

ASP NEWS



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Note from the Editorial Committee

It is with great respect that we wish long-time newsletter editor Dr. Peter A. Ensminger the best in all his future endeavors. Dr. Ensminger masterfully assembled the quarterly newsletter for 13 years, since 2001. As the newsletter moves forward, continuing to serve as a source of communal information and as a bond for ASP members, there are very large editorial shoes to be filled.

-Jonathan Lovell

Optogenetics: Seeing and Erasing Memories

While sounds like something out of the Arnold Schwarzenegger sci-fi classic movie "Total Recall", one young scientist is really using optogenetics to visualize and erase memories in the brains of living mice. Christine Ann Denny of Columbia

University recently won an NIH Early Independence Award to apply these efforts to better understand Alzheimer's disease. Alzheimer's is devastating in the way that it slowly robs people of their memories. Not only do we not yet have a cure for the disease, we do not have a good understanding of exactly how the disease destroys memories. Using genetic techniques, Denny found a way to mark the cells that encode individual memories. When a memory forms, the neurons glow permanently with an encoded fluorescent protein. This technique can be applied to neurological manifestations of emotions such as fear using special mice that Denny created. Incredibly, in these mice optogenetics can either be used to inhibit previous fearful memories or reactivate memory recall. The rapid rise of optogenetics is extremely exciting for the neuroscience field and research like this will be used to gain groundbreaking insight into how the brain works.



We need YOU!

Please submit content (science highlights, suggested links, personal stories, etc) to the ASP News.
Email: jflovell@buffalo.edu

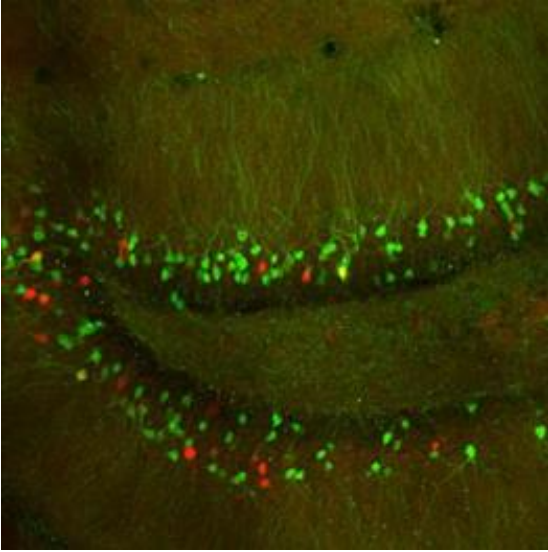


Image of the hippocampus with individual neurons encoding fear shown in green. Denny and Hen, unpublished

-Jonathan Lovell

Cancer: Sun and the Deadliest Skin Cancer in Queensland

Queensland has at least double the rates of the world's deadliest skin cancer on record – yet much of the state are unaware the rare cancer even exists.

Merkel cell carcinoma is a highly aggressive form of skin cancer, with 60 per cent of patients dying within five years of diagnosis, compared to just 7 per cent of melanoma patients. New research from Cancer Council Queensland, the University of Queensland and the Western Australia Institute of Medical Research has suggested ultraviolet radiation plays an important role in the development of Merkel cell carcinoma, contributing to Queensland's record rates.

The findings will be presented at The Global Controversies and Advances in Skin Cancer Conference, hosted by Cancer Council Queensland in Brisbane today.

Cancer Council Queensland spokesperson Katie Clift said the five-year relative survival rate for Merkel cell carcinoma was just 41 per cent, compared to 93 per cent for melanoma.

“340 cases of Merkel cell carcinoma were diagnosed in Queensland from 2006 to 2010,” Ms Clift said. “Consistent with global trends, Merkel cell carcinoma is more common in males than females in Queensland.

“As with most cancers, the best chance of survival is early diagnosis. This is particularly important for Merkel cell carcinoma as these tumours tend to grow rapidly. Our study supported the hypothesis that exposure to UV radiation was a central factor behind Queensland's record rates of Merkel cell carcinoma.

“The development of public health campaigns to educate people about this rare yet lethal skin cancer is essential.

“The research also highlights the need for the development of clinical practice guidelines that will aid in the diagnosis and management of Merkel cell carcinoma.

“Merkel cell carcinomas can be difficult to identify, and are sometimes confused with benign skin cancers. It is therefore imperative that Queenslanders get to know their own skin – if they notice a new spot or lesion, or a spot or lesion change in shape, colour or size – they should visit their GP immediately.

“We hope to see better outcomes for Merkel cell carcinoma patients in Queensland in future as a result of this research.”

-source: Cancer Council Queensland
<http://www.cancerqld.org.au>



Historian's Corner: Counting down to San Diego and ASP XXXVI

The Historian usually provides information on meetings past, but this time I will move instead into the future. The next ASP meeting is in San Diego, in the land of eternal Springtime. This is not to be missed, and I suspect maintaining a presence at the actual meeting may be a problem. Nearby is the Seaport Village, a collection of restaurants and shops where one can find anything from a seafood dinner to a new camera. A large naval base is nearby, along with an amazing collection of boats. Many have seldom seen the open sea, what with the high price of fuel, although the sailboats periodically leave the marina. The Zoo is well worth an excursion, but even more impressive is the Wild Animal Park where animals roam freely and visitors are confined. Among other sights not to be missed is the del Coronado hotel, a 1888 structure that has managed to survive in spite of being constructed almost entirely of

wood. There is even a Prince of Wales restaurant, named after a meeting between the Duke of Windsor (Edward VIII) and his future wife in 1920. Be there!!

-David Kessel

Photosynthesis: Solar Energy Cells can Learn from Nature

Solar cells optimized to suit local light conditions, or made more efficient by using a broader part of the solar spectrum, are among the imaginative applications foreseen from ground-breaking new insights into plant photosynthesis pioneered in Canada.

Indeed new, more fully detailed knowledge of how plants and other living organisms convert sunlight into energy and carbon dioxide into biomass may offer clues to addressing both the global energy crisis and global warming, says Dr. Gregory Scholes, among the world's most renowned scientists in plant photosynthesis.

"This new bio-inspired understanding will help scientists devise artificial light gathering systems that can far exceed existing solar cells in functionality, and so pave the way to new, environmentally-friendly energy technologies," says Dr. Scholes. "We can imagine, for example, solar cells that optimize themselves to suit the local light conditions or that make better use of the solar spectrum by efficiently capturing and processing light of different colours."

Studies of nature's "photosynthetic machines" have involved such organisms as fronds in kelp forests (which can grow 15 cm - 6 inches - in a single day), algae growing 20 meters - 60 feet - underwater even in winter when over 1 metre of ice covers the water - and bacteria from the South Andros Black Hole, Bahamas, which have evolved to short circuit photosynthetic light harvesting and thereby warm their local environment.

All have helped science identify some fascinating chemical physics and determine that a chain of reactions involved in photosynthesis starts with hundreds of light-absorbing molecules that harvest sunlight and 'concentrate' the fleetingly stored energy at a biological solar cell called a "reaction center."

And that happens with incredible speed. After sunlight is absorbed, the energy is trapped at reaction centers in about one billionth of a second.

New understanding of the photosynthetic process can also help alleviate the biggest looming threat to humanity -- climate change -- since photosynthesis makes use of the sun's energy to convert the greenhouse gas carbon dioxide (CO₂) into useful biomass. More than 10 quadrillion photons

of light strike a leaf each second. Incredibly, almost every visible photon (those with wavelengths between 400 and 700 nanometers -- 1 nm equalling 1 billionth of a metre) is captured by pigments and initiates the steps of plant growth.

Says Dr. Scholes: "Photosynthetic solar energy conversion occurs on an immense scale across the Earth, influencing our biosphere from climate to oceanic food webs. Energy from sunlight is absorbed by brightly coloured molecules, like chlorophyll, embedded in proteins comprising the photosynthetic unit."

"While photosynthesis does not generate electricity from light, like a solar cell, it produces energy - a "solar fuel" - stored in molecules," he adds. "Solar powered production of complex molecules is foreseen as an important contribution to energy management in the future."

Concludes Dr. Scholes: "Nature has worked out with astonishing efficiency some the riddles of fundamental importance that vex our species today," he adds. "If we are hunting for inspiration, we should keep our eyes open for the unexpected and learn from the natural sciences."

-source: Royal Canadian Institute for the Advancement of Science

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www.photobiology.org

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Upcoming Photobiology Events



Dec 4-7, 2013

Plant Genomes & Biotechnology: From Genes to Networks
Cold Spring Harbor, NY (USA)
Web site:
meetings.cshl.edu/meetings/2013/plants13.shtml

Feb 6-9, 2014

Molecules and Materials for Artificial Photosynthesis
Cancun, Quintana Roo (Mexico)
Web site:
www.fusionconferences.com/conference6.php

Apr 14-17, 2014

SPIE Photonics Europe 2014
Brussels, Belgium
Web site: www.spie.org/x12290.xml

Apr 15-17, 2014

NIWA UV Workshop
Auckland, New Zealand
Web site:
www.niwa.co.nz/atmosphere/uvozone/uv-science-workshops/2014-uv-workshop



June 14-18, 2014
ASP Biennial Meeting
Hard Rock Hotel, San Diego CA

REGISTER NOW:

www.photobiology.org

Aug 10-14, 2014

22nd IUPAC International Conference on Physical Organic Chemistry
Ottawa (Canada)
Web site:
events.science.uottawa.ca/icpoc22/welcome.html

Sep 8-12, 2014

16th International Congress on Photobiology
Universidad Nacional de Cordoba (Argentina)
Web site: www.photobiology2014.com.ar

Other Event Calendars

SPIE Events: spie.org/x1375.xml
Plant Biology Events: aspb.org/calendar
Chemistry Events: www.chemistry.org
Gordon Research Conferences: www.grc.org
Nature Events Directory:
www.nature.com/natureevents/science



37th Meeting of The American Society for Photobiology (ASP 2014)

www.photobiology.org



June 14–19, 2014

Hard Rock Hotel, San Diego, California

Chair: Tayyaba Hasan PhD Massachusetts General Hospital Harvard Medical School Boston, MA, USA	Organizing Committee:	David Mitchell, PhD Univ. Texas, USA	Theresa Busch, PhD Univ. Pennsylvania, USA	Jean Cadet, PhD CEA, France
		Wolfgang Gaertner, PhD Max-Planck-Institute, Germany	Alexander Greer, PhD CUNY-BC, USA	Yu-Ying He, PhD Univ. Chicago, USA
		Edward Maytin, MD, PhD Cleveland Clinic, USA	David Kessel, PhD Wayne State, USA	Jonathan Lovell, PhD Univ. Buffalo, USA
		Theo Theodossiou, PhD The Radium Hospital, Norway	Patrycja N-Sliwiska, PhD EPFL, Switzerland	Imran Rizvi, PhD Harvard Univ., USA
		Dr. rer. nat. Rüdiger Greinert, Elbekliniken Buxtehude, Germany	Henry Lim, MD Henry Ford Health System, USA	John Streicher, MS EPA, USA
		Pål Selbo, PhD The Radium Hospital, Norway		



**Enjoy San Diego Attractions: Gaslight District, Sea
Food, SeaWorld and the Famous San Diego Zoo**

Topics include

- Light and Biology in Extreme Environments
- Magnetic Field Effects and Photochemistry
- Angiogenesis and Vascular Biology
- Artificial Tanning: Risks and Benefits
- Cellular Modulation in Photobiology
- Enabling Photobiology in the Dark
- DNA Damage and Repair
- Optomechanical Effects
- Stem Cell Photobiology
- Photodynamic Therapy
- Spiders, Silk and Light
- Nanotechnology
- UV-epigenetics
- Tumor models
- Optogenetics

Networking Events

- Mentoring Lunch
- Posters and Prizes
- ASP-ESP Symposium
- San Diego Tours and outing
- NIH Grant Writing Workshop
- Associate Member Travel Awards
- Awards, Banquet, Reception