

RETINA RESEARCH FOUNDATION NEWSLETTER

Foresight for Sight

Number 2/2013

Ronald A. DePinho, MD RRF Lecturer at the 44th Anniversary Luncheon May 15, 2013



Since its establishment in 1969, Retina Research Foundation has worked to sponsor research in vision science with special emphasis on retina research. Research and education have been the twin pillars of strength, and the RRF Luncheon has always been an opportunity to feature new developments in science or academics in an interesting way.

Following a long tradition of inviting speakers who are outstanding leaders of the academic and medical community, this year RRF was pleased to welcome Dr. Ronald A. DePinho. Dr. DePinho is President of The University of Texas MD Anderson Cancer Center in Houston. His research program has focused on the molecular underpinnings of cancer, aging and degenerative disorders and the translation of such knowledge into clinical advances.

Dr. DePinho's presentation, "Understanding and Reversing Aging," focused on the importance of research in solving the puzzles of aging and in identifying which factors influence the aging process. Thank you, Dr. DePinho!



**1. Ronald A. DePinho, MD
RRF Lecturer**

**2. with Alice McPherson, MD
RRF President**

**3. with Frank Eggleston, DDS
RRF Chairman of the Board**

**4. with Milan Jamrich, PhD,
and Kathleen Mahon, PhD
Research scientists**

New Type of Retinoblastoma Identified



5.

Timothy Corson, PhD, is a member of an international team of researchers that has recently discovered that not all forms of retinoblastoma may be inherited. This childhood eye cancer is known to be caused by a mutation of the RB1 “retinoblastoma gene,” but this new study is good news for those children who have the disease but are identified as having a normal RB1 gene.

The international team of 25 researchers was led by senior author Brenda L. Gallie, MD, of the Princess Margaret

Cancer Centre in Toronto, Canada, and included researchers from the Netherlands, France, New Zealand and Germany. Their paper was based on a study of more than 1,000 retinoblastoma patients and has been published in *Lancet Oncology*.

Dr. Corson said this new group of retinal tumors has a normal RB1 gene and appears to be “driven” by extra copies of a cancer-causing gene called MYCN, a gene most commonly associated with another childhood cancer, neuroblastoma.

“Our study suggests that one in five patients with an early-onset tumor in a single eye may have MYCN retinoblastoma, and thus lack future risks,” said Dr. Corson, assistant professor of ophthalmology, biochemistry and molecular biology at the Indiana



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University School of Medicine. This discovery could spare these



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5. *Timothy Corson, PhD*

6. *Brenda Gallie, MD*

7. *Glick Eye Institute,
Indiana University
School of Medicine*

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How the Brain 'Sees' a Fastball

University of California at Berkeley scientists have recently solved a long-standing puzzle of how the human brain can react to objects moving with great speed through space, too quickly to track with the eye. Major League fastballs average 90 miles/hour, and yet elite athletes are able to successfully make contact. How can this be?

In that split second, much has to be accomplished. First the eyes must find the ball. The sensory cells in the retina determine its speed and rush this information to the brain. Finally, the brain sends messages through the spinal cord that tell muscles in the arms and legs to respond. "By the time the brain receives the information, it's already out of date," said Dr. Gerrit Maus.

Dr. Maus, lead author of a paper published in the journal *Neuron*, has discovered that objects speeding through space are perceived by the brain as further along in their trajectory than seen by the eyes, giving us time to respond.

This "sophisticated prediction mechanism," identified by Dr. Maus, compensates for the slow route from the eyes to neural decision-making. According to Dr. Maus, "As soon as the brain knows something is moving, it pushes the position of the object moving forward, so there's a more accurate measure of where this object actually is." This is useful in survival situations far more important than sports — such as when we're navigating through heavy traffic.

A region in the back of the brain, called area V5, computes information about motion and position — and projects where it thinks the ball should be, rather than where the eyes saw it.

The finding could also help explain why altered trajectories can fool us — such as baseball pitches with so-called late break. A clearer understanding of how the brain processes objects in motion can eventually help in diagnosing and treating many disorders, including those that impair motion perception, according to the UC Berkeley team. People who cannot perceive motion are unable predict locations of moving objects, resulting in difficulty performing many simple tasks.

www.thestar.com



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8. *Gerrit Maus, PhD*

9. *Fastball*

Zebrafish Playing Special Role in Genetic Research

University of Alberta researchers led by Dr. Ted Allison have recently discovered that the stem cells of a zebrafish can selectively regenerate damaged photoreceptor cells, being instructed to only replace the cones in its retina. This finding may lead to new answers in repairing damaged retinas and returning sight to people with impaired vision.

Rods and cones are the most important photoreceptors and serve different functions. In humans, rods provide us with night vision while cones give us a full color look at the world during the daytime. “This is the first time in an animal research model that stem cells have only repaired damaged cones,” said Allison. “For people with damaged eyesight, repairing the cones is most important because it would restore daytime color vision.” To date almost all success in regenerating photoreceptor cells has been limited to rods, not cones. Most of these earlier experiments were conducted on nocturnal rodents, animals that have many more rods than cones and require good night vision.

“This shows us that when cones die in a cone-rich retina, it is primarily cones that regenerate,” said Allison. “This suggests the tissue environment provides cues to instruct stem cell how to react.”

The researchers say this study shows some hope for stem cell therapy that could regenerate damaged cones in people, especially in the cone-rich regions of the retina that provide daytime vision. Dr. Allison believes the next step for his team is to identify the particular gene in zebrafish that activates repair of damaged cones.

www.sciencedaily.com



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10. *Ted Allison, PhD*

11. *Zebrafish*

Blind Student Athlete Leaps to Success

Charlotte Brown, a high school student near Dallas, Texas, is legally blind and recently competed in the Texas track and field state championships in Austin. Although she had hoped to medal, she was an inspiration to all when she competed in the pole vault event and placed eighth in the state. Charlotte was born with normal vision but began losing her sight as an infant, now being unable to make out shapes or colors.



In order to compete in the pole vault event, Charlotte has figured out ways to track her movement through space. First, she places a special 80-foot strip of artificial turf beside her running lane. The contrast of light and dark between the artificial turf and the running lane allow her to maintain a straight path as she runs up to the jump. Timing the jump is accomplished by counting her steps as she approaches. Her coach shouts out the number of steps after she begins, and the crowd cooperates by keeping silent.

Charlotte also runs cross country and competes in the 100-meter and 200-meter events. When competing, she runs on the

inside lane to judge her position, using the contrast between the track and the infield for guidance. Her teammates wear bells on their shoes so that she can follow their paths by listening for the sound of the bells.

“I don’t think of it as an inspiration,” Brown said. “I just think I had a different circumstance and had to figure out a different way to do things. If it inspires people though, that’s awesome.”

www.mysanantonio.com

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12. *Charlotte Brown*

13. *Preparing for the jump*



New Type of Retinoblastoma Identified

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children, who are identified by molecular testing, years of medical evaluations.

The MYCN retinoblastoma has a distinctive cellular appearance to a pathologist according to Dr. Corson. Most importantly, it occurs at a very young age, is extremely aggressive and may be treatable in the future with drugs that block the activity of MYCN.

“This is a landmark discovery in retinoblastoma genetics,” said David A. Plager, MD, professor of ophthalmology at the Glick Eye Institute and director of the Pediatric and Adult Strabismus Service.

Dr. Timothy Corson, assistant professor, Department of Ophthalmology and Department of Biochemistry and Molecular Biology, Indiana University School of Medicine, is one of thirteen pilot studies funded in 2013 by RRF. Dr. Corson’s research project, *Cellular Targets of a Candidate AMD Therapy*, could lead to the development of new ways of stopping the growth of new blood vessels in wet age-related macular degeneration (AMD). Dr. Corson is studying a molecule called homoisoflavanone, derived from a medicinal plant, with potent effects on blocking blood vessel growth in a mouse model of AMD. His overall goal is determining how this molecule functions within the cell to stop blood vessel cells dividing. His laboratory has made homoisoflavanone in the laboratory for the first time, and they will “fish” for proteins in the cell that bind to homoisoflavanone, then identify these proteins and test their importance for blood vessel cell growth.



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“Science progresses best when observations force us to alter our preconceptions.”

– Vera Rubin

(American astronomer, b. 1928)

14. Dr. Corson in his laboratory

15. Corson Laboratory



Meet the Board

Michael L. Patrick

RRF Board Service
2013 to present

Career Highlights

Michael L. Patrick (Mike) graduated from the University of West Alabama with a BS degree in Business Administration and Accounting. He has worked in the telecommunications and related industry since 1974. Formerly President of Lamar Telephone Company in Alabama, Vice President of Frontier Corporation of the South and President of the Alabama/Mississippi telephone association, he is currently President and CEO of Mid South Telecommunications and President of The Harry E. Bovay, Jr., Foundation in Houston, Texas.

Affiliations

Mike is a member of the River Oaks Baptist Church, where he serves as a Deacon, and currently serves on the Sam Houston Area Council Boy Scouts of America's Board of Directors and the Philmont Scout Ranch High Adventure Camp's Ranch Committee.

Family

Mike and his wife, Eva, are native Alabamians relocated to Houston, Texas, almost 20 years ago. Eva is a retired schoolteacher who spends much of her time involved with church and other volunteer activities. Mike and Eva love many outdoor activities, which they enjoy with their Boykin Spaniel, Emma. Hiking in the mountains as a family and Mike hunting birds with Emma are special times. Mike and Eva enjoy traveling and spending time with family and friends.



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16. Mike and Eva Patrick with Emma

17. Mike and Eva in Africa

18. Mike and Eva in Africa

19. Emma



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 HANDICAPPED

Global Blindness Data

According to a recently released World Health Organization (WHO) study:

- A total of 285 million people worldwide are visually impaired; of these, 39 million are blind and 82% of the blind are over 50 years of age
- The top three causes of blindness in the 2010 estimates are cataract, glaucoma and age-related macular degeneration

There has been a worldwide decline in infectious diseases, but chronic diseases, affecting both the developed and the developing world, are still rising. Quoting from the study, “Posterior segment (retinal) diseases are a major cause of visual impairment worldwide and likely to become more and more important with the rapid growth of the aging population.”

www.who.int/blindness

SPECIAL REMEMBERANCES

IN MEMORY OF

Violette H. Kurtz
 The Kurtz family
 Christine and Arthur Schauffert

Chris Lisowski’s mother
Dan Rheinlander
 Dalyn Schriewer

Anthony Mierzwa
 Frances Ross

Mrs. Joleen Morris
 Mr. and Mrs. William H. Wahlberg
 Dalyn Schriewer

Elizabeth Smith
 Avon Smith Duson

Max Wommack
 Ben and Dalyn Schriewer
 Babette and Duane Williams
 Barbara Whites

IN HONOR OF

Suzanne Miller
 Joan Kaplan

Jacque and Joe Royce
 Dr. Patricia and
 Dr. Merle Barth



RRF accepts credit cards for donations securely online at www.retinaresearchfnd.org

Call the office for more information: 713-797-1925

Additional memorials received will appear in the next issue.