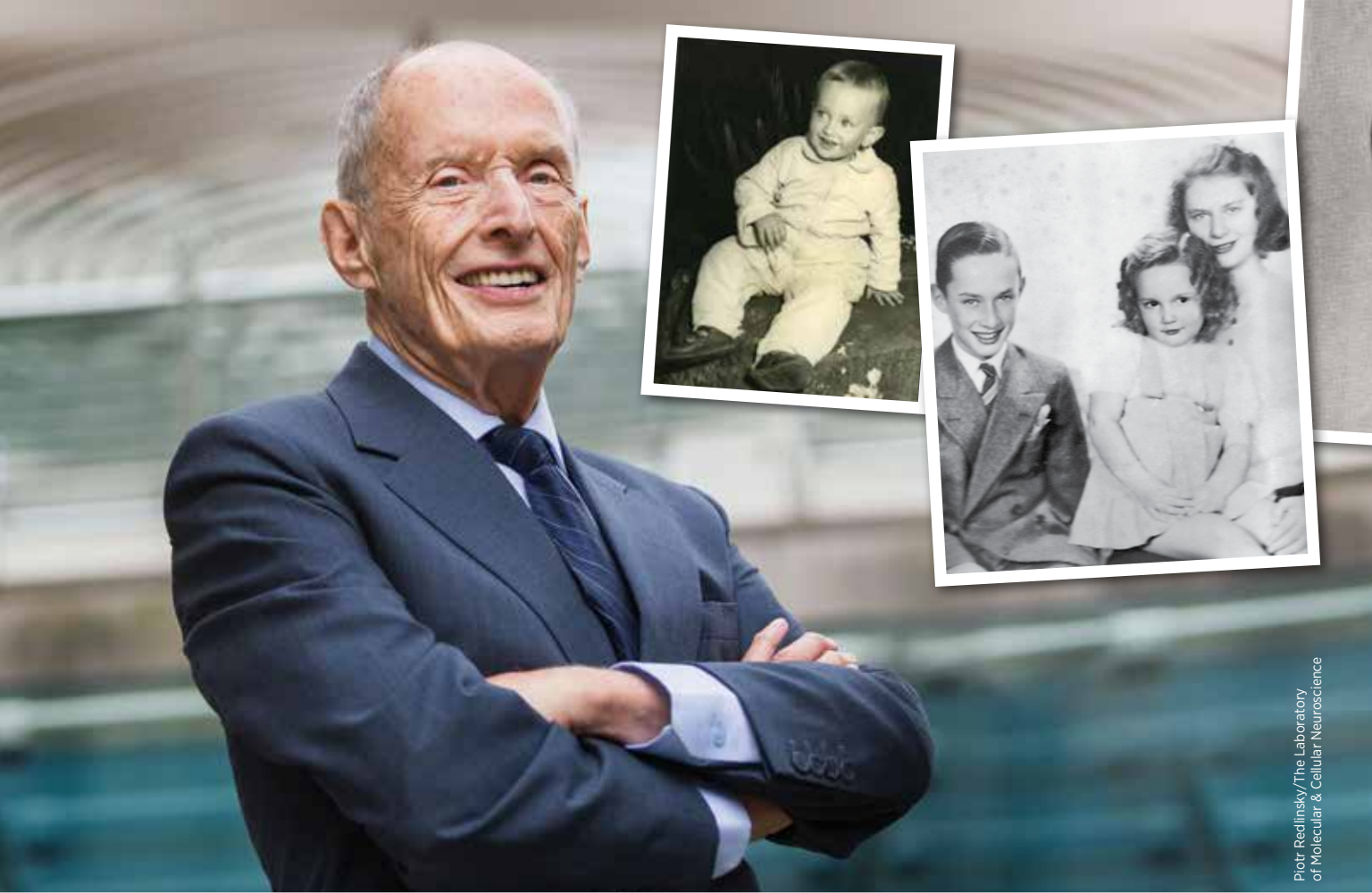
Alzheimer’s disease did not get a chance to rob my mother and me of our dance of love. Thankfully, she knew my name and her face lit up every time she saw me enter her room, but on February 1, 2018, the disease took my mother. I continued my advocacy for Alzheimer’s by reaching out to the Fisher Center for Alzheimer’s Research Foundation to find out how I could be of service. Sharing my story was a start.

Although I didn’t consider caregiving a job, I realized that as a caregiver, I had to take care of myself first and then my mother. I’m glad I scheduled doctor appointments for myself and asked family and friends for

help so that I could be a whole blessing to the person I loved.

For more tips on caregiving, please visit [ALZinfo.org/treatment-care/](https://alzinfo.org/treatment-care/).
To share your caregiver story with us, please send an email to info@alzinfo.org.





Piotr Redlinsky/The Laboratory of Molecular & Cellular Neuroscience

Dr. Paul Greengard

1925-2019

The Fisher Center for Alzheimer's Research has lost its celebrated, visionary leader.

On April 13th, the world lost a leading light in scientific research: Dr. Paul Greengard. Dr. Greengard was the founding director of the Fisher Center for Alzheimer's Disease Research at The Rockefeller University and was one of three scientists to receive the Nobel Prize in Physiology or Medicine in 2000 for his breakthrough work in discovering the pathways of signal transduction in the nervous system.

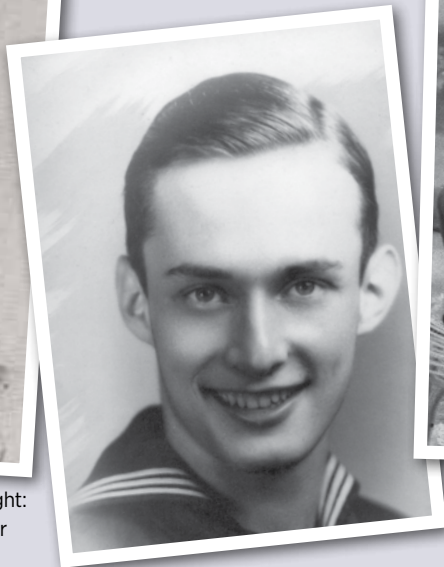
EARLY LIFE

Paul Greengard was born December 11, 1925, in New York City. His mother Pearl (nee Meister), a homemaker, died while giving birth to him, and his father Benjamin, a vaudeville performer turned perfume salesman, remarried in 1927.

A veteran of World War II, Dr. Greengard served in the U.S. Navy as an electronics technician at the Massachusetts Institute of Technology, where he worked on devising an early-warning system against the kamikaze planes of the Japanese Navy. He graduated from Hamilton College in 1948 on the GI Bill with a bachelor's degree in mathematics and physics. But since the only graduate fellowships in the theoretical physics field belonged to the Atomic Energy Commission, it meant that his only option would have been working on nuclear weapons, something he did not wish to do. A suggestion by his college roommate's parents led him to the field of medical physics, and from there he set out on his innovative course.



Facing page, left to right: Paul at The Rockefeller University; Paul as a toddler; Paul with his sisters Linda and Chris. Both courtesy of family. Above: Paul's Hamilton College yearbook portrait, 1948



Paul's Navy portrait. Courtesy of family



Paul at Yale, early 1970s. Courtesy of family



Paul viewing slides in his office. Kenneth Nemecek/MetLife Foundation

In 1953, Dr. Greengard completed his Ph.D. in biophysics at Johns Hopkins University, where he studied under the pioneering biophysicist Dr. Detlev Bronk. From there Dr. Greengard headed to England to do his postdoctoral work at the University of London, Cambridge University and the National Institute for Medical Research.

Five years later, Dr. Greengard returned to the United States to conduct research at the National Institutes of Health (NIH). From there he went on to direct the department of research at Geigy (now Novartis), and to teach at Vanderbilt University School of Medicine, the Albert Einstein College of Medicine, and the Yale University School of Medicine.

A NEW CHAPTER

In 1983, Dr. Greengard arrived at The Rockefeller University in New York City, where he established the Laboratory for Molecular and Cellular Neuroscience and later served as the Founding Director of the Fisher Center for Alzheimer's Disease Research. It was there that Dr. Greengard did much of his pioneering work in understanding how brain cells (neurons) communicate with each other. He contributed to major advances in the treatment of a wide range of neurological and psychiatric diseases. Dr. Greengard was recruited to lead the Fisher Center after a conversation between Zachary Fisher and David Rockefeller at a dinner at the Waldorf Hotel

spurred the idea for creating a research center focused on finding new treatments and a cure for Alzheimer's.

Before Dr. Greengard did his research into the subject, scientists believed that the transmissions between nerve cells were purely electrical—nerve cells communicated exclusively through neurotransmitters that sent electrical impulses to neighboring cells, a process also known as fast synaptic transmission. That's why biologists who studied the brain at that time were primarily interested in the neurons' electrical properties.

Dr. Greengard decided to veer from that position and look into the biochemistry underlying the communication between neurons. During the next 15 years, he conclusively showed that there was an alternate signaling method, which is now known as slow synaptic transmission. The biochemical modifications underlying slow synaptic transmission represent a major way by which neurons communicate with each other. This accomplishment led to his sharing the Nobel Prize in 2000.

In 1985, Dr. Greengard married the celebrated sculptor Ursula von Rydingsvard, an internationally renowned artist. Her work has been featured worldwide and throughout the U.S. "Paul was bursting with pride over his wife Ursula's remarkable career as an artist, her well-deserved awards and international recognition," recalls family friend Mette Tommerup. Similarly, Ursula always had a deep recognition for Paul and the importance of his work. At the Storm King Art Center



Ursula and Paul on their wedding day.
Courtesy of family



Paul with his family at the 2000 Nobel dinner.
Courtesy of The Rockefeller University



Paul being interviewed at
A Nobel Day in Lisbon, Portugal.
Victor Machado/Bluepeach

in New York, there is an outdoor piece belonging to the permanent collection from Ursula, and dedicated to Dr. Greengard, called “For Paul.”

Joining with his wife, Dr. Greengard used the full sum of his Nobel Prize money to create the Pearl Meister Greengard Prize, named for his mother, which recognizes outstanding contributions female scientists make to biomedical research. The award represents their shared commitment to honoring women in science, something Dr. Greengard felt was long overdue.

HIS EXPANDED CAREER

Never one to rest on his laurels, Dr. Greengard furthered his own work by beginning to explore how brain disorders might be influenced by problems in certain neural pathways. While he was involved in that investigation, he also began looking into the molecular basis of drug treatment for various brain disorders. His breakthrough work on both of these issues greatly advanced our understanding of the underlying mechanisms of neurological and psychiatric disorders—and pointed the way to new classes of drugs to treat them.

From there, Dr. Greengard began to focus on a deeper understanding of the now-familiar plaques that form in the brains of people with Alzheimer’s disease. His work contributed to the knowledge of the pathways that lead to these plaques. He also investigated the vulnerability of some brain cells to Alzheimer’s and Parkinson’s diseases, a vulnerability not all brain cells share. His work in this field has pointed to new potential treatments for these devastating diseases.

Dr. Marc Flajolet, a Research Associate Professor at the Fisher Center and a close collaborator of Paul’s for the last 20 years, reminisced that in his recent work,

Dr. Greengard attached a lot of importance to understanding why some neurons in the brains of Alzheimer’s patients are living longer (resistant neurons) compared to others that are disappearing earlier on (vulnerable neurons). “He was a leader in pioneering new technologies in the search for better treatments and a cure for Alzheimer’s disease,” he says. “His work has always been at the forefront of new technological improvements, resulting in an impressive set of state-of-the-art technologies such as Bac-TRAP profiling, brain clearing methods, single cell sequencing, opto-genetics and more.”

“Paul was an iconic scientist whose extraordinary seven-decade career transformed our understanding of neuroscience,” says Richard P. Lifton, President of The Rockefeller University. “His discoveries laid out a new paradigm requiring the understanding of the biochemistry of nerve cells rather than simply their electrical activities. This work has had great impact. Today, abnormalities in signaling among neurons are recognized to underlie many neurologic and psychiatric disorders including Parkinson’s disease, schizophrenia, depression, attention-deficit/hyperactivity disorder and substance abuse.”

At the memorial service for Dr. Greengard, friends and colleagues related how his warmth, sense of humor, keen intellect and passion for understanding characterized all of his relationships. Dr. Revathy Chottekalapanda, a Senior Research Associate in Dr. Greengard’s lab, said that Dr. Greengard was passionate about diversity, as well. “He celebrated diversity and was so proud that his current lab colleagues were from 19 countries,” she said. “He was a brilliant scientist, a fabulous mentor, and he challenged us until he got the best out of us.”



Paul with Research Team, December 2015. Courtesy of The Laboratory of Molecular & Cellular Neuroscience



Left to right: Rockefeller University President Rick Lifton, Paul Greengard, Barry R. Sloane, and Kent L. Karosen of The Fisher Center Foundation at Paul Greengard Professorship Reception, December 2016. Will Ragozzino/The Rockefeller University

At that service, Dr. Greengard’s wife, Ursula von Rydingsvard, perhaps summed him up best. “Paul’s humanity and his charm ran deep, and his intellect ran deeper still,” she said. “Countless individuals have benefited from the discoveries Paul made. ... Paul Greengard has had as full a life as any human I have ever known.”

Dr. Greengard is survived by his wife, Ursula von Rydingsvard; sister, Linda Olshein Stein; sons, Claude and Leslie Greengard; and daughter, Ursula von Rydingsvard (also known as Ursie and named for her mother); and grandchildren Daniel, Philip and Annie Greengard, and Natasha, Delfine and Emerson Greeve.



Bust of Dr. Greengard in South Korea. Mr. Joong-Hyuck Yun/ Daegu Gyeongbuk Institute of Science and Technology (DGIST)

‘The Greengard Cascade’

One of Dr. Greengard’s key discoveries was that the brain has a more complicated signaling process than was previously believed.

“Before Dr. Greengard’s time, the brain was seen as a gigantic network of wires and electric signals. Dr. Greengard brought a couple more dimensions to it. He brought the biochemistry of slow synaptic transmission; he brought cell signaling; he discovered and characterized many important proteins, signaling molecules and pathways, in what we call now the ‘Greengard Cascade,’” says Dr. Marc Flajolet, Research Associate Professor at the Fisher Center for Alzheimer’s Disease Research.

Contributions can be made to the Pearl Meister Greengard Prize at www.rockefeller.edu/greengard-prize/. You can visit the Memory Wall tribute to Dr. Greengard at ALZinfo.org/memory-wall/drpaulgreengard.

INTERIM LEADERSHIP for Fisher Center Lab

The Rockefeller University has appointed **Dr. Marc Flajolet**, Research Associate Professor, as Interim Head of the Fisher Center for Alzheimer's Disease Research Lab, and Nobel laureate **Dr. Michael Young**, Vice President for Academic Affairs, as Chair of a new Neuroscience Advisory Committee to guide the Fisher Center laboratory of the late Dr. Paul Greengard.



Marc Flajolet, Ph.D.



Michael W. Young, Ph.D.



Torsten Wiesel, M.D.

For more than 20 years, Dr. Flajolet worked as a close collaborator of Dr. Greengard. His appointment will help continue the research program until a permanent lab director is hired. In addition, Dr. Young and several other Rockefeller neuroscientists will make up the advisory committee to help steer the lab in the

months ahead. Joining Dr. Young on the committee is Nobel laureate and Rockefeller University President Emeritus Torsten Wiesel. Dr. Wiesel is co-director of the Shelby White and Leon Levy Center for Mind, Brain and Behavior at The Rockefeller University. In addition, the four other members include:



Cori Bargmann, Ph.D., who serves as Head of Science for the Chan Zuckerberg Initiative, in addition to heading a Rockefeller lab.



Hermann Steller, Ph.D., whose studies of molecular mechanisms that clear damaged proteins from neurons have opened new possibilities for Alzheimer's treatment. Dr. Greengard recognized the significance of Dr. Steller's discoveries and supported his efforts to obtain research funding.



Nathaniel Heintz, Ph.D., a leader in drug discovery, a member of the National Academy of Sciences and one of Dr. Greengard's close, longtime scientific collaborators.



Sidney Strickland, Ph.D., Rockefeller's Dean of Graduate and Postgraduate Studies and head of the University's Patricia and John Rosenwald Laboratory of Neurobiology and Genetics.

We are confident the collaborative vision set out by Zachary Fisher and Dr. Greengard to understand the causes of Alzheimer's disease, improve the care of people living with it and find a cure will continue under the interim leadership of Dr. Flajolet and steady guidance of the Neuroscience Advisory Committee.

To learn more information about the team, go to [ALZinfo.org/research/our-research-team](https://alzinfo.org/research/our-research-team) and [ALZinfo.org/about/neuroscience-advisory-committee/](https://alzinfo.org/about/neuroscience-advisory-committee/).

A Taste of the Caribbean

By Margie Rossi-Holman

What's the first thing that comes to mind when you think about the Caribbean islands? Warm, turquoise waters? Unspoiled beaches? Rum punch? From Cuba to Trinidad, these enchanted islands have long been a treasure trove of things to see and do. But what about the Caribbean food? The traditional Caribbean diet is a delicious fusion of African, Cajun and European influence, rich in fresh seafood, a variety of fruits and vegetables, and lean protein. These are blended with unique spices and fresh herbs such as garlic, ginger, cinnamon, pimento seeds, nutmeg, thyme, curry powder, scallion and scotch bonnet chilis. Caribbean cuisine is a tasty mix of many different cultures, and adopting a low-fat, low-calorie version of the Caribbean diet has many health benefits.

Beans and legumes like chickpeas, lentils, black-eyed peas, and kidney and black beans supply plant-based protein containing a variety of antioxidants and phytochemicals that can reduce the risk of heart disease, inflammation in the body, hypertension, stroke, and certain cancers. They also help to control blood glucose and cholesterol levels, and help with weight management.

Caribbean cuisine utilizes a combination of herbs and spices, rather than salt, to produce spicy, flavorful dishes. Add a little Caribbean flair to the menu at your BBQ!

Recipe: Be sure to check out our avocado and papaya salad recipe on p. 31!



Advance Directives:

PREPARE FOR THE FUTURE TODAY

By Karen Michels
Edited by Bernard A. Krooks,
JD, CPA, LL.M, CELA



What happens when someone can no longer make choices about medical care? If someone can no longer speak for themselves, how can family and medical providers know their wishes? If preparations are not made ahead of time, this situation can lead to disagreements, dissention and distress. Fortunately, there are ways to prepare. Legal documents called advance directives have been developed to answer these questions. These documents are a way to protect a person's wishes and choices by putting them into writing.

WHAT ARE ADVANCE DIRECTIVES?

Advance directives are legal documents that state a person's wishes about medical care and who they want speaking for them if they cannot speak for themselves. These documents are only used when a person is no longer able to make their own medical decisions. Laws about these documents vary from state to state. Depending on the state, an advance directive may include:

- **A durable power of attorney for healthcare.** This allows a person to designate someone they want to make medical decisions for them if they lose the ability to make decisions for themselves.

- **A living will.** This allows a person to outline what care they want or do not want in the case of certain terminal or irreversible illnesses or medical conditions.
- **Do not resuscitate (DNR) orders.** These state that a person does not want CPR if their heart stops.

Each state may allow only certain types of advance directives. See the sidebar for organizations that can help you get the information you need for your state.

WHY ADVANCE DIRECTIVES ARE ESSENTIAL

What gives life meaning? What makes a person happy to be alive? What physical and mental abilities are essential to quality of life? These can be hard questions to answer, especially for someone else. A person's beliefs, value system and life experiences all help shape their opinion about a life well-lived. But, often, these thoughts are not openly discussed. The process of developing an advance directive encourages conversation around these issues, bringing to the fore important information that can be vital when decisions need to be made. Advance directives put wishes and beliefs into writing, helping ensure that they will be respected and carried out.

DURABLE POWER OF ATTORNEY FOR HEALTHCARE

Not every decision can be anticipated ahead of time. Many states allow a person to designate someone they trust to make medical decisions for them if they are unable to decide for themselves. This person is called their agent. The agent's role—and moral duty—is to make decisions according to the preferences of the person they are speaking for. They must decide as they believe the person would decide, putting aside their own opinions and values. The agent should be someone who will support a person's wishes and stand up for them.

Each state has its own rules about who can be an agent and what an agent can and cannot do. In most states, an agent can:

- Choose or refuse life-sustaining treatment
- Consent to treatment and stop it if needed
- Access and release medical records
- Choose where care is provided

START THE CONVERSATION NOW

The ability of someone with Alzheimer's disease to understand the issues and be able to speak their wants and needs often declines as the disease progresses. So, it's best to start the discussion as early as possible. It's never too soon. Even at later stages of the disease, it may not be too late to get these documents into place.

Setting up advance directives does mean discussing issues that many people would like to avoid, but these are important issues. Choose a nonstressful time to talk; avoid busy times of the year, such as around the holidays. Find a quiet, comfortable place for everyone involved in the conversation to sit and express their concerns and feelings, without judgment. Keep in mind that in the end, it is the person at the center of the decision-making whose wishes must be followed. It's their life, and the choices are theirs to make.

Bernard A. Krooks is a managing partner of the law firm Littman Krooks LLP (www.littmankrooks.com). A certified elder law attorney, he is a past president of the National Academy of Elder Law Attorneys and past president of the Special Needs Alliance.

Putting Things in Order

- Have discussions about wishes and values.
- Designate an agent and backups as needed.
- Obtain and fill out the documents that are legal in your state. Be sure they are signed.
- Make copies of documents. Place at least one set of copies in a safe place and make sure that people know where to find them. Distribute the other copies to providers to be put into the person's medical files.
- Review these documents regularly and make updates, as needed.

Getting the Help You Need

It's a good idea to talk with an expert who is familiar with your particular state's laws around advance directives and durable power of attorney. An eldercare attorney or other law expert is ideal. Healthcare providers and social workers may also help point you in the right direction. These organizations can also help:

- **Fisher Center's Resource locator:**
www.alzinfo.org/resource-locator/
- **National Academy of Elder Law Attorneys:**
www.naela.org/findlawyer
- **CaringInfo:**
www.caringinfo.org; 800-658-8898
- **Eldercare Locator:**
www.eldercare.acl.gov; 800-677-1116
- **American Bar Association Commission on Law and Aging:** www.abanet.org/aging/toolkit/home.html; 202-662-8690
- **The Conversation Project:**
www.theconversationproject.org

Brain-Boosting Puzzles

“Use it or lose it.” The message is simple. If you don’t use your muscles, they will no longer be as effective as they should be. Of course, the brain is not a muscle; however, it has recently come to light that “mental workouts,” such as solving crosswords and other puzzles, can help ward off Alzheimer’s. In these pages, we offer a variety of different types of puzzles that will work out your various skills involving memory, deduction, and letter manipulation, and, we hope, also provide you with a ton of fun!

(Answers on page 29)

MATCH THESE

Can you match each literary character to his or her occupation?

- | | |
|--|----------------------|
| 1. ___ Bob Cratchit, “A Christmas Carol” | a. Phonetician |
| 2. ___ Rhett Butler, “Gone with the Wind” | b. Artist |
| 3. ___ Henry Higgins, “Pygmalion” | c. Architect |
| 4. ___ Howard Roark, “The Fountainhead” | d. Minister |
| 5. ___ Sam Spade, “The Maltese Falcon” | e. Nurse |
| 6. ___ Tom Joad, “The Grapes of Wrath” | f. Blockade runner |
| 7. ___ Meg March, “Little Women” | g. Clerk |
| 8. ___ Atticus Finch, “To Kill a Mockingbird” | h. Governess |
| 9. ___ Catherine Barkley, “A Farewell to Arms” | i. Lawyer |
| 10. ___ Basil Hallward, “The Picture of Dorian Gray” | j. Weaver |
| 11. ___ Arthur Dimmesdale, “The Scarlet Letter” | k. Farm worker |
| 12. ___ Silas Marner, “Silas Marner” | l. Private detective |

DROPLINE

Take the letters in the top half of each column below and distribute them in the blanks of the bottom half so that the letters read from left to right spell out a short and sweet piece of advice. The black squares are the spaces between words. One letter has been dropped in place to start you off.

G	E	H	A	O	G	O	M	U	A	N	I	O	S	O	M
H	T	E	N	N	K	O	F	P	T	E	T	M	S	N	N
E	H	L	I	C	C		U	O	G		F		E	O	T
W			O		Y		O		R		A		R		T
W															

LEAPFROG

Here’s a list of two-word phrases that are all places and social events where people gather. The letters of the two halves are in the correct order, but they overlap. All you have to do to find the place names is separate the letters.

Example: SMAHOLPLPISNG — SHOPPING MALLS

- | | |
|------------------|-------|
| 1. B PALORCTKY | _____ |
| 2. FMLAREKEAT | _____ |
| 3. STAFATIER | _____ |
| 4. BCONACNERDT | _____ |
| 5. FSHASOHIOWN | _____ |
| 6. SDQAUNCAERE | _____ |
| 7. SOGCACEMRE | _____ |
| 8. PASGCHEAONOTL | _____ |
| 9. CRLEUANSIOSN | _____ |

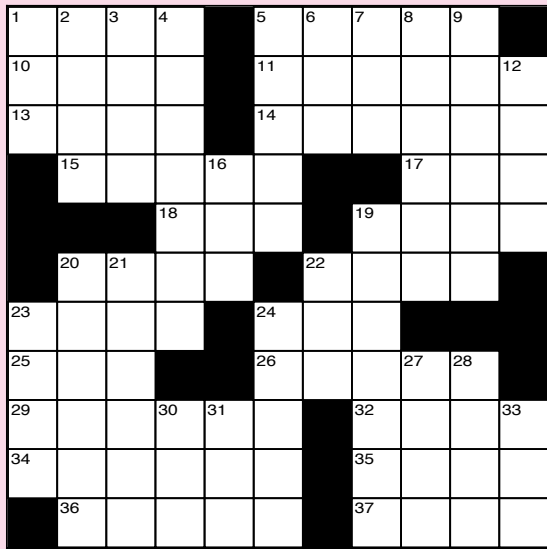
•VISIT US AT KAPPAPUZZLES.COM•



BRAIN-BOOSTING CROSSWORDS

(Answers on page 29)

We have provided two crosswords here to sharpen your puzzle skills. Start with the one on the left, which is the easier puzzle. In this one we have provided solving aids, such as the number of words in multi-word entries. The puzzle on the right is a medium-level puzzle and the number of words in the answers haven't been given. The second puzzle is also a thematic puzzle: the title "Put Your Mind to It!" is a hint. Have fun testing your knowledge while doing something that's good for you!



Across

1. Show amazement
5. Track shapes
10. Air freshener target
11. "American ___" (Richard Gere film)
13. El ___
14. Specific item
15. HBO offering
17. SSW's opp.
18. Very long period
19. Cribbage pieces
20. Hose color
22. Jelly containers
23. Side of bacon
24. Ripken of Cooperstown
25. "___ So Fine"
26. Make corrections

29. Avoided beverages
34. Formal argument
35. Parable
36. Titles
37. Director Kazan
12. Spanish hurrahs
16. Debtor's letters
19. Artist's board
20. Number of pipers piping
21. Winter melon
22. Traffic snarl
23. Cast off
24. Yields
27. Patricia
28. Artist Salvador
30. Aswan landmark
31. Paris summer
33. Adriatic, e.g.

Down

1. Elephant's party (abbr.)
2. Eden dweller
3. Just okay (hyph.)
4. Adage
5. Utah city
6. Strive
7. CIA employee (abbr.)
8. Borrower's opposite
9. Arm supports

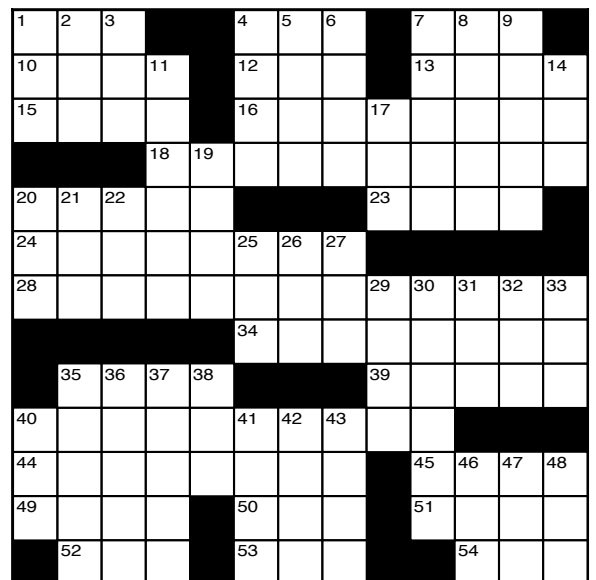
Put Your Mind to It!

Across

1. Frazier opponent
4. Draft letters
7. Pt. of speech
10. Incentive, informally
12. He runs the Springfield Kwik-E-Mart
13. Fir fruit
15. ___ torch (outdoor party staple)
16. Chicago Seven lawyer William
18. Intellectually provocative article, perhaps
20. It goes with tortilla chips
23. Catcher Carlton
24. Debar or prevent
28. Possessing proper opinions
34. Four-time Olympic discus champion
35. American petroleum company
39. Tom Mix two-reeler
40. Conformity
44. Ginsberg, Corso, or Ferlinghetti
45. Thessaly peak
49. "Quills" subject
50. Nintendo product popular with seniors
51. Proceed
52. Lithuania or Latvia, pre-1991: abbr.
53. Near-grads: abbr.
54. Dutch ___ disease
19. Sentry's order
20. Season: abbr.
21. Magnate Onassis
22. Triangle side
25. Actress Hagen
26. "The Rainbow" author's monogram
27. Between A and U
29. Sign gas
30. Site of a Polish uprising
31. "Addams Family" cousin
32. Birth name indicator
33. Guard dog's warning
35. Environs
36. Turnpikes
37. More buttonlike?
38. Against: abbr.
40. "Pygmalion" author's monogram
41. Pulls a disabled car
42. Will beneficiary
43. "How Sweet ___" (James Taylor song)
46. Visualize
47. Long-running NBC comedy show
48. Nav. chief

Down

1. Like a quick learner
2. Pacific neckwear
3. Bug
4. Satirist Munro's pseudonym
5. Took a turn on "Wheel of Fortune"
6. Like the "Titanic"
7. Height of a drama
8. Politicians Robert and Elizabeth
9. Sweater feature
11. Tacky bric-a-brac
14. Preceding, poetically
17. No. on a Coppertone bottle



BRAIN-BOOSTING PUZZLES

HIDDEN-MESSAGE WORD-FIND™

Modern politics is a contentious and unrelenting struggle. Circle the words below, and the unused letters will spell out an apt quote from Harry S. Truman.

You are looking for a 35-letter phrase.

ATTACK AD	PATRONAGE	P N S S E G A N O R T A P I
DIRTY TRICKS	PORK BARREL	P O F K O Y O U W L A U F N
FILIBUSTER	POWER	T I W T C U A F E L O I P R
IMPEACHMENT	PROTEST	N T H E I I N R A R L A A T
INFIGHTING	SCANDAL	E C I S R N R D G I R E T A
INNUENDO	SMEAR CAMPAIGN	M E N D N A N T B T I S T L
INTEREST GROUP	SOUND BITE	H J N W B A S U Y I E A A K
OBJECTION	TALKING POINT	C B S K C E S L E T T H C S
PARTISANSHIP	TALK SHOWS	A O R S R T I I O N R E K H
PARTY LINE		E O I E E N N R T G D I A O
		P T T R E O P N G R E O D W
		M N G I A P M A C R A E M S
		I N F I G H T I N G T P A D
		T N I O P G N I K L A T O G

SUDOKU

To complete the puzzle below, fill in the squares so that each digit 1 through 9 appears exactly once in each row, in each column, and in each enclosed nine-unit block.

8	9			1				
5						3	4	
			7				5	
3			1			7		
		2	8		7	4		
		9			2			3
	2				9			
	5	7						1
				4			7	6

•VISIT US AT KAPPAPUZZLES.COM•



PUZZLE ANSWERS

Match These

1g, 2f, 3a, 4c, 5l, 6k, 7h, 8i, 9e, 10b, 11d, 12j.

Dropline

When you get something for a song, look out for the accompaniment.

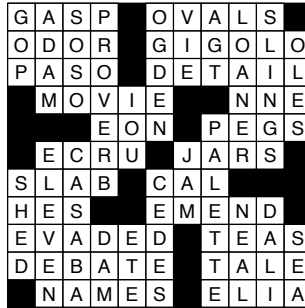
Leapfrog

1. Block party;
2. Flea market;
3. State fair;
4. Band concert;
5. Fashion show;
6. Square dance;
7. Soccer game;
8. School pageant;
9. Class reunion.

Hidden Message

If you want a friend in Washington, get a dog.

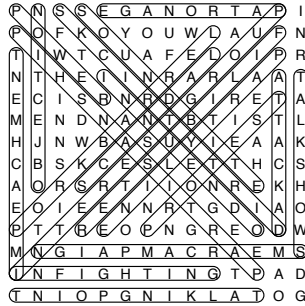
Crossword 1



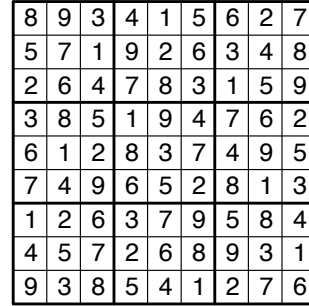
Crossword 2



Word-Find



Sudoku



YOU CAN MAKE A DIFFERENCE!

Now here is how you can do your part to support the cause to find a cure!

Subscribe to one of these magazines, and a percentage of the proceeds will go to the Fisher Center for Alzheimer's Research Foundation.

Get your subscription today! Send this money-saving coupon and payment to:
KAPPA PUBLISHING GROUP, INC. • PO Box 433133 • Palm Coast, FL 32143-3133

USA CROSSWORD JUMBO (USJ)

\$42.00 (12 ISSUES)

\$78.00 (24 ISSUES)

ALL EASY SUDOKU (AES)

\$31.50 (9 ISSUES)

\$55.80 (18 ISSUES)

NAME _____

ADDRESS _____ APT. _____

CITY _____ STATE _____ ZIP _____

E-MAIL ADDRESS: _____

VISA MASTERCARD # _____

Expiration date: ____ / ____ Signature _____

Check or Money order (Payable to KAPPA PUBLISHING GROUP, INC.)

TOTAL PAYMENT ENCLOSED

\$ _____

CANADIAN FUNDS ACCEPTED

GIFT **THIS IS A GIFT FOR:** (complete below if this is a gift subscription)

NAME _____

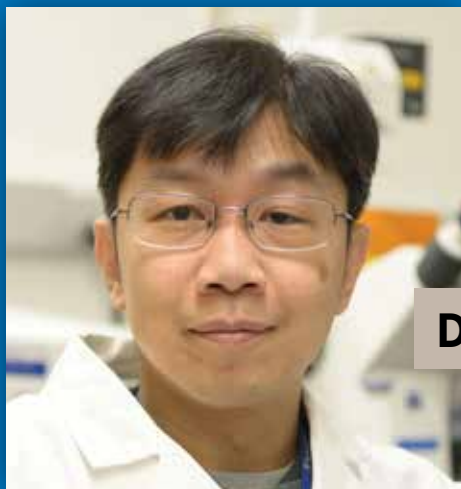
ADDRESS _____ APT. _____

CITY _____ STATE _____ ZIP _____

A8CCAR

PLEASE ALLOW 8 WEEKS FOR SUBSCRIPTION TO BEGIN. *CANADIAN FUNDS ACCEPTED; HOWEVER, OUTSIDE THE U.S. ADD POSTAGE: \$16.65-9 ISSUES; \$31.45-17 ISSUES; \$33.30-18 ISSUES. OUTSIDE U.S. AND CANADA, PAY WITH CHECK DRAWN ON A U.S. BANK OR A MONEY ORDER ISSUED IN U.S. FUNDS. OFFER EXPIRES 12/31/2019.

Fisher Center Scientist Spotlight



Dr. Jerry Chang *Research Associate*

HOMETOWN:

Jerry was born and raised in Taiwan, a tropical island in East Asia.

FUN FACT:

Jerry has been fascinated by photography since he was 14 years old, after experimenting with his grandfather's Nikon SLR camera. He spent hours shooting pictures in his teenage years. It's fair to say that his current position is a dream job where he can combine his interests in photography by taking pictures with a half-million-dollar microscope and get paid for it!

EDUCATION:

He received his Ph.D. in Chemistry from Vanderbilt University, where he completed his graduate work in the laboratory of Drs. Sandra J. Rosenthal and Randy D. Blakely. During his time at Vanderbilt, he focused on developing novel imaging approaches to elucidate the molecular basis of major depressive disorder. His research led to eight first-authored publications, including a featured cover story in *Journal of Physical Chemistry Letter*. After graduation, he joined the Fisher Center lab at Rockefeller University led by the late Dr. Paul Greengard, where he is now a Senior Research Associate and continues to apply advanced imaging techniques to aid the understanding of Alzheimer's disease.

RESEARCH DISCOVERIES:

In the Fisher Center Laboratory, Jerry works closely with other scientists to discover several proteins that regulate vesicular trafficking pathways in the progression of Alzheimer's disease. Using high-resolution live-cell imaging approach, Jerry helped to define the contribution of adaptor complex AP2/PICALM in autophagy. Autophagy is a biological process involved in the clearance of APP-CTF, a key protein substrate cleaved by gamma-secretase to generate beta-amyloid, known to be crucially involved in the onset of Alzheimer's. More recently, he adapted another advanced microscopy technique termed fluorescence recovery after photobleaching (FRAP) to help determine the role of the COPI complex found in the early trafficking protein pathway of amyloid precursor protein (APP), a protein that causes the development of Alzheimer's. Both results were published in the scientific journal *Proceedings of the National Academy of Sciences*.

Jerry is also an Adjunct Senior Research Associate of the Chemical Biology Program at Memorial Sloan Kettering Cancer Center (MSKCC), where he played a key role in the collaboration between the late Dr. Greengard and Yueming Li. The two laboratories joined forces to explore new links between beta-amyloid and Alzheimer's disease via gamma-secretase activating protein (GSAP), a protein discovered by former Fisher Center scientist Dr. Gen He (published in *Nature* in 2010) that selectively increases beta-amyloid production and represents an attractive therapeutic target for the treatment of Alzheimer's disease. By using advanced imaging approaches, including single vesicle tracking and super-resolution microscopy, Jerry has found strong evidence that indicates that GSAP controls beta-amyloid production by regulating cell surface trafficking of APP. Jerry has also discovered how beta-amyloid polymerization and fibril formation are regulated by ApoE (the most common gene associated with late-onset Alzheimer's disease) through the combination of fluorescence correlation spectroscopy (FCS) and atomic force microscopy (AFM) techniques. Both projects are near the final stages and may result in two manuscripts for publication by the summer of 2019.

**Thank you
Dr. Jerry Chang**
for your hard work every day
in the quest to find a cure.

Thanks to the outstanding work of Fisher Center's world-renowned scientists, **we are getting closer to finding a cure!**



Avocado & Papaya SALAD

This refreshing, simple African Caribbean salad recipe captures the flavors of the tropics. Although high in fat, the type that comes from avocados is healthy monounsaturated fat that can help lower your cholesterol level. They are also a good source of folate, fiber, and vitamins C and K.

INGREDIENTS

4 avocados	1 clove garlic (minced)
4 papayas (peeled, halved and seeded)	¼ teaspoon sugar
2 limes (zested and juiced)	½ teaspoon freshly ground black pepper
2 baby gem lettuces	½ teaspoon cayenne pepper
1 small red onion (finely diced)	¼ cup olive oil
2 handfuls of cherry tomatoes (halved)	

DIRECTIONS

1. Slice the avocado lengthwise into ½ inch slices. Slice the papaya width-wise into ½ inch slices. Drizzle with juice of 1 lime immediately.
2. Arrange slices overlapping and alternating on a bed of baby gem lettuce, then add the cherry tomatoes and onions.
3. In a small bowl combine remaining ingredients, mix well, spoon over the salad and serve immediately.

Serves 4

Prep time
15 minutes

Nutrition information Serving size: 1 cup. Per serving: 186 calories; 18 g total fat (1 g saturated fat); 6 g fiber; 12 g carbohydrates; 2 g protein; 0 mg cholesterol; 10 g sugars; 0 g added sugars; 75 mg sodium; 474 mg potassium

Source: "British Heart Foundation: Traditional foods—Healthy African Caribbean dishes"

Coconut Popsicles

This dairy-, gluten-, and egg-free icy treat are light, refreshing, and super creamy. The fresh coconut meat not only adds nutrients to this recipe, it also deepens the coconut flavor and adds a great crunch to these popsicles. Serves 4

INGREDIENTS

½ cup fresh coconut meat, chopped (or unsweetened, dried coconut flakes)
1 13.5 oz. can full-fat coconut milk
2-3 tablespoons raw honey (or your favorite sweetener)
½ teaspoon unflavored powdered gelatin
1 teaspoon vanilla extract
pinch of fine ground salt
2 tablespoons water

DIRECTIONS

1. Add water and gelatin to a large bowl.
2. Bring coconut milk slowly to a boil over medium heat. Then pour it into the bowl with the gelatin and whisk till gelatin dissolves.
3. Whisk in honey, vanilla, and salt.
4. Distribute the chopped coconut meat in the popsicle mold, then fill each with the milk mixture.
5. Freeze for about 5 hours or overnight before removing from the mold.



Nutrition information Serving size: 1 popsicle. Per serving: 63 calories; 3 g total fat (3 g saturated fat); 1 g fiber; 6 g carbohydrates; 1 g protein; 5 g sugars

Zachary & Elizabeth M. Fisher Center
for Alzheimer's Research Foundation
110 East 42nd St, 16th Floor
New York, NY 10017



ALZHEIMER'S **CHALLENGE**

Join the team this Summer.
Be part of the solution.

[ALZINFO.ORG/TEAM](https://alzinfo.org/team)



Scan the QR code with your mobile device
to start a team.

Alzheimer's is a challenge that affects us **all!**

★★★★ We consistently receive top awards and ratings for our accountability. ★★★★★

TICKET