

PASPCR

April 2013
Vol. 21 Number 1

Newsletter

The **PASPCR Newsletter** is published three times a year and is intended to serve as a regular means of communication for the members of our Society. The PASPCR Newsletter is distributed via e-mail, in pdf format, on the first of April, August and December and it will continue to be posted on the web-site of the Society.

Preparations for 18th PASPCR Meeting, spear-headed by Dr. Vijayasradhi Setaluri, are progressing well. The meeting will be held in Madison, Wisconsin, from September 8th to September 11th, 2013. Further information on the meeting can be found on page 6 of this newsletter.

In this issue, we continue the “*Laboratory Updates*” section with a column by Dr. John D’Orazio, and the “*Let me Introduce...*” section with a column by Dr. Marco d’Ischia. We also continue the “*Clinical Insights*” section with a column by Dr. Stanca Birlea and Dr. David Norris. Back in this number is the section “*Hot off the Presses*” that hosts columns by Drs. Feng Liu and Tatiana Krasieva.

We hope you enjoy this issue. We encourage you to send us your comments at our email address paspcr.newsletters@gmail.com. Let us know what you would like to see in the letters, suggest sections you think would be useful to include, and recommend any changes that you would like to see.

We also encourage you to let us know about meetings that you think would be of interest to members of the Society. If you attend a scientific meeting at which you heard about work which you think will be of interest to the membership of the PASPCR, please write a few paragraphs summarizing what was presented and share it with us. If you know of training courses that would be of interest to the PASPCR members, please let us know and we will add them to a new section in our Calendar of Events.

Also, keep us updated on any “*Members in the News*” so we can spread the word of your successes.

This is **your Newsletter**, and we depend upon you to help us ensure it best serves the Society’s needs. We look forward to hearing your ideas and suggestions and to continue working together to compile the Newsletters for our Society.

The PASPCR Newsletter Editorial Team would like to thank all our contributors for their columns submitted to us for inclusion in the letters.

PASPCR Newsletter Editorial Team

In this Issue

PASPCR OFFICERS	2
CALENDAR OF EVENTS	2
CORPORATE SPONSORS	3
PASPCR PRESIDENT’S CORNER	3
LETTER FROM THE PASPCR SECRETARY/TREASURER	4
18 th PASPCR MEETING	6
Letter from the Organizer, Dr. Vijayasradhi Setaluri	7
PCMR JOURNAL CORNER	8
PCMR Journal Recent PubCast	
<i>Dr. Arup Indra’s Laboratory</i>	
PIGMENTATION COMMUNITY CONNECTIONS	10
LABORATORY UPDATES	11
<i>by Dr. John D’Orazio</i>	
LET ME INTRODUCE...	13
<i>by Dr. Marco d’Ischia</i>	
CLINICAL INSIGHTS	16
<i>by Dr. Stanca Birlea and Dr. David Norris</i>	
HOT OFF THE PRESSES	19
<i>by Dr. Feng Liu</i>	19
<i>by Dr. Tatiana Krasieva</i>	20
MEMBERS IN THE NEWS	22
Le Poole <i>et al.</i> , Mutant HSP70 Reverses Autoimmune	
Depigmentation in Vitiligo – <i>Sci. Transl. Med</i>	
POSITION AVAILABLE	22
Postdoctoral Fellowship – University of Cincinnati	22
2013 PASPCR MEMBERSHIP LIST	23

The PASPCR Web-Site can be found at:
<http://www.paspcr.org>

**The PanAmerican Society for
Pigment Cell Research**

C/O Andrzej T. Slominski, M.D., Ph.D.
University of Tennessee Health Science Center
Department of Pathology and Laboratory Medicine,
930 Madison Avenue, Room 525 (Clinical Office),
Memphis, TN 38163, U.S.A.

Officers:

Greg Barsh

President

Caroline Le Poole

President-elect

Andrzej Slominski

Secretary/Treasurer

Council Members:

Gertrude-Emilia Costin (2012-2014)
Thomas Hornyak (2013-2015)
Lidia Kos (2013-2015)
Deborah Lang (2011-2013)
Sancy Leachman (2012-2014)
John Pawelek (2011-2013)
Glynis Scott (2012-2014)
Vijayaradh Setaluri (2011-2013)
Julio Valencia (2013-2015)

IFPCS Representatives:

Andrzej Slominski (*Secretary*)
Greg Barsh (*Council Member*)
Frank Meyskens (*Council Member*)

CALENDAR OF EVENTS

2013

The International Investigative Dermatology (IID) Meeting

Date and place: May 8-11, Edinburgh, Scotland, UK
Web-site: <http://www.iid2013.org/welcome/>

2013

The 18th ESPCR Meeting

Date and place: September 9-12, Lisbon, PORTUGAL
Web-site: <http://www.espcr.org/ESPCR2013/>

2013

The Pigment Cell Development Workshop

Date and place: May 6-8, Edinburgh, UK
Web-site: <http://devbio.hgu.mrc.ac.uk>

2013

The 1st IID Satellite Symposium on Dermatoendocrinology

Date and place: May 7, Edinburgh, UK
Web-site: http://iid2013.org/scientific_program/

2013

The ASPCR-ASDR Meeting

Date and place: May 17-19, Sydney, AUSTRALIA
Web-site: <http://www.aspcr.org/>

2013

The 18th PASPCR Meeting

Date and place: September 8-11, Madison, WI, USA
Web-site: www.paspcr.org/

2013

The Annual Meeting of American Society for Cell Biology

Date and place: December 14-18, New Orleans, LA, USA
Web-site: <http://www.ascb.org/>

2014

The 22nd IPCC

Date and place: September 4-7, Singapore, SINGAPORE
Web-site: <http://www.ipcc2014.org/>

The *PASPCR Newsletter* is published three times a year (April, August and December) by the PanAmerican Society for Pigment Cell Research. **All views are those of the authors.** For further information or to submit articles, please use the e-mail address paspcr.newsletters@gmail.com.

Publication Committee

Gertrude-Emilia Costin, Ph.D., M.B.A.

Editor

Institute for In Vitro Sciences, Inc. (IIVS)
30 W. Watkins Mill Road #100
Gaithersburg, MD 20878, U.S.A.
(301) 947-6524
ecostin@iivs.org

Prashiela Manga, Ph.D.

Associate Editor

New York University School of Medicine
Department of Dermatology
Smilow Research Center
522 First Avenue, Room 401
New York, NY 10016, U.S.A.
(212) 263-9086
prashiela.manga@nyumc.org

William S. Oetting, Ph.D.

University of Minnesota
Department of Medicine - Genetics
MMC 485; 4-12 Moos Tower
515 Delaware Street S.E.
Minneapolis, MN 55455, U.S.A.
(612) 624-1139
oetti001@umn.edu

Andrzej T. Slominski, M.D., Ph.D.

University of Tennessee Health Science Center
Department of Pathology and Laboratory Medicine
930 Madison Avenue, Room 525 (Clinical Office)
Memphis, TN 38163, U.S.A.
(901) 448-3741
aslominski@uthsc.edu

CORPORATE SPONSORS

by Dr. Andrzej Slominski

The PASPCR would like to acknowledge and thank our Sponsors. The list below reflects contributions made during the year of 2012. In the past, financial gifts from our Sponsors have allowed our Society to increase benefits to the membership far out of proportion to the actual dues collected from members. We gratefully acknowledge the contributions for the 17th PASPCR Meeting made through PASPCR as follows (in alphabetical order):

All Resort Transportation

Department of Dermatology at the University of Utah

Huntsman Cancer Institute at the University of Utah

Johnson & Johnson Consumer Companies (Aaron B. Lerner Lecture)

Merck

Morphotek

Myriad Genetics

Prometheus

St. Regis Hotel

- // -

PASPCR PRESIDENT'S CORNER

Spring is here. Or, at least it was, a few weeks ago. Seduced by a couple of warm weekends in early March, and held captive by the school calendar of a 15 year-old daughter, earlier this week we joined the yearly migration that is something of a tradition for Tennessee valley residents, driving 300 miles South to the Gulf Coast, for what was billed as a relaxing time at “the beach”. Pigmentary variation was everywhere, from pastel colors of the houses and the sunsets to fluorescent greens and blues of the great egrets’ breeding colors. But the ambient temperature was a balmy 45 degrees (Fahrenheit), and no amount of sunscreen or Jimmy Buffett music could ameliorate the sense of communal betrayal...what happened to Spring?

A sense of betrayal also underlies several recent science-related, societal, and personal events, and I will take this newsletter opportunity to share my reaction to some of those experiences, interspersed with a few bright notes. First, from the perspective of a citizen scientist, the only thing worse than the current sorry state of US science funding is the sorrier state of our US politicians, who are so dysfunctional that they barely managed a continuing resolution to keep the doors open—at the post office, the Washington monument, and, just barely, the NIH—earlier this week. What should we do? (a) Wait until 2014, and hope that the House turns over; (b) Demand that our elected representatives (regardless of party affiliation) stop seeing compromise as a dirty word; (c) Apply for postdoc positions in Switzerland. Thirty years ago, the third option might not have been in jest, but today, I will embrace both (a) and (b), and encourage Society members to do the same. Bright note: in the midst of 7% pay

lines and mandated budget reductions for funded grants, our own Vijay Setaluri has managed to get a terrific score for his R13 application to support our own meeting this Fall. Glückwünsche, Vijay!

Our 2013 meeting in Madison, Wisconsin, also provides an appropriate segue for another cloud with silver linings. One of several topics considered by the organizing committee over the last few months has to do with how, when, and why the abstracts and the proceedings of the meetings will be publicized, distributed, and archived. This is a perfect opportunity for collaboration between a scientific society and a science publisher, but science publishing is also a business, which sets an unfortunate stage for a potential betrayal of motivation. Bright note: the relationship between the IFPCS and Wiley has served both parties well, but will only continue to do so as long as the interests of the Societies are represented by a strong and thoughtful leader. As a member of the IFPCS council, I have been party (and occasionally contributed) to extensive discussions over the last few months in which the interests of the Societies are ably represented by President Picardo. Continuate così nobile, Mauro!

I will close on a personal and sad note...the unexpected loss of a dear friend earlier this year. David Cox, 66 years old, died suddenly from apparent heart disease on January 21, 2013. Dave and I followed somewhat similar paths, entranced by the awesome power of genetics, never sure whether we were physicians or scientists, and sharing a love for music, nature, and our families, who are related by choice and by spirit. Betrayed in this case by time (not enough of it), Dave's passing was a reminder that there are bright notes everywhere; we just need to look. Dave's passion for genetics and medicine is easy to see in an informal interview that is part of the Cold Spring Harbor Oral History collection: <http://library.cshl.edu/oralhistory/interview/genome-research/involvement-genomics/cox-involvement-in-genomics/>.

Greg Barsh, M.D., Ph.D.
PASPCR President



- // -

LETTER FROM THE PASPCR SECRETARY/TREASURER

Dear PASPCR members,

Preparations for the XVIIIth PASPCR Conference in Madison, Wisconsin are under way under outstanding leadership by Dr. Vijay Setaluri and members of the Organizing Committees. In my opinion the program will attract many investigators from different fields. The key note speaker is Dr. Hector F. De Luca who contributed enormously to the field of vitamin D. His name was submitted at least twice to be considered by Nobel Prize Committee. Therefore, we would like to congratulate Vijay for inviting Dr. De Luca to this important conference. The team in Wisconsin is very well organized, and is already securing the proper outside financial support. The conference grant submitted to the NIH

got an outstanding score and will likely be funded. I also obtained a note from Johnson & Johnson that the application for the grant to support A.B. Lerner lectureship will be awarded. Therefore, please reserve following dates: September 8-11 to attend our meeting.

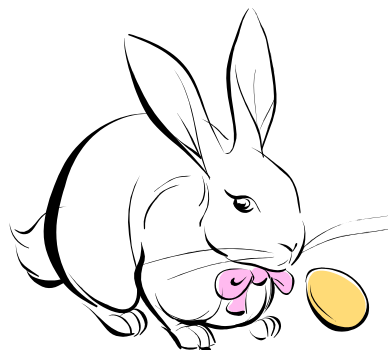
Concerning travel awards, there are two conflicting opinions. One presented by me is that the applicant should be a member of the PASPCR in good standing when submitting the application. This is the continuation of the previous policy realized since the meeting in Memphis. Second, voiced by the President and President-elect is that non-members can also apply for the travel grant on the same conditions as the members in good standing. These issues will be discussed and decided by the PASPCR Council shortly. I believe, however, that the priority in awarding grants to student members of the Society and requirement of being a first and presenting author will be maintained. If you have any opinion on this matter you can voice it prior the decisions are made.

I am also pleased to announce that financially we are very strong, which is good news for relatively small Society, and therefore, we are not changing the dues which remain the same since the Memphis meeting. Also, we subsidize students, since their dues only partially cover costs of electronic subscription. If anybody experiences problems accessing the journal (it has to be done through the IFPC website) or did not receive the printed journal for which she or he has paid, please let me know. I will refer such matter to the IFPC.

I would also like to provide some statistics on the membership. The total number of PASPCR members in good standing is 93, which includes 19 student members and 2 members of Japanese and 1 member of the European Societies. This is approximately 20-25% decrease in membership. Therefore, please recruit more investigators into the Society or ask previous members to renew. The bigger we are the stronger we are and the higher our impact on science and NIH funding is.

I thank you again for your support of our Society and I wish you Happy Easter and Happy Passover!

Andrzej Slominski, MD, PhD
Professor of Pathology and Medicine
Secretary/Treasurer of the PASCPR and Secretary of the IFPCS



18th PASPCR MEETING – MADISON, WI, USA



Advances in Melanocyte and Melanoma Biology

Symposia Topics

Cell & Molecular Biology of Normal & Malignant Melanocytes
UV light: Role in Melanin Pigmentation and Melanoma
Melanocyte Development & Melanoma Cancer Stem Cells
Immune Responses to Normal & Malignant Melanocytes
Bench-to-Bedside & Back

Keynote Speaker

Hector F. DeLuca, Ph.D., University of Wisconsin

For more information on PASPCR, please visit
our website at:

<http://paspcr.med.umn.edu/>

The conference site is currently under construction, please
check back at a later date for additional information.

18th Meeting of the PanAmerican Society for Pigment Cell Research (PASPCR)

September 8-11, 2013
University of Wisconsin-Madison
Madison, WI, USA



National Committee:

Greg Barsh, M.D., Ph.D.
President

Andrzej Slominski, M.D., Ph.D.
Secretary/Treasurer

Caroline Le Poole, Ph.D.
President-elect

Hasan Mukhtar, Ph.D.
Member

Local Organizing Committee:

Vijayaradhi Setaluri, Ph.D.
Chair

Mark Albertini, M.D.
Co-Chair

Nihal Ahmad, Ph.D.

Murray Brilliant, Ph.D.

B. Jack Longley, M.D.

Vladimir Spiegelman, M.D., Ph.D.



DEPARTMENT OF
DERMATOLOGY



Dear Pigment Cell Colleagues and Friends,

The 18th Annual Meeting of the PASPCR will be held September 8-11, 2013 on the campus of University of Wisconsin-Madison, Madison, WI with active support and sponsorship of the UW Department of Dermatology and the UW Carbone Comprehensive Cancer Center.

The overarching theme of this year's meeting is "**Advances in Melanocyte and Melanoma Biology**". Since the molecular cloning of mammalian tyrosinase over 25 years ago and identification of MITF, the master regulator of melanocyte two decades ago, the field of pigment cell biology has experienced an explosion of knowledge and continues to attract many talented researchers with a wide range of expertise. This year's meeting is designed to bring together senior and young researchers to highlight the latest advances in 5 selected areas 1) basic cell & molecular biology, 2) melanocyte development, 3) UV induced pigmentary changes, 4) immune response to melanocyte antigens and 5) opportunities and challenges in translating these advances to benefit patients with pigmentary disorders with special emphasis on vitiligo and cutaneous melanoma.

The keynote lecture will be delivered by Dr. Hector DeLuca, a pioneer in Vitamin D research. The list of invited speakers include: Dr. David Fisher, Dr. Ze'ev Ronai, Dr. Ruth Halaban, Dr. Jeff Sosman, Dr. Elsa Quintana, Dr. Jose Guvera-Patiño, and Dr. Catherine van Raamsdonk.

Objectives of this year's program are to:

- Review the latest developments in basic and clinical investigations in pigmentary biology and disease
- Identify areas for future collaborative and interdisciplinary research that focus on improving human health with regard to melanoma, vitiligo and other pigmentary disorders
- Facilitate collaborative relationships among researchers with diverse expertise
- Identify the opportunities and address the challenges in translating the basic discoveries to benefit patients with pigmentation diseases such as cutaneous melanoma and vitiligo

Distinctive features of this year's program include:

- A dedicated session to highlight advances and current challenges in bench-to-bedside translation
- Opportunities for young investigators to meet with experts in an informal and exclusive setting to discuss and understand opportunities and challenges in pigment cell research
- Special travel grants to support young investigators
- Publication of the program, abstracts, and meeting report online and/or by Pigment Cell and Melanoma
- Research

The University of Wisconsin-Madison was founded in 1848, and has long been recognized as one of America's great universities. Located near the Wisconsin state capitol building, its campus spans 936 acres along the southern shore of Lake Mendota. A public, land-grant institution, UW-Madison was ranked 4th among all higher education institutions in the United States for research and development in 2011.

The Fluno Center, the venue of the meeting is centrally located on the UW-Madison campus and offers superb views of the surrounding university and city. The Fluno Center combines collaborative classroom technology with the ambiance of a comfortable, relaxed residential setting. The interior captures the simplicity and elegance of the Arts and Crafts era, featuring prairie style furnishings and original lithographs of designs by Frank Lloyd Wright, an American architect with strong roots in the Madison area, recognized as "the greatest American architect of all time."

The local organizing committee looks forward to welcome you to Madison and your active participation in the conference.

Vijayasradhi Setaluri, PhD
Professor of Dermatology, University of Wisconsin-Madison

Local organizing committee:

Vijayasradhi Setaluri, PhD, (Chair) Professor of Dermatology, University of Wisconsin-Madison

Mark Albertini, MD, (Co-chair) Associate Professor of Medicine, University of Wisconsin-Madison

Murray Brilliant, PhD, Senior Scientist, Marshfield Clinic Research Foundation

Nihal Ahmad, PhD, Professor of Dermatology, University of Wisconsin-Madison

Vladimir Spiegelman, MD, PhD, Professor of Dermatology, University of Wisconsin-Madison

B. Jack Longley, MD, Professor of Dermatology, University of Wisconsin-Madison

KEY DATES:

Abstract Submission & Early Registration: **July 1, 2013**

For further details, please visit: **www.PASPCR.org**

- // -

PCMR JOURNAL CORNER

PCMR Journal Recent PubCast

A new PubCast has been recently released for Pigment Cell & Melanoma Research (**PCMR**), the scientific journal associated to IFPCS and SMR. This video refers to the work of Dr. Arup K. Indra's Laboratory (Department of Pharmaceutical Sciences, Oregon State University, Corvallis, OR, USA) on "Endothelin-1 is a transcriptional target of p53 in epidermal keratinocytes and regulates ultraviolet-induced melanocyte homeostasis" by Stephen Hyter, Daniel J. Coleman, Gitali Ganguli-Indra, Gary F. Merrill, Steven Ma, Masashi Yanagisawa, Arup K. Indra – Pigment Cell & Melanoma Research 26(2), 247-258 (2013). This PubCast (video) is available at: <http://www.scivee.tv/journalnode/56891>.

PIGMENT CELL & MELANOMA

Research

THE OFFICIAL JOURNAL OF INTERNATIONAL FEDERATION OF
PIGMENT CELL-SOCIETIES • SOCIETY FOR MELANOMA RESEARCH

New Editors for 2013:

Heinz Arnheiter, NIH, USA

Marcus Bosenberg, Yale University, USA

Robert Kelsh, University of Bath, UK

New High
Impact
Factor®

5.059

OnlineOpen

Pigment Cell & Melanoma Research now offers Open Access publication

An optional open access model, OnlineOpen, is available to authors who wish to make their article available to non-subscribers on publication, or whose funding agency requires grantees to archive the final version of their article.

For more information on Online Open visit:

wileyonlinelibrary.com/onlineopen



Find us on Facebook: www.facebook.com/PCMRe

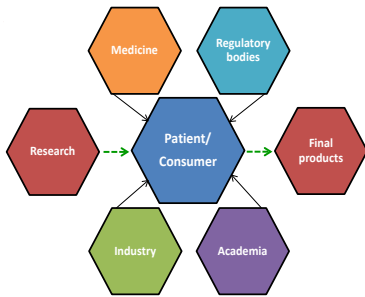
See our website for more details: www.pigment.org

 WILEY-BLACKWELL

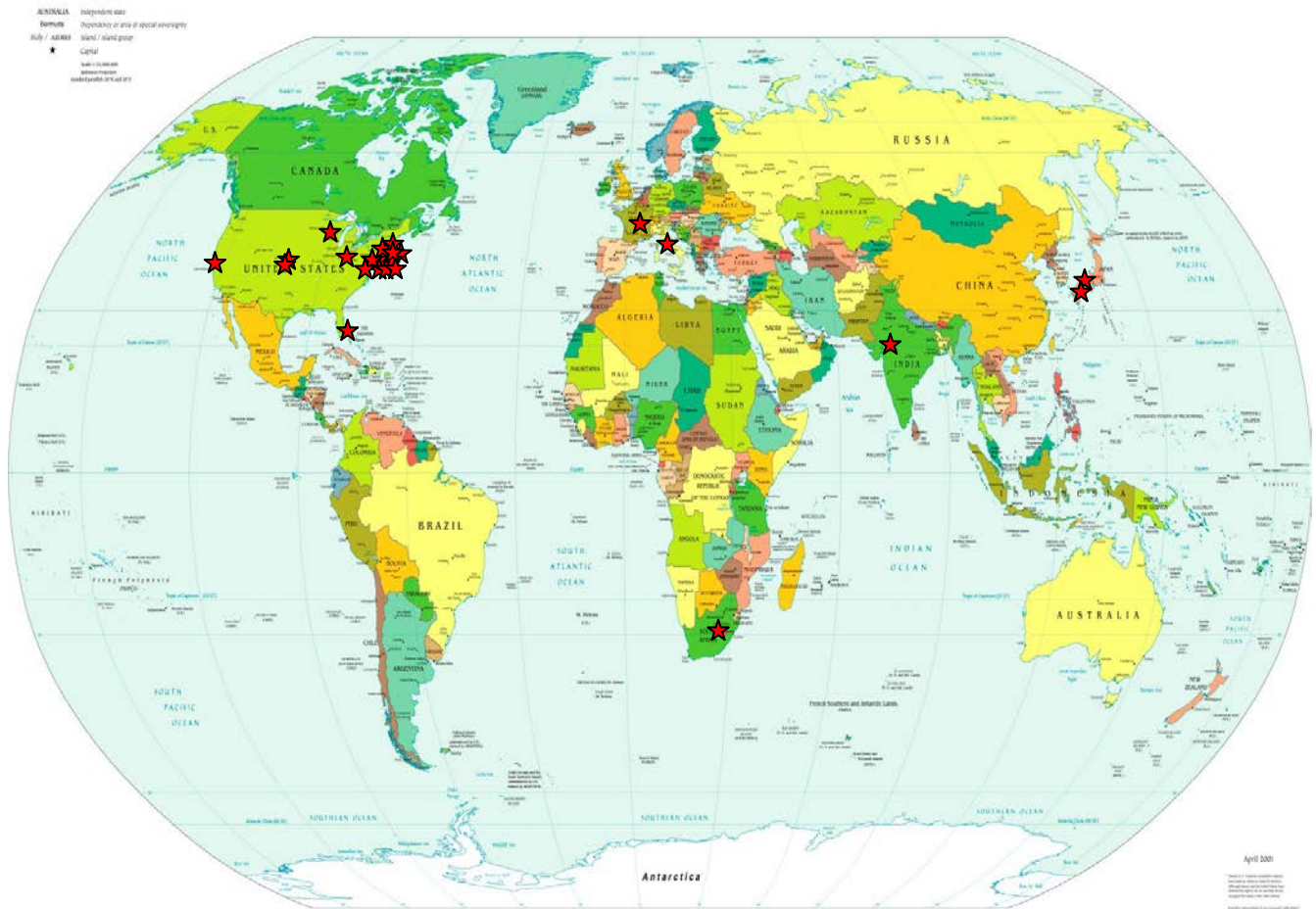
PIGMENTATION COMMUNITY CONNECTIONS

In this issue, we continue the “*Laboratory Updates*” with a column by Dr. John D’Orazio, the “*Let me Introduce...*” section with a column by Dr. Marco D’Ischia, and the “*Clinical Insights*” with a column by Dr. Stanca Birlea and Dr. David Norris. We hope that you will be inspired to take the opportunity to fill us in on what is happening in your lab or company. Volunteers would be greatly appreciated, just email us at paspcr.newsletters@gmail.com.

This initiative is part of our effort to keep the Pigmentation community connected and to emphasize the importance of collaboration and communication between groups. We will keep adding stars on our world map below each time you contribute a column about your newest research projects. So, let’s go on a global research adventure!



Political Map of the World, April 2001



LABORATORY UPDATES

by Dr. John D'Orazio

Over 70,000 people are now diagnosed and 9,000 die from melanoma in the United States annually. Despite the wonderful advances in targeted therapy and immunotherapy realized in melanoma treatment over the last several years, the long-term prognosis for patients with advanced-stage melanoma remains pessimistic. Prompted by these dire statistics, my lab at the University of Kentucky Markey Cancer Center focuses on how skin interacts with the ultraviolet radiation found in sunlight. Our overall goal is to develop safe approaches to prevent melanoma development in high-risk populations and to minimize the deleterious consequences of UV exposure to the skin. Of particular interest to us is the melanocortin-1 receptor (MC1R) allele, which has emerged as a major genetic risk factor of melanoma and UV sensitivity. The MC1R gene encodes a G_s-protein coupled receptor expressed on the surface of the melanocytes that relays survival and differentiation signals to melanocytes upon interaction with its cognate ligand alpha melanocyte stimulating hormone (α -MSH) through activation of adenylyl cyclase and generation of the second messenger cAMP. The MC1R gene is highly polymorphic with variant alleles linked with red hair, fair skin, poor UV tanning, and elevated melanoma risk (Valverde, Healy et al. 1996; Abdel-Malek, Suzuki et al. 1999; Landi, Bauer et al. 2006). MC1R activation after UV exposure results in adaptive melanization (tanning) to provide enhanced protection against cutaneous UV penetration and damage. Defective MC1R signaling results in inadequate melanization of the skin, which allows UV-induced DNA changes to accumulate that can lead to mutations and carcinogenesis. In humans, loss-of-function MC1R polymorphisms are associated with UV sensitivity and a melanoma-prone phenotype. When MC1R signaling is defective, melanocytes preferentially produce pheomelanin rather than eumelanin species. Pheomelanin is a much poorer blocker of UV photons and may actually contribute to

oxidative damage and mutagenesis, as has recently been suggested by data from Devarati Mitra and coworkers in the laboratory of my mentor, David Fisher (Mitra, Luo et al. 2012).

In addition to its role in skin melanization, MC1R may influence melanoma development by non-pigmentary pathways as well (Robinson, Dixon et al. 2010). Building on the work of many laboratories, we are attempting to determine molecular links between MC1R signaling and genome maintenance pathways in melanocytes. The last decade has seen compelling evidence of MC1R-cAMP-mediated signaling in promoting the early repair response to UV-induced DNA damage (Hauser, Kadarko et al. 2006; Song, Mosby et al. 2009; Kadarko, Chen et al. 2012; Wong, Ainger et al. 2012). Such a DNA repair function for MC1R was initially suggested by the observation that RHC variants had a reduced ability to remove UV-induced photolesions independent of the cellular melanin content. We and others have observed an impaired UV-induced DNA damage response in the setting of defective MC1R function. Of particular interest, MC1R agonists and cAMP stimulants enhance melanocytic nucleotide excision repair (NER), a major pathway responsible for removing UV-induced DNA damage and protecting cells from UV-induced malignant degeneration. Pharmacologic manipulation of the MC1R signaling pathway therefore holds great promise as a melanoma-preventive strategy. Determining the molecular mechanisms linking MC1R signaling and NER function remains a critically unanswered question, one of which our lab is currently investigating. My postdoctoral work in David Fisher's lab found that topical application of the adenylyl cyclase activating drug forskolin restored melanotic pigmentation in an animal model of the MC1R-defective fair-skinned human and that this "sunless tanning" was potentially protective against UV damage and carcinogenesis in the skin (D'Orazio, Nobuhisa et al. 2006). We rely on this animal model to study

the many effects of cAMP stimulation in the skin, including a robust acceleration of the skin's ability to clear mutagenic UV photolesions.

Another area of interest for the lab is determining the contribution of epidermal thickness in aiding protection against UV-associated carcinogenesis. Recently, we utilized a humanized skin mouse model that maintains interfollicular epidermal melanocytes, and identified that activation of adenylyl cyclase was associated with expansion of epidermal thickness irrespective of melanization or the presence of epidermal melanocytes. Interestingly, cAMP-directed epidermal thickening was mediated through increased keratinocyte proliferation, possibly through secreted factor(s) including KGF from cutaneous fibroblasts. Even in the absence of pigmentation, the observed epidermal thickening significantly diminished the amount of UV-A and UV-B that passed through whole skin and reduced the amount of UV-B-associated

epidermal sunburn cells, suggesting that this strategy might afford some UV protection even in amelanotic (albino) individuals (Scott, Christian et al. 2012).

My lab is privileged to be part of an exciting and dynamic "MC1R community", which together has provided new insights into the mechanistic relationships between UV exposure and skin cancer. However, the overall picture of MC1R's influence on carcinogenesis is not yet complete, and we expect that future studies of the MC1R-cAMP pathway may yet hold more surprises. In particular, we feel that pharmacologic manipulation of cAMP levels in the skin (Abdel-Malek, Ruwe et al. 2009; Passeron, Namiki et al. 2009; Abdel-Malek 2010; Kadarko, Chen et al. 2012) represents a promising and novel approach to alter UV sensitivity and cancer risk in MC1R-deficient and melanoma susceptible individuals.



John D'Orazio's lab members (L to R):

John D'Orazio, Alexandra Amaro-Ortiz, Perry Christian, Christina Wicker and Stuart Jarrett.

REFERENCES

Abdel-Malek, Z., I. Suzuki, et al. (1999). "The melanocortin-1 receptor and human pigmentation." *Ann N Y Acad Sci* 885: 117-133.

Abdel-Malek, Z. A., A. Ruwe, et al. (2009). "alpha-MSH tripeptide analogs activate the melanocortin 1 receptor and reduce UV-induced DNA damage in human melanocytes." *Pigment Cell Melanoma Res* 22(5): 635-644.

Abdel-Malek, Z. A. (2010). "Development of alpha-melanocortin analogs for melanoma prevention and targeting." *Adv Exp Med Biol* 681: 126-132.

D'Orazio, J. A., T. Nobuhisa, et al. (2006). "Topical drug rescue strategy and skin protection based on the role of Mc1r in UV-induced tanning." *Nature* 443(7109): 340-344.

Hauser, J. E., A. L. Kadarko, et al. (2006). "Melanin content and MC1R function independently affect UVR-induced DNA damage in cultured human melanocytes." *Pigment Cell Res* 19(4): 303-314.

Kadarko, A. L., J. Chen, et al. (2012). "Alpha-melanocyte-stimulating hormone suppresses oxidative

stress through a p53-mediated signaling pathway in human melanocytes." *Mol Cancer Res* **10**(6): 778-786.

Landi, M. T., J. Bauer, et al. (2006). "MC1R Germline Variants Confer Risk for BRAF-Mutant Melanoma." *Science* **313**(5786): 521-522.

Mitra, D., X. Luo, et al. (2012). "An ultraviolet-radiation-independent pathway to melanoma carcinogenesis in the red hair/fair skin background." *Nature* **491**(7424): 449-453.

Passeron, T., T. Namiki, et al. (2009). "Forskolin protects keratinocytes from UVB-induced apoptosis and increases DNA repair independent of its effects on melanogenesis." *J Invest Dermatol* **129**(1): 162-166.

Robinson, S., S. Dixon, et al. (2010). "Protection against UVR involves MC1R-mediated non-pigmentary and pigmentary mechanisms in vivo." *J Invest Dermatol* **130**(7): 1904-1913.

Scott, T. L., P. A. Christian, et al. (2012). "Pigment-independent cAMP-mediated epidermal thickening protects against cutaneous UV injury by keratinocyte proliferation." *Exp Dermatol* **21**(10): 771-777.

Song, X., N. Mosby, et al. (2009). "alpha-MSH activates immediate defense responses to UV-induced oxidative stress in human melanocytes." *Pigment Cell Melanoma Res* **22**(6): 809-818.

Valverde, P., E. Healy, et al. (1996). "The Asp84Glu variant of the melanocortin 1 receptor (MC1R) is associated with melanoma." *Hum Mol Genet* **5**(10): 1663-1666.

Wong, S. S., S. A. Ainger, et al. (2012). "MC1R variant allele effects on UVR-induced phosphorylation of p38, p53, and DDB2 repair protein responses in melanocytic cells in culture." *J Invest Dermatol* **132**(5): 1452-1461.

Contact:

John D'Orazio, M.D., Ph.D.

Associate Professor

University of Kentucky College of Medicine

The Markey Cancer Center Combs Research Bldg. Rm. 204

800 Rose Street, Lexington, KY 40536-0096

Phone: (859) 323-6238

Fax: (859) 257-8940

Email: jdorazio@uky.edu

- // -

LET ME INTRODUCE...

by Dr. Marco d'Ischia

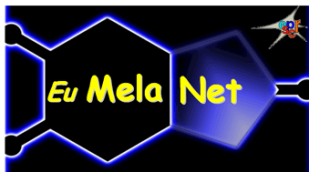
The EuMelaNet Group: Promoting Interdisciplinary and Translational Research on Melanins and Melanogenesis.

Melanins to the fore in biomedical and materials sciences

No doubt, pigment cells are endowed with unique and fascinating properties which make them an unrivalled research field to make new exciting discoveries and foster new projects that bring together investigators from diverse disciplines to study important biomedical problems. There is likewise no doubt that much of the pigment cell uniqueness is due to the pigment itself as a most distinguishing trait that has attracted the attention of scientists and clinicians since time immemorial. However, if we take a retrospective look at the way pigment cell research has evolved throughout the past decades, we will notice that the focus has been gradually shifted off from the pigment. Whereas early meetings and symposia used to feature scientific programs largely devoted to melanin structure, properties and biological functions, as rooted in the pathway of melanogenesis, in more recent years these themes have been somewhat abandoned, leaving a number of fundamental issues still unsettled. Paradoxically, an opposite trend has been apparent outside the pigment cell community, where melanins and

melanogenesis have been increasingly appreciated as a source of novel research opportunities. The burst of interest in polydopamine as biocompatible, highly adhesive and multifunctional biopolymer is a paradigmatic example of how melanin-related materials may provide remarkable solutions to scientific and technological problems, being amenable to an extraordinary variety of applications. So, why not stimulate the interdisciplinary study of melanins as a source of inspiration for human well-being, from health to technology?

The birth and mission of the EuMelaNet group



Prompted by these considerations, during the ESPCR meeting in Muenster in 2009 a number of colleagues and I decided to take a concrete and effective action not only to promote a renaissance of basic melanin research within our Societies but also, and especially, to raise the attention of scientific communities and industrial companies that operate outside of, or at the interface with, pigment cell biology. Starting from informal discussions, the idea of a special interest group pursuing these goals rapidly materialized into the establishment of EuMelaNet, thanks also to the strong and encouraging support of Lionel Larue, Alain Taïeb, Lluís Montoliu, Mauro Picardo and all the members of the ESPCR Council. The name of the group was selected in order to underscore both its European birthplace and the unexplored potential of eumelanins for application. The stated mission of EuMelaNet is detailed in the website (www.espcr.org/eumelanet/) and is summarized in Figure 1.

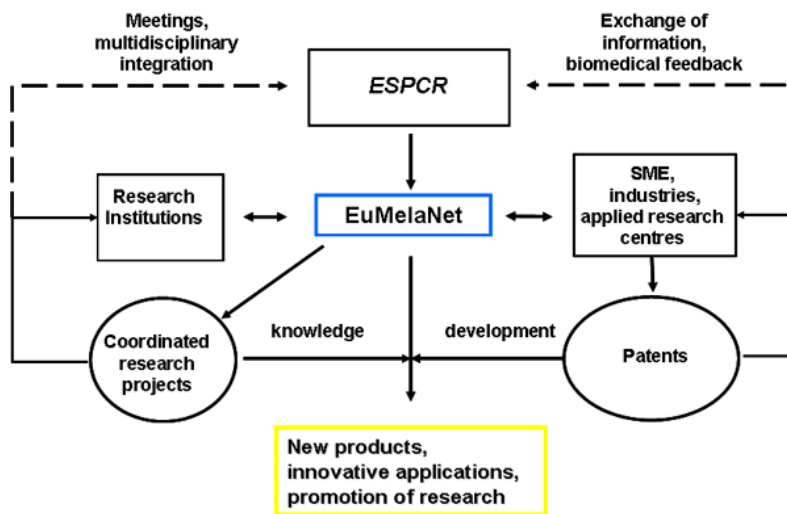


Figure 1

The group seeks to promote basic research on melanins as multifunctional biomaterials; to bridge the gaps between basic and applied research, to ‘translate’ fundamental research results into applications; to ensure coordination of research and to identify new opportunities to develop new melanin-based technologies; to promote the integration of multidisciplinary research teams aimed at technology-oriented research.

To pursue these goals, several activities will be envisaged which include the organization of meetings and colloquia, standardization of products and methods, supply of chemicals and standards, training courses for industry personnel, and coordination of research programs.

Current activities

The first official meeting of the EuMelaNet Special Interest group took place during the XXI International Pigment Cell Conference held in Bordeaux in 2011, on the occasion of Concurrent Session 5 chaired by Marco d'Ischia, José-Carlos García-Borrón and Shosuke Ito. This session was entitled "Methods in Melanin Research" and was formatted as a round table centered around the launching project of the EuMelaNet group, that is, the definition of a set of recommended protocols and procedures to be followed for studies of melanins and melanogenesis. Eventually it was agreed that the presentations debated at CS5 were worthy of further assessment and elaboration by the group to generate a consensus paper on standardization of methods, which should be directed to guide pigment cell researchers into the experimental details of melanin-relating protocols with an easy-to-do approach for non-chemists. A draft of the paper is now ready and at the point of being submitted.

In line with the general mission of promoting melanin research at interdisciplinary levels, members of the EuMelaNet special interest group and their colleagues have been actively participating in various meetings directed to technological and biomedical applications.

Future perspectives

What's next? Certainly, as mentioned before, one of the most promising applications of melanin-type materials is in the field of organoelectronics. The integration of biopolymers into hybrid electronics is one of the emerging issues in view of the realization of fully bio-compatible devices. A highly attractive field of application of melanins is also in relation to the development of biological interfaces, a most intriguing area of research encompassing biology, biotechnology, diagnostics, and medicine, and involving (bio)chemists, physical chemists, applied physicists, analytical chemists and bioengineers. The current quest for biocompatible and biodegradable materials with advanced mechanical and electrical capabilities would prompt exploitation of melanins as the centerpiece for medical devices, for example in electronically active absorbable implants. Photoprotection and radioprotection are also important areas where melanins may be fruitfully utilized. In this rapidly changing scenario of interdisciplinary and multidisciplinary research, the EuMelaNet group may play an important role as a liaison between scientific communities and companies, in providing connections, the basic know-how and guidelines to applied scientists.

The way toward a full appreciation of melanins' potential for applications in biomedicine and technology is still long. It is hoped however that the commitment of the EuMelaNet members, with the encouraging support of the ESPCR and sister Societies like the PanAmerican Society, will soon materialize into novel projects of high technological and biomedical impact. Synergism with other scientific and technologically-oriented communities will be very important. Pursuit of the EuMelaNet mission will be useful not only for the advancement of technology but also for a reappraisal of the biological roles and functions of melanins.

We therefore invite all interested members of the Pigment Cell Societies to join EuMelaNet, exchange views and ideas, promote new initiatives, and contribute to exploit the immense potential of melanins as safe functional biomaterials for technology and health.

Contact:

Professor Marco d'Ischia

Scientific Coordinator

EuMelaNet

<http://www.espcr.org/eumelanet/>

CLINICAL INSIGHTS

by Dr. Stanca Birlea, M.D., Ph.D. and Dr. David Norris, M.D.

IDIOPATHIC GUTTATE HYPOMELANOSYS - A COMMON ESTHETIC PROBLEM

Following previous columns included in the Clinical Insights section of the PASPCR Newsletters, we are sharing our experience and thoughts about a less common pigmentary skin condition with unique profile and relatively limited treatment possibilities: idiopathic guttate hypomelanosis (IGH). While not as explored as other hypomelanotic disorders (i.e., vitiligo), IGH is seen in clinic and requires careful diagnosis and attention to patients, being cosmetically troublesome in dark skin phototypes.

Skin photoaging caused by the effects of cumulative prolonged sun exposure and intrinsic aging is one of the top concerns coming to the attention of dermatologists around the world. It has a polymorphic clinical picture, with progressive evolution, which follows four stages, according to Glogau classification (Ortonne, 2001). The early stages (Glogau I and II) are characterized by a continuous stimulation of pigmentary system, with increase in number of melanocytes and melanin production, and are clinically most often manifested as solar lentigines. With advanced age, dyschromic changes occur (Glogau III), in the form of a mottled appearance; this appearance is the result of the increased, alternating with decreased DOPA-positivity of melanocytes in the chronically sun-exposed skin, and of an irregular distribution of melanosomes within epidermal keratinocytes. In Glogau IV the skin becomes yellow-gray and wrinkled.

IGH is the most common hypomelanotic disorder of photoaged skin and has the following distinct features: a high frequency worldwide, increasing with advanced age, unaesthetic clinical aspect, lack of spontaneous resolution and of therapeutic response, and irreversible evolution after the onset. IGH is characterized by acquired multiple small, discrete, round or oval, porcelain-white 1-5 mm hypopigmented or achromic macules distributed on the sun-exposed surfaces (Figure 1). The most common sun exposed sites are the forearms and legs, the lesions being usually associated with other skin changes of chronological aging and photodamage (wrinkles, solar lentigines, cutaneous xerosis, freckles, actinic keratoses) (Shin et al, 2011). The face, chest and upper back are inexplicably not involved in early IGH. The terminal hairs within the lesions often remain pigmented. Previous reports showed that IGH is most commonly a complaint of middle-aged, light-skinned women, although its presence in dark skin phototypes is not uncommon. IGH is increasingly seen in both sexes; reports showed that, of affected individuals, only 28% were <30 years old, while >70% were of >40 years old (Falabella et al, 1986; Shin et al, 2011). The higher frequency reported in women, is supposedly the result of an increased subjective perception of cosmetic disfigurement in women versus men (Kim et al, 2010).



Figure 1. Idiopathic guttate hypomelanosis: small non-scaly porcelain-white macules scattered on the chest.

IGH diagnosis is usually clinical. A Wood light examination could be helpful in revealing suspected cases and the DOPA staining can be useful in showing decreased DOPA-positive melanocytes. In uncertain cases, a skin biopsy can confirm the diagnosis.

Our department has a vast experience with cases of vitiligo and other pigmentary disorders, including IGH. We and others observed in clinical practice that early stages of vitiligo can mimic IGH. In more advanced stages the differences between the two entities can be distinguished on clinical exam: vitiligo patches have well defined borders which enlarge gradually and lack the typical porcelain aspect of IGH. IGH rarely repigment after treatment or spontaneously, and the perifollicular repigmentation pattern present in vitiligo is not observed in IGH. Although a reduced number of melanocytes is present in the IGH epidermis, they are completely eliminated in vitiligo. It is noteworthy that many patients with vitiligo and IGH relate the onset of the depigmentation to sun exposure, even without a typical sunburn. We searched retrospectively the clinical records of a group of 425 new patients who addressed to our dermatology outpatient clinic between March 2012 and March 2013; of them, eleven women (nine African-Americans and two Caucasian, with ages between 43-77 years), had, as one of their concerns, white spots on the shins (with or without the affect of other sun exposed areas), that were diagnosed as IGH. All cases had other associated photodamage changes. In three of them IGH associated vitiligo, the latter showing some improvement with the topical treatments (corticosteroids, calcineurin inhibitors, vitamin D analogs) with or without phototherapy; none of the eleven patients showed improvement of the IGH lesions, most of them choosing only the daily application of a sunscreen.

Other groups reported a variety of treatments, including cryotherapy, superficial dermabrasion, topical steroids, and topical retinoids, and in general described modest therapeutic responses. Minigrafts of normal skin implanted in IGH lesions did not modify the achromic defects, whereas intralesional triamcinolone injections

with or without grafts improved the appearance of these lesions (Falabella et al, 1986). IGH lesions clinically improved after 4 months application of topical tretinoin with almost complete recovery of skin glyphics and partial repigmentation, and restoration of skin elasticity (Pagnoni et al, 1999). However, the cosmetic outcome was not satisfactory, because of the lightening effect of tretinoin in the surrounding normal skin. Considering the lack of a satisfactory treatment, prevention measures (sun protection) should begin in early childhood and extend throughout life. Avoiding sun tanning is an important adjunct to prevention, as tanning accentuates the process and intensifies the pigmentary contrast.

The unique profile of IGH warrants more research into the mechanisms responsible for this hypomelanotic condition. The typical histopathological features of the white macules are a flattening of the dermal-epidermal junction, moderate to marked reduction in the number of DOPA-, c-KIT- and TRP1-positive melanocytes in the basal layer (Ortonne and Perrot, 1980; Wallace et al, 1998). Ultrastructurally, some of the melanocytes have normal melanogenic activity and contain numerous melanosomes while others contain only immature melanosomes and present some degenerative changes (attenuated dendrites, dilatation of the endoplasmic reticulum, swelling of the mitochondria) (Vachiramou, 2001; Kim et al, 2010). The melanosome content of the epidermal keratinocytes is overall decreased.

The pathogenesis of IGH remains unknown, although several plausible explanations were advanced:

- a. The hypothesis of age-related somatic mutations
- b. Possible inhibition of tyrosinase activity due to a reduction in catalase
- c. The decrease in melanocyte number as a result of early aging of the skin (as it is most commonly seen in elderly people)
- d. The triggering effect of microtrauma (although the supposition remains controversial) (Shin et al, 2001; Kim et al, 2010)

- e. Genetic non-environmental triggers (frequent clustering of cases within families, compared with unaffected controls) (Falabella et al, 1986); a small case-control study of candidate genes in renal transplant patients with IGH showed some association with HLA-DQ3 and lack of association with HLA-DR8 (Arrunategui et al, 2002)
- f. Direct cytotoxicity from chronic exposure to UV radiation which causes the loss of melanocytes. This is supported by arguments like: 1. Occurrence of the IGH lesions on the sun-exposed areas on patients with a personal history of chronic exposure; 2. IGH-like lesions are often developed after PUVA or NB-UVB phototherapy (Friedland et al 2010). Both short intense UV exposure, but also cumulative exposures were incriminated. It is noteworthy that, according to studies in mice, pigment cells can be killed by large doses of PUVA, being susceptible to UV injury (Friedland et al 2010).

Considering its cosmetically unacceptable clinical picture causing patients' distress, this insufficiently explored disease needs more attention, that can be focused on two directions:

1. A more in-depth basic research, to bring light into the yet undiscovered mechanisms.
2. Since there is no definite treatment for this condition, the preventive measures are particularly essential. With the known relationship between sun exposure and IGH, we strongly encourage the clinician to educate population on sun avoidance and sun protection

Contacts:

Dr. Stanca Birlea and Dr. David Norris

University of Colorado

Department of Dermatology

12801 E. 17th Avenue MS 8127

Aurora, CO 80045 U.S.A.

E-mail: Stanca.Birlea@ucdenver.edu

David.Norris@ucdenver.edu

with appropriate clothing and sunscreen with broad spectrum starting at early ages.

REFERENCES

- Arrunategui, A., R.A.Trujillo, M.P.Marulanda, F.Sandoval, A.Wagner, A.Alzate, R.Falabella. 2002. HLA-DQ3 is associated with idiopathic guttate hypomelanosis, whereas HLA-DR8 is not, in a group of renal transplant patients. *Int J Dermatol.* 41:744-747.
- Falabella, R., C.Escobar, N.Giraldo, P.Rovetto, J.Gil, M.I.Barona, F.Acosta, A.Alzate. On the pathogenesis of idiopathic guttate hypomelanosis. 1987. *J Am Acad Dermatol.* 16:35-44.
- Friedland, R., M.David, M.Feinmesser, S.Fenig-Nakar, E.Hodak. 2010. Idiopathic guttate hypomelanosis-like lesions in patients with mycosis fungoides: a new adverse effect of phototherapy. *J Eur Acad Dermatol Venereol.* 24:1026-1030.
- Kim, S.K., E.H.Kim, H.Y.Kang, E.S.Lee, S.Sohn, Y.C.Kim. 2010. Comprehensive understanding of idiopathic guttate hypomelanosis: clinical and histopathological correlation. *Int J Dermatol.* 49:162-166.
- Ortonne, J. P. 2001. Dyspigmentation of aged skin. *Eur J Dermatol.* 11:168-169.
- Ortonne, J.P., H.Perrot. 1980. Idiopathic guttate hypomelanosis. Ultrastructural study. *Arch Dermatol.* 116: 664-668.
- Pagnoni, A., A.M.Kligman, I.Sadiq, T.Stoudemayer. 1999. Hypopigmented macules of photodamaged skin and their treatment with topical tretinoin. *Acta Derm Venereol.* 7:305-310.
- Shin, M.K., K.H.Jeong, I.H.Oh, B.K.Cho, M.H.Lee. 2011. Clinical features of idiopathic guttate hypomelanosis in 646 subjects and association with other aspects of photoaging. *Int J Dermatol.* 50:798-805.
- Vachiramon, V. 2011. Pigmentary Changes Associated with Skin Aging. 19: 28-33.
- Wallace, M.L., J.M.Grichnik, V.G.Prieto, C.R.Shea. 1998. Numbers and differentiation status of melanocytes in idiopathic guttate hypomelanosis. *J Cutan Pathol.* 25:375-379.

HOT OFF THE PRESSES

In this number we invited the lead authors of two recent publications - Drs. Feng Liu and Tatiana Krasieva - to share with us the main findings reported in Pigment Cell Melanoma Research and Journal of Biomedical Optics, respectively.

Melanoma and NMSC comparison: UV or not UV?

by Dr. Feng Liu

Publication: Liu F, Bessonova L, Taylor TH, Ziogas A, Meyskens FL Jr., Anton-Culver H. A unique gender difference in early onset melanoma implies that in addition to ultraviolet light exposure other causative factors are important. *Pigment Cell Melanoma Res* 2013, 26(1):128-135.

What led to the study: This study originated from a critique that I received for my career development award application from NCI. I submitted a molecular epidemiology grant with Drs. Frank Meyskens, Hoda Anton-Culver and Argyrios Ziogas as my mentors. One of the major criticisms was that I did not have an epidemiology background. To obtain such training, I began my work with nationally renowned epidemiologist Dr. Anton-Culver who suggested that I should examine melanoma databases. I found that incidence rate was higher for young women than for young men in the US SEER17 database. To address whether this is caused by UV radiation, my mentors suggested using NMSC incidence rate as a UV-causative control for melanoma.

Summary of results: By comparing the age- and gender-specific incidence rates between melanoma and non-melanoma skin cancer (NMSC) in the Nordic Cancer Registry database, we have discovered that young women are at higher risk for melanoma, but not for NMSC, than young men. The peak difference of melanoma incidence rate between genders is at age 20-24 years (for women RR = 2.33, 95% CI is 2.09 to 2.61), where no difference was observed for incidence rate for NMSC for this age group (RR = 0.86, 95% CI is 0.64 to 1.17). In the old age groups (>50 years), the RR pattern is similar for melanoma and NMSC, suggesting a shared UV radiation impact.

Impact to the scientific community: While it has been known that young women are more susceptible to melanoma than young men, the

comparison of age- and gender-specific incidence rates between melanoma and NMSC was not performed before, largely because data for NMSC was not reported for most countries including the USA. Our study suggests that in early onset melanoma, UV radiation may play a less important role while etiological factors such as gender-related factors including hormones may be more important.

Impact to the public: Numerous epidemiology studies of hormone impact (including hormone replacement therapy, oral contraceptive use and pregnancy) on melanoma incidence rate have been carried out and provided strong evidence that these events do not increase melanoma incidence rate in women. Hence, the precise mechanism leading to high melanoma incidence rate in young women is still not understood, and needs further research at various levels. Understanding these mechanisms is very important for effective prevention, and may also result in differential treatment approaches.

Contact:

Feng Liu, Ph.D.

Assistant Professional Researcher
Department of Medicine
Chao Family Comprehensive Cancer Center
University of California Irvine Medical School
B200 Sprague Hall (Lab)
244 Irvine Hall (Office)
Irvine, CA 92697

Phone: 949-824-2778 (Lab)
949-824-3150 (Office)

Two-photon excited fluorescence provides a clear fingerprint identification of keratin, eumelanin, and pheomelanin in a single, label-free image. This could potentially be used for rapid characterization and imaging of melanoma *in-vitro* and *in-vivo*.

by Dr. Tatiana Krasieva

Publication: Krasieva TB, Stringari C, Liu F, Sun CH, Kong Y, Balu M, Meyskens FL, Gratton E, Tromberg BJ. Two-photon excited fluorescence lifetime imaging and spectroscopy of melanins in vitro and in vivo. *J Biomed Opt* 2013, 18(3): 31107.

Recently we have published an article in the *Journal of Biomedical Optics* (Krasieva et al., 2012) about a new method for distinguishing and measuring human eumelanin and pheomelanin in cells and tissue. The method is based on two-photon excited fluorescence (TPEF) using short-pulse near infrared (NIR) lasers. It is rapid, label-free, and non-destructive.

Currently, the total melanin content (eumelanin plus pheomelanin) in biological specimens is typically determined by measuring light absorption at 450 to 475 nm after alkaline degradation (Kadekaro et al., 2003). Due to a lack of understanding of the structures of eumelanin and pheomelanin, it has not been possible to directly measure these two types of melanins. Ito and Fujita developed an HPLC-based method to indirectly measure eumelanin and pheomelanin after a series of degradation and oxidation steps (S. Ito, Fujita, K., 1985; S. Ito, Wakamatsu K., 1994). Because of the complicated processing steps and amplification constant used in this method, a small error in the HPLC measurement can result in a large error in the final reading.

Changes in the amounts of cellular eumelanin and pheomelanin have been associated with carcinogenesis. Thus rapid, non-degrading methods enabling researchers to distinguish between those two melanins would be highly desirable. Researchers from Duke University have developed a promising pump-probe imaging approach (Matthews, Piletic, Selim, Simpson, & Warren, 2011; Matthews, Wilson, et al., 2011) for separating pheomelanin from eumelanin and have demonstrated its performance in excised human pigmented lesions and *in-vivo* in a murine model. Other optical approaches rely on reflectance

spectroscopy (Marchesini, Bono, & Carrara, 2009) and absorption spectroscopy (Zonios, 2008).

There is a limited amount of published data on the fluorescence of naturally occurring melanins. *In-vivo* excitation of fluorescence using visible light is impractical due to low quantum yields, poor light penetration in tissue, and the strong, broadband melanin absorption which can lead to self-quenching and photodamage. NIR two-photon excitation is advantageous due to lower scattering, enhanced skin penetration, and reduced photodamage. We examined and characterized naturally occurring keratin, eumelanin and pheomelanin in human hair of different colors (red, brown and gray) using TPEF. We found that the pheomelanin emission peaks at approximately 615 to 625 nm and eumelanin exhibits a broad maximum at 640 to 680 nm. Based on these data we defined an optical melanin index (OMI) as the ratio of fluorescence intensities at 645 and 615 nm. The measured OMI for the MNT-1 melanoma cell line is 1.6 ± 0.22 while the Mc1R gene knockdown lines MNT-46 and MNT-62 show substantially greater pheomelanin production (OMI 0.5 ± 0.05 and 0.17 ± 0.03 , respectively). The measured values were in good agreement with chemistry-based melanin extraction methods.

In-vitro measurements were obtained from melanoma cells and artificial tissue constructs, and *in-vivo* from healthy volunteers. For this is a microscopy-based method, it provides us with both spectral properties (ability to separate the melanins) and spatial information (providing sub-micron resolved images). It is a label-free method relying on native properties of cells and tissues. So, in order to better separate melanin

fluorescence from other intrinsic fluorophores, we performed fluorescence lifetime imaging microscopy of *in-vitro* specimens. The relative concentrations of keratin, eumelanin, and pheomelanin components were mapped with the sub-cellular accuracy. Our results suggest that a noninvasive TPEF index based on spectra and lifetime could potentially be used for rapid melanin ratio characterization both *in-vitro* and *in-vivo*.

REFERENCES

- Ito, S., Fujita, K. (1985). Microanalysis of eumelanin and pheomelanin in hair and melanomas by chemical degradation and liquid chromatograph. *Anal Biochem*, 144(2), 9.
- Ito, S., Wakamatsu K. (1994). An improved modification of permanganate oxidation of eumelanin that gives a constant yield of pyrrole-2,3,5-tricarboxylic acid. *Pigment Cell Res.*, 7(3), 4.
- Kadekaro, A. L., Kavanagh, R. J., Wakamatsu, K., Ito, S., Pipitone, M. A., & Abdel-Malek, Z. A. (2003). Cutaneous Photobiology. The Melanocyte vs. the Sun: Who Will Win the Final Round? *Pigment Cell Research*, 16(5), 434.
- Krasieva, T. B., Stringari, C., Liu, F., Sun, C.-H., Kong, Y., Balu, M., et al. (2012). Two-photon excited fluorescence lifetime imaging and spectroscopy of melanins in vitro and in vivo. *Journal of Biomedical Optics*, 18(3), 031107.
- Marchesini, R., Bono, A., & Carrara, M. (2009). In vivo characterization of melanin in melanocytic lesions: spectroscopic study on 1671 pigmented skin lesions. *Journal of Biomedical Optics*, 14(1), 014027.
- Matthews, T. E., Piletic, I. R., Selim, M. A., Simpson, M. J., & Warren, W. S. (2011). Pump-Probe Imaging Differentiates Melanoma from Melanocytic Nevi. *Science Translational Medicine*, 3(71), 71ra15.
- Matthews, T. E., Wilson, J. W., Degan, S., Simpson, M. J., Jin, J. Y., Zhang, J. Y., et al. (2011). In vivo and ex vivo epi-mode pump-probe imaging of melanin and microvasculature. *Biomed. Opt. Express*, 2(6), 1576-1583.
- Zonios, G., Dimou, A., Bassukas, I., Galaris, D., Tsolakidis, A., & Kaxiras, E.. (2008). Melanin absorption spectroscopy: new method for noninvasive skin investigation and melanoma detection. *J. Biomed. Opt.*, 13(1), 014017.

Contacts:

Tatiana B. Krasieva, Ph.D.

Project Scientist

Laser Microbeam and Medical Program (LAMMP) Microscopy Resource Director

Beckman Laser Institute and Medical Clinic

University of California, Irvine, CA 92697

Phone: (949) 824-3664

Fax: (949) 824-8413

E-mail: tkrasiev@uci.edu

Web-page: <http://www.bli.uci.edu/lammp/>

Frank L. Meyskens, Jr., M.D., F.A.C.P.

The Daniel G. Aldrich, Jr. Endowed Chair

Professor of Medicine, Biological Chemistry
and Public Health

Vice Dean, School of Medicine

Director Emeritus, Chao Family Comprehensive Cancer Center

University of California, Irvine

Phone: 714-456-6310

Fax: 714-456-2240

E-mail: flmeyske@uci.edu

MEMBERS IN THE NEWS

The group of scientists led by **PASPCR President-elect, Dr. Caroline le Poole**, recently published their findings on a modified HSP70 that holds promise in treatment of vitiligo. The authors showed that in a mouse model of depigmentation, modified inducible heat shock protein 70 (HSP0i) prevented T cell-mediated depigmentation. The mutant protein was able to reverse the autoimmune response involved in vitiligo. Some of the effects observed in mice were also reported in human skin specimens.

The citation for this breakthrough manuscript is:

J. A. Mosenson, A. Zloza, J. D. Nieland, E. Garrett-Mayer, J. M. Eby, E. J. Huelsmann, P. Kumar, C. J. Denman, A. T. Lacey, F. J. Kohlhapp, A. Alamiri, T. Hughes, S. D. Bines, H. L. Kaufman, A. Overbeck, S. Mehrotra, C. Hernandez, M. I. Nishimura, J. A. Guevara-Patino, I. C. Le Poole, Mutant HSP70 Reverses Autoimmune Depigmentation in Vitiligo. *Sci. Transl. Med.* **5**, 147ra28 (2013).

<http://www.ncbi.nlm.nih.gov/pubmed/23447019>.

- // -

POSITIONS WANTED/AVAILABLE

Postings for **Positions Wanted** will be open only to members of the PanAmerican Society for Pigment Cell Research (PASPCR) or its sister Societies (ASPCR, JSPCR and ESPCR). Postings for **Positions Available** will be open to all individuals and institutions so long as the position is related to pigment cell research. Please send postings to paspcr.newsletters@gmail.com.

*The postings will remain on the **Positions Wanted and Available** section of the PASPCR Newsletter and on the web page for 1 year, unless other arrangements are made. Please provide an expiration date for any submitted posting if less than 1 year. Final decisions will be made by the Publications Committee of the PASPCR.*

- // -

Position Available

A **postdoctoral fellowship** position is *immediately available* in the laboratory of
Zalfa Abdel-Malek, Ph.D.
Department of Dermatology
University of Cincinnati College of Medicine, Cincinnati, Ohio

The focus of Dr. Abdel-Malek's research is the photobiological responses of human melanocytes, modulation of these responses by melanocyte stimulating hormone and the melanocortin 1 receptor, and the signaling pathways activated by UV-induced paracrine and autocrine factors. These projects are funded primarily by NIH R01 grants. Since the position of postdoctoral fellow is supported by NIH T32 training grant, the candidate should be an American citizen or a permanent resident of the U.S.A.

Minimum requirements for the position are a Ph.D. in Biology, with expertise in cell and molecular biology techniques, including tissue culture, immunocytochemistry, Western blotting, and PCR. The candidate should be willing to work collaboratively as a team member.

Interested candidates must immediately contact Zalfa Abdel-Malek by email at abdelmza@ucmail.uc.edu.

2013 PASPCR MEMBERSHIP LIST

Dear PASPCR members,

Thank you for supporting our Society and paying your dues in time! I am pleased to announce that the first person who renewed for 2013 is Dr. Tae-Jin Yoon from Gyeongsang National University Hospital, and the first person who joined the Society for 2013 is Dr. David Norris from University of Colorado.

Andrzej Slominski

The PASPCR Membership List is published in the April issue of the PASPCR Newsletter. However, the membership is updated continuously and the names and addresses of new members and any changes in members' contacts are published during the year in the remaining two issues. Therefore, please inform the Secretary/Treasurer of any changes in your contact info that happen during the year so we could communicate them to the members through the Newsletter.

Abdel-Malek, Zalfa A. Ph.D.
University of Cincinnati
Department of Dermatology
231 Albert Sabin Way
Cincinnati, OH 45267 U.S.A.
Phone: 513-558-6246
Fax: 513-558-0198
E-mail: abdelmza@uc.edu
Regular member

Arnheiter, Heinz Ph.D.
NINDS/NIH
Bldg. 35, Room 2A201
35 Convent Drive MSC 3706
Bethesda, MD 20892 U.S.A.
Phone: 301-496-1645
Fax: 301-482-7686
E-mail: Ha3p@nih.gov
Regular member

Bagnara, Joseph T. Ph.D.
University of Arizona
Department of Cell Biology and Anatomy
1501 N. Campbell
Tucson, AZ 85724 U.S.A.
Phone: 520-621-7516
Fax: 520-621-9339
E-mail: bagnara@u.arizona.edu
Honorary member

Barsh, Greg S. M.D., Ph.D.
HudsonAlpha Institute for Biotechnology
601 Genome Way
Huntsville, AL 35806 U.S.A.
Phone: 256-327-5266
Fax : 256-327-0978
E-mail: gbarsh@hudsonalpha.org
Regular member

Belitsky, Jason M. Ph.D.
Oberlin College
Department of Chemistry and Biochemistry
119 Woodland Street
Oberlin, OH 44074 U.S.A.
Phone: 440-775-8303
Fax: 440-775-6682
E-mail: jason.Belitsky@Oberlin.edu
Regular member

Bhawan, Jag M.D.
Boston University School of Medicine
Department of Dermatology
609 Albany Street, Room J 309
Boston, MA 02118 U.S.A.
Phone: 617-638-5570
Fax: 617-638-5575
E-mail: jbhawan@bu.edu
Regular member

Bonte, Frederic Ph.D.
LVMH Recherche
185 Avenue De Verdun
St. Jean De Braye 45804 FRANCE
Phone: 33-0238-60-3388
Fax: 33-0238-60-3117
E-mail: fredericbonte@research.lvmh-pc.com
Regular member

Bosko, Carol Ph.D.
Unilever Research
Department of Skin Bioscience
40 Merritt Blvd.
Trumbull, CT 06611 U.S.A.
Phone: 203-381-5727
Fax: 203-381-5476
E-mail: carol.bosko@unilever.com
Regular member

Bowers, Roger R. Ph.D.
California State University, Los Angeles
Department of Biology
5151 State University Drive
Biological Sciences Building 333
Los Angeles, CA 90032 U.S.A.
Phone: 323-343-2081
Fax: 323-343-6451
E-mail: rbowers@calstatela.edu
Honorary member

Brilliant, Murray Ph.D.
Marshfield Clinic Foundation
1000 Oak Avenue
Marshfield, WI 54449 U.S.A.
Phone: 715-221-6469
Fax: 715-389-4950
E-mail: brilliant.murray@mcrf.mfldclin.edu
Regular member

Carlson, Andrew J. M.D.
Albany Medical College, MC-81
Department of Pathology
47 New Scotland Avenue; ML-81
Albany, NY 12208 U.S.A.
Phone: 518-262-6414
Fax: 518-262-6251
E-mail: carlsoa@mail.amc.edu
Regular member

Cassidy, Pamela Ph.D.
Huntsman Cancer Institute
2000 Circle of Hope, Room 5246
Salt Lake City, UT 84112 U.S.A.
Phone: 801-581-6268
Fax: 801-585-7477
E-mail: pamela.cassidy@hci.utah.edu
Regular member

Chen, Suzie Ph.D.
Rutgers University
The State University of New Jersey
Ernest Mario School of Pharmacy
Susan Lehman Cullman
Laboratory for Cancer Research
164 Frelinhuysen Road
Piscataway, NJ 08854 U.S.A.
Phone: 732-445-3400 (x227)
Fax: 732-445-0687
E-mail: suziec@rci.rutgers.edu
Regular member

Cheng, Tsing Ph.D.
New York University Medical Center
Department of Dermatology
Smilow Research Center, Room 401
New York, NY 10016 U.S.A.
Phone: 212-263-9077
E-mail: tsing.cheng@nyumc.org
Student member

Cornell, Robert A. Ph.D.
University of Iowa
Carver College of Medicine
Department of Anatomy and Cell Biology
1-400-D BSB/51 Newton Road
Iowa City, IA 52242 U.S.A.
Phone: 319-335-8908
Fax: 319-335-7198
E-mail: robert-cornell@uiowa.edu
Regular member

Costin, Gertrude-Emilia Ph.D., M.B.A.
Institute for In Vitro Sciences, Inc.
30 W Watkins Mill Road #100
Gaithersburg, MD 20878 U.S.A.
Phone: 301-947-6524
Fax: 301-947-6538
E-mail: ecostin@iivs.org
Regular member

de la Serna, Ivana L. Ph.D.
University of Toledo College of Medicine
Department of Biochemistry
and Cancer Biology
Mail Stop #1010, Health Science Campus
3000 Arlington Avenue
Toledo, OH 43614 U.S.A.
Phone: 419-383-4111
Fax: 419-383-6228
E-mail: ivana.delaserna@utoledo.edu
Regular member

Dell'Angelica, Esteban Ph.D.
University of California, Los Angeles
Department of Human Genetics
Gonda Center, Room 6357B
Los Angeles, CA 90095 U.S.A.
Phone: 310-206-3749
Fax: 310-794-5446
E-mail: edellangelica@mednet.ucla.edu
Regular member

Diwakar, Ganesh Ph.D.
Amway Corporation
Analytical Sci., BIO-ASSAY
Group-Pigmentation
7575 Fulton St. East
Ada, MI 49301 U.S.A.
Phone: 616-787-5992
Fax: 616-787-4466
E-mail: ganesh.diwakar@amway.com
Regular member

Erf, Gisela F. Ph.D.
University of Arkansas
Department of Poultry Science O-410
1260 W. Maple Street
Fayetteville, AR 72701 U.S.A.
Phone: 479-575-8664
Fax: 479-575-7139
E-mail: gferf@uark.edu
Regular member

Ganesan, Anand K. M.D., Ph.D.
University of California Irvine
Department of Dermatology and Biological Chemistry
1324 Sprague Hall
Irvine, CA 92697 U.S.A.
Phone: 949-824-2926
Fax: 949-924-7454
E-mail: aganesan@uci.edu
Regular member

Glass, Kelly
FFSC
124 Science Drive 1205
P.O. Box 90347
Durham, NC 27708 U.S.A.
Phone: 336-480-5321
E-mail: kelly.glass@duke.edu
Student member

Grando, Sergei A. M.D., Ph.D., D.Sc.
University of California Irvine
Department of Dermatology
134 Sprague Hall, Zot 40406
Irvine, CA 92697 U.S.A.
Phone: 949-824-2713
Fax: 949-824-2993
E-mail: sgrando@uci.edu
Regular member

Grichnik, James M. M.D., Ph.D.
UMHC/Sylvester Comprehensive Cancer Center
Biomedical Research Building
1501 N.W. 10th Avenue, Room 912, Loc. D-1
Miami, FL 33136 U.S.A.
Phone: 305-243-6045
Fax: 305-243-6072
E-mail: grichnik@miami.edu
Regular member

Grimm, Elizabeth Ph.D.
University of Texas
MD Anderson Cancer Center
Experimental Therapeutics
1515 Holcombe Blvd., Unit 421
Houston, TX 77030 U.S.A.
Phone: 713-792-3667
Fax: 713-792-2070
E-mail: egrimm@mdanderson.org
Regular member

Gunn, Teresa M. Ph.D.
McLaughlin Research Institute
1520 23rd Street South
Great Falls, MT 59405 U.S.A.
Phone: 406-454-6033
Fax: 406-454-6019
E-mail: tmg@mri.montana.edu
Regular member

Guo, Huazhang M.D., Ph.D.
300 S. Central Ave. #c39
Hartsdale, NY 10530 U.S.A.
Phone: 914-368-2018
E-mail: huazhang.guo@gmail.com
Student member

Hakozaki, Tomohiro Ph.D.
The Procter and Gamble Company
Mason Business Center
8700 S. Mason Montgomery Road
Mason, OH 45040 U.S.A.
Phone: 513-530-6954
Fax: 513-448-6469
E-mail: hakozaki.t.1@pg.com
Regular member

Halaban, Ruth Ph.D.
Yale Medical School
Department of Dermatology
15 York Street, Hunter 604A
New Haven, CT 06510 U.S.A.
Phone: 203-785-4352
Fax: 203-785-7637
E-mail: ruth.halaban@yale.edu
Regular member

Harris, Melissa Ph.D.
NIH
Bldg. 49, Room 4A51
49 Convent Drive
Bethesda, MD 20892 U.S.A.
Phone: 301-496-7574
E-mail: harrism12@mail.nih.gov
Student member

Hearing, Vincent J. Ph.D.
NCI, National Institutes of Health
Laboratory of Cell Biology
Building 37, Room 2132
9000 Rockville Pike
Bethesda, MD 20892 U.S.A.
Phone: 301-496-1564
Fax: 301-402-8787
E-mail: hearingv@nih.gov
Regular member

Herlyn, Meenhard D.V.M.
The Wistar Institute
Program of Molecular and Cellular Oncogenesis
3601 Spruce Street
Philadelphia, PA 19104 U.S.A.
Phone: 215-898-3950
Fax: 215-898-0980
E-mail: herlynm@wistar.org
Regular member

Hornyak, Thomas J. M.D., Ph.D.
University of Maryland
School of Medicine
Department of Dermatology & Biochemistry
and Molecular Biology
108 N. Greene St., Room 308A
Baltimore, MD 21201 U.S.A.
Phone: 410-706-3725
Fax : 410-706-8297
E-mail: Thornyak@som.umaryland.edu
Regular member

Hou, Ling Ph.D.
Wenzhou Medical College
Developmental Cell Biology
and Disease Program
270 Xueyuan Road
Wenzhou, Zhejiang 325003 CHINA
Phone: 301-402-2036
E-mail: lhou88@gmail.com; lhou88@yahoo.cn
Regular member

Huang, Jennifer Ph.D.
University of Maryland School of Medicine
Department of Biochemistry and Molecular Biology
1702 N Calvert Street
Baltimore MD 21202 U.S.A.
Phone: 225-223-0748
E-mail: jmthompson@gmail.com
Student member

Huizing, Marjan Ph.D.
National Institutes of Health
NHGRI
10 Center Drive, Bldg. 10, Room 10C-103
Bethesda, MD 20892 U.S.A.
Phone: 301-402-2797
Fax: 301-480-7825
E-mail: mhuizing@mail.nih.gov
Regular member

Indra, Arup K. Ph.D.
Oregon State University
College of Pharmacy
Department of Pharmaceutical Sciences
1601 SW Jefferson Avenue
Corvallis, OR 97333 U.S.A.
Phone: 541-737-5775
Fax: 541-737-3999
E-mail: arup.indra@oregonstate.edu
Regular member

Ito, Shosuke Ph.D.
Fujita Health University
School of Health Sciences
Toyoake Aichi 470-1192 JAPAN
Phone: 81-562-93-2595
Fax: 81-562-93-4595
E-mail: sito@fujita-hu.ac.jp
Regular member

Jablonski, Nina G. Ph.D.
Pennsylvania State University
Department of Anthropology
432 West Shadow Lane
State College PA 16803 U.S.A.
Phone: 814-234-3029
E-mail: ngj2@psu.edu
Regular member

Janjetovic, Zorica Ph.D.
University of Tennessee HSC
Department of Pathology & Laboratory Medicine
19 S. Manassas Ave., Room 258
Memphis TN 38153 U.S.A.
and
120 Sawyer Circle, Apt. 394
Memphis, TN 38103 U.S.A.
Phone: 901-448-6341
Fax: 901-448-6979
E-mail: zjanjeto@uthsc.edu
Student member

Joshi, Sandeep Ph.D.
University of Maryland
Department of Biochemistry and Molecular Biology
108 N. Green Street, 3rd Floor
Baltimore MD 21201 U.S.A.
Phone: 304-617-5496
E-mail: sjoshi@som.umaryland.edu
Student member

Juryneec, Michael
University of Utah
367 Klabab Circle
Salt Lake City, UT 84109 U.S.A.
Phone: 801-949-7982
E-mail: mjuryneec@genetics.utah.edu
Student member

Kadekaro, Ana Luisa Ph.D.
University of Cincinnati
Department of Dermatology
231 Albert Sabin Way, Room 7409
PO Box 670592
Cincinnati, OH 45267 U.S.A.
Phone: 513-558-6659
Fax: 513-558-0198
E-mail: kadekaal@uc.edu
Regular member

Katayama, Ichiro Ph.D.
2-2 Yamadaoka
Suita, NA 5650871 JAPAN
E-mail: katayama@derma.med.osaka-u.ac.jp
Regular member

Kim, Tae-Kang Ph.D.
University of Tennessee
Department of Pathology & Laboratory Medicine
19 S. Manassas Ave.
Memphis, TN 38163 U.S.A.
Phone: 901-448-6341
Fax: 901-448-3745
E-mail: tkim10@uthsc.edu
Student member

King, Richard A. M.D., Ph.D.
University of Minnesota
MMC 485 Mayo
420 Delaware Street, S.E.
Minneapolis, MN 55455 U.S.A.
Phone: 612-624-6657
Fax: 612-624-6645
E-mail: kingx002@umn.edu
Honorary member

King, Roy M.D.
10207 Thimble Fields Dr.
Knoxville TN 37922 U.S.A.
Phone: 865-386-8911
Fax: 865-560-2784
E-mail: royelisa@tds.net
Regular member

Kiyohara, Eiji
1630 Eastborne Avenue #301
Los Angeles, CA 90024 U.S.A.
Phone: 310-990-0224
E-mail: eiji-8-15@smile.ocn.ne.jp
Student member

Kobayashi, Nobuhiko M.D., Ph.D.
Nara Medical University School of Medicine
Department of Dermatology
Kashihara Nara 634-8522 JAPAN
Phone: 81-744-29-8891
Fax: 81-744-25-8511
E-mail: nobuk2@naramed-u.ac.jp
Regular member

Kos, Lidia Ph.D.
Florida International University
Department of Biological Sciences
11200 S.W. 8th Street
Miami, FL 33199 U.S.A.
Phone: 305-348-6678
Fax: 305-348-1986
E-mail: kosl@fiu.edu
Regular member

Kovacic, Diane M.D.
University of Tennessee HSC
Department of Pathology
930 Madison Avenue, Suite 500
Memphis, TN 38163 U.S.A.
Phone: 201-723-4094
E-mail: dkovacic@optoline.net
Student member

Kubic, Jeniffer D. Ph.D.
University of Chicago
Department of Dermatology
5841 South Maryland Avenue
MC 5067 L518B
Chicago, IL 60637 U.S.A.
Phone: 773-702-6486
E-mail: jkubic@medicine.bsd.uchicago.edu
Student member

Lai, Yung-Chih
E-mail: d92b41001@ntu.edu.tw
Student member

Lamoreux, M. Lynn Ph.D.
8255 Sandy Point Road
Bryan, TX 77807 U.S.A.
E-mail: LynnLamoreux@Yahoo.com
Honorary member

Le Poole, I. Caroline Ph.D.
Loyola University Medical Center
Department of Pathology
Cancer Center, Bldg. 112, Room 203
2160 South First Avenue
Maywood, IL 60153 U.S.A.
Phone: 708-327-2032
Fax: 708-327-3238
E-mail: ilepool@lumc.edu
Regular member

Leachman, Sancy A. M.D., Ph.D.
University of Utah, Huntsman Cancer Institute
Department of Dermatology
2000 Circle of Hope, Suite 5242
Salt Lake City, UT 84112 U.S.A.
Phone: 801-585-9427
Fax: 801-585-7477
E-mail: sancy.leachman@hci.utah.edu
Regular member

Leming, Philip D. M.D.
TCHMS
2727 Madison Rd. Suite 400
Cincinnati OH 45209 U.S.A.
Phone: 513-321-4333
Fax: 513-533-6033
E-mail: pianoblues@aol.com
Regular member

Lin, Sung-Jan Ph.D.
No. 7 Chung-Shah South Road
Taipei, NA 00100 TAIWAN
E-mail: drsjin@ntu.edu.tw
Regular member

Lister, James A. Ph.D.
Virginia Commonwealth University
Department of Human Genetics
Sanger Hall 11-014
1101 E. Marshall Street
Richmond, VA 23298 U.S.A.
Phone: 804-628-4518
Fax: 804-827-1124
E-mail: [jalister@vcu.edu](mailto:jalistler@vcu.edu)
Regular member

Loftus, Stacie K. Ph.D.
National Institutes of Health
National Human Genome Research Institute
Genetic Disease Research Branch
49 Convent Dr., Bldg. 49, Room 4A66
Bethesda, MD 20892 U.S.A.
Phone: 301-594-1752
Fax: 301-402-2170
E-mail: sloftus@mail.nih.gov
Regular member

Loy, Chong J. Ph.D.
Johnson and Johnson Co.
51 Science Park Road #01-01
The Aries Singapore Science Park 2
Singapore 117586 SINGAPORE
Phone: 656-720-6307
Fax: 656-464-1382
E-mail: cloy@its.jnj.com
Regular member

Manga, Prashiela Ph.D.
New York University School of Medicine
Department of Dermatology
Smilow Research Center
522 First Avenue, Room 401
New York, NY 10016 U.S.A.
Phone: 212-263-9086
Fax: 212-263-5819
E-mail: prashiela.manga@nyumc.org
Regular member

Meadows, Gary G. Ph.D.
Washington State University
College of Pharmacy, Cancer Prevention
and Research Center
Box 646510
Pullman, WA 99164 U.S.A.
Phone: 509-335-4753
Fax: 509-335-7559
E-mail: meadows@wsu.edu
Regular member

Meyskens, Frank L. Jr. M.D.
University of California
Comprehensive Cancer Center
101 The City Drive S.
Building 56, Room 209
Orange, CA 92868 U.S.A.
Phone: 714-456-6310
Fax: 714-456-2240
E-mail: flmeyske@uci.edu
Regular member

Mintz, Beatrice Ph.D.
Fox Chase Cancer Center
333 Cottman Avenue
Philadelphia, PA 19111 U.S.A.
Phone: 215-728-2478
Fax: 215-728-3574
E-mail: beatrice.mintz@fccc.edu
Regular member

Morrison, Randall L. Ph.D.
McDaniel College
Department of Biology
2 College Hill
Westminster, MD 21157 U.S.A.
Phone: 410-857-2409
Fax: 410-386-4613
E-mail: rmorriso@mcdaniel.edu
Regular member

Mukhtar, Hasan Ph.D.
University of Wisconsin
Department of Dermatology
1300 University Avenue
Madison WI 53706 U.S.A.
Phone: 608-263-3927
Fax: 608-263-5223
E-mail: hmukhtar@wisc.edu
Regular member

Nair, Sujit Ph.D.
George Washington University Medical Center
Biochemistry and Molecular Biology Department
Ross Hall 534
2300 I Street, NW
Washington DC 20037 U.S.A.
Phone: 202-994-2799
Fax: 202-994-8974
E-mail: ssnair@gwu.edu
Regular member

Nejati, Reza M. M.D.
University of Tennessee Health Science Center
Department of Pathology & Laboratory Medicine
174 Island Bluff Drive
Memphis, TN 38103 U.S.A.
Phone: 310-448-6979
Fax: 901-448-6979
E-mail: mrnejati@yahoo.com
Student member

Nordlund, James J. M.D.
1156 Riverside
Cincinnati, OH 45202 U.S.A.
Phone: 513-871-4168
Fax: 513-871-6214
E-mail: jjnordlund@fuse.net
Regular member

Norris, David A. M.D.
University of Colorado
Department of Dermatology
12801 E. 17th Avenue MS 8127
Aurora, CO 80045 U.S.A.
Phone: 303-724-4031
Fax: 303-724-4048
E-mail: david.norris@ucdenver.edu
Regular member

Orlow, Seth J. M.D., Ph.D.
New York University Medical Center
Department of Dermatology
240 East 38th Street, 11th Floor
New York, NY 10016 U.S.A.
Phone: 212-263-5313
Fax: 212-263-8752
E-mail: seth.orlow@nyumc.org
Regular member

Panich, Uraiwan, Ph.D.
Faculty of Medicine Siriraj Hospital,
Mahidol University
Department of Pharmacology
2 Prannok Rd.
Bangkoknoi, Bangkok 10700 THAILAND
Phone: 081-815-5925
Fax: 024-195-7576
E-mail: siuks@mahidol.ac.th
Regular member

Pawelek, John M. Ph.D.
Yale Medical School
Department of Dermatology
333 Cedar Street
New Haven, CT 06520 U.S.A.
Phone: 203-687-7318
Fax: 203-785-7637
E-mail: john.pawelek@yale.edu
Regular member

Pomerantz, Seymour H. Ph.D.
59 Sereni Street, Apt. 8
Rehovot 76240 ISRAEL
Phone: 011-972-8-931-6541
Fax: 011-972-8-931-6541
E-mail: spomerantz@bezeqint.net
Honorary member

Potterf, S. Brian Ph.D.
Unilever R&D, Trumbull
Clinical Research
50 Commerce Drive
Trumbull, CT 06611 U.S.A.
Phone: 203-381-5795
Fax: 203-381-5790
E-mail: brian.potterf@unilever.com
Regular member

Reiter, Russel J. Ph.D.
University of Texas Health Science Center
Department of Cellular and Structural Biology
7703 Floyd Curl Drive
San Antonio, TX 78229 U.S.A.
Phone: 210-567-3859
Fax: 201-567-3803
E-mail: reiter@uthscsa.edu
Regular member

Rhodes, Arthur R. M.D., M.P.H.
Rush University Medical Center
Department of Dermatology
1653 W. Congress Pkwy
Annex Building Suite 220
Chicago, IL 60612 U.S.A.
Phone: 312-942-6096
Fax: 312-942-7778
E-mail: arthur_rhodes@rush.edu
Regular member

Sakata, Aya M.S.
POLA Chemical Industries
560 Kashio-cho
Totsuka-ky
Yokohama 2440812 JAPAN
E-mail: a-sakata@pola.co.jp
Regular member

Scott, Glynis M.D.
University of Rochester
Department of Dermatology / Pathology
601 Elmwood Avenue, Box 697
Rochester, NY 14642 U.S.A.
Phone: 585-275-8811
Fax: 585-273-1346
E-mail: glynis_scott@urmc.rochester.edu
Regular member

Setaluri, Vijayaradhi Ph.D.
University of Wisconsin
Department of Dermatology
1300 University Avenue, B25
Madison, WI 53706 U.S.A.
Phone: 608-263-5362
Fax: 608-263-5223
E-mail: setaluri@wisc.edu
Regular member

Silva de Castro, Caio C. M.D.
Pontificia Universidade Catolica do Parana
Department of Dermatology
Padre Anchieta
1846 cj 1014
Curitiba-Parana 80730-000 BRAZIL
Phone: 41-3566-2036
Fax: 41-3027-3186
E-mail: caio.castro@pucpr.br
Regular member

Skoboviat, Cezary Ph.D.
University of Tennessee Health Science Center
Department of Pathology & Laboratory Medicine
19 S. Manassas Avenue, Room 258
Memphis, TN 38163 U.S.A.
Phone: 901-448-6341
Fax: 901-448-6979
E-mail: cskobowi@uthsc.edu
Student member

Slominski, Andrzej T. M.D., Ph.D.
University of Tennessee
Department of Pathology
930 Madison Avenue, Room 525 (Clinical Office)
Memphis, TN 38163 U.S.A.
Phone: 901-448-3741
Fax: 901-448-6979
E-mail: aslominski@uthsc.edu
Regular member

Slominski, Radomir M.
Jagielonian University
9385 Old Plantation Cove
Germantown, TN 38139 U.S.A.
Phone: 901-758-6979
E-mail: radomir.slominski@gmail.com
Student member

Spritz, Richard A. M.D.
University of Colorado
School of Medicine
Anschutz Medical Campus
12800 E. 19th Avenue, MS 8300
Aurora, CO 80045 U.S.A.
Phone: 303-724-3107
Fax: 303-724-3100
E-mail: richard.spritz@ucdenver.edu
Regular member

Sugumaran, Manickam Ph.D.
University of Massachusetts at Boston
Department of Biology
100 Marrissey Boulevard
Boston, MA 02421 U.S.A.
Phone: 617-287-6598
Fax: 617-287-6650
E-mail: manickam.sugumaran@umb.edu
Regular member

Swope, Viki B. D.V.M.
University of Cincinnati
Dermatology Department
231 Albert Sabin Way
Cincinnati, OH 45267 U.S.A.
Phone: 513-558-3940
E-mail: viki.swope@uc.edu
Regular member

Tada, Akihiro Ph.D.
POLA Research & Development Laboratories
560 Kashio-cho, Totsuka-ku
Yokohama 244-0812 JAPAN
Phone: 81-45-826-7232
E-mail: akihiro@pola.co.jp
Regular member

Trivedi, Archit
1343 Oak Hill Court, Apt. 101
Toledo, OH 43614 U.S.A.
Phone: 567-225-6822
E-mail: archit.trivedi@roket.utoledo.edu
Student member

Van Raamsdonk, Catherine D. Ph.D.
University of British Columbia
Department of Medical Genetics
2350 Health Science Center Mall
Vancouver BC V6T123 CANADA
Phone: 604-827-4224
Fax: 604-822-5348
E-mail: cvr@mail.ubc.ca
Regular member

von Koschembahr, Anne M. B.A.
University of Cincinnati
Dermatology Department
231 Albert Sabin Way
Cincinnati, OH 45267 U.S.A.
Phone: 513-558-6242
Fax: 513-558-0198
E-mail: vonkosam@mail.uc.edu
Student member

Yoon, Tae-Jin M.D., Ph.D.
Gyeongsang National University Hospital
Department of Dermatology
49 Gangnam-ro
Jinju 660-702 KOREA
Phone: +82-55-750-8187
Fax: +82-55-758-8106
E-mail: jaymax1@dreamwiz.com
yoontj@gnu.ac.kr
Regular member

Zbytek, Blazej M.D., Ph.D.
7550 Wolf River Blvd., Suite 200
Germantown, TN 38138 U.S.A.
Phone: 901-542-6801
Fax: 901-542-6873
E-mail: bzbytek@yahoo.com
bzbytek@trumbulllabs.com
Student member

Zhou, Youwen, M.D., Ph.D.
University of British Columbia
Department of Dermatology & Skin Science
835 W. 10th Avenue
Vancouver, BC V5Z4E8 CANADA
Phone: 604-875-4747
Fax: 604-873-9919
E-mail: Youwen.Zhou@vch.ca
Regular member