



PHOTO: IPA 2017 WORLD CONGRESS COIMBRA, PORTUGAL

International Photodynamic Association (IPA) Newsletter: The very first light

12/25/17

IN THIS ISSUE

Featured in This First Issue

edited by [Huang Chiao (Joe) Huang and Pilar Acedo Nuñez]

President's note

Dear IPA members and friends,

I am delighted to introduce the first issue of the IPA newsletter, and to announce that **Dr. Huang Chiao (Joe) Huang** (Assistant Professor, Dept. of Bioengineering, University of Maryland, College Park) and **Dr. Pilar Acedo Nuñez** (Research Associate, University College London) have taken on the responsibilities of leading the Newsletter for our association.

At the IPA 2017 World Congress in Coimbra, we had agreed upon specific tasks, one of which was to have a more frequent communications with all members, and, thanks to Joe and Pilar, this is beginning to happen. In addition, our new Secretary General, **Vandana Grover, Ph.D.** has been active regularly updating the website and tweeting. So please make sure that you let all your friends and colleagues know about our new initiatives.

After the successful IPA 2017 World Congress in Coimbra, we are working hard to prepare for the **2019 World Congress in Boston**, which could be a little different from the ones in the past. We hope to have more brainstorming and discussion sessions at the upcoming meeting, and I hope you will take advantage of these unique opportunities and participate actively in these events. Moreover, it is time for the younger talents to take over the leadership of this organization, and this letter will also serve as an appeal to you to become active member in this organization.

The Board met last week and a highlight of the outcome was that we would invite two young

scientists and physicians at the student, postdocs or resident level to become active Board members in the next three months. Please look out for our announcements.

I have a vision that the IPA is not only a professional association that holds a meeting every 2 years, but it's a lively and constantly active organization where the members interact and are productive throughout to make an impact in science and medicine. Our ultimate goal is to promote the study and implementation of diagnosis and treatment using light activated photosensitizers and to make a difference both scientifically and clinically, thus the road map to impact has to be achieved by input from all fields.

As we are putting together a coherent program for the 2019 World Congress, there has already been some very enthusiastic requests and constructive input. In the coming months, I will be getting in touch with you to get few specifics on what initiatives can be carried out. **Once more, I appeal to you to become a member and encourage your colleagues to do so.**

Finally, I end this note with sad news that we have recently lost a dear colleague **Professor Yoram Salomon**, who succumbed to cancer. Yoram was a friend, a leader, a family man, and a teacher to many of us and he will be sorely missed. May you rest in peace Yoram.

Good luck to everyone,

Tayyaba Hasan, Ph.D.

President, IPA Board of Directors | Chair, IPA Congress 2019



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Cancer Research

Science Article Feature

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Latest Discussions at the Royal Society of Medicine (RSM)

Summarized by attendee Dr. Pilar Acedo Nuñez

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Congratulations to all the 2017 IPA Award Winners

by [IPA]

Check out the [press releases](#) highlighting the award recipients. Many accomplishments in PDT research at the [IPA 2017 World Congress Coimbra, Portugal](#)

- ➡ [Dr. David Kessel](#) Receives 2017 Lifetime Achievement Award in PDT Basic Research
- ➡ [Dr. Brian Wilson](#) Received 2017 Photodiagnostic Research Excellence Award
- ➡ [Dr. Nicolas Loebel](#) Receives the 2017 IPA Clinical PDT Research Excellence Award
- ➡ [Dr. Colin Hopper](#) Receives IPA Lifetime Achievement Award in PDT Clinical Research
- ➡ [Dr. Natalia Inada](#) is the Recipient of 2017 Award for PDT Clinical Trial Excellence
- ➡ [Mariana Geralde](#) is the Recipient of



2017 Basic PDT Research Excellence Award

- ➡ [Professor Michael Wilson](#) Receives IPA Lifetime Achievement Award in Antimicrobial PDT Research
- ➡ [Professor Tayyaba Hasan](#) Receives IPA Award for Significant Advancement of Photodynamic Therapy
- ➡ [Dr. Georg Widhalm](#) Receives IPA Award for PDT Research Excellence
- ➡ [Dr. Pilar Acedo Nunez](#) is the

Recipient of 2017 IPA Early Investigator Award

ACKNOWLEDGMENTS

The IPA thanks the 2017 Award Committee Chair, Carolyn Cross, M.S.C., and all the members of the 2017 Award Committee for their time and efforts.

<https://www.internationalphotodynamic.com/awards-committee/>



<https://www.internationalphotodynamic.com/>
<https://twitter.com/photodynamicIPA>
<https://www.linkedin.com/company/international-photodynamic-association-ipa>

IPA News & Updates

by [IPA Secretary General, Vandana Grover]

2017 Recap:

• Thank you to Luis Arnaut, PhD and all the members of the organizing committee for a successful [2017 IPA World Congress](#) in Coimbra, Portugal. There were 355 participants from 37 different countries, 38 PDT school, 130 invited lectures and 153 poster presentations. The abstracts presented at [IPA 2017](#) will be available on the website shortly. • We have a new IPA website and thank you to Erin Brinkman and Carolyn Cross for getting the site started. We regularly update it so check back from time to time. The IPA is now also on LinkedIn and Twitter.

Looking to 2018:

• We want to engage the broader PDT community to help provide media content. To that end we will be providing

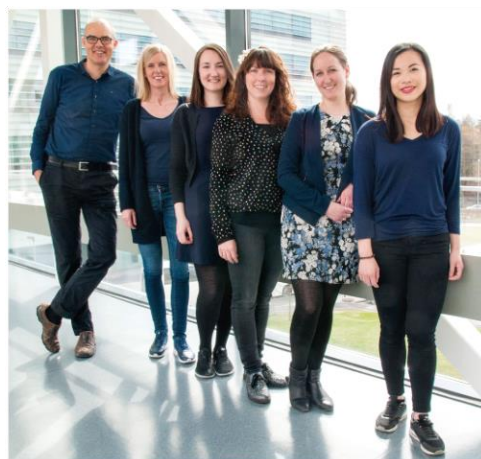
compensation to help develop more content. Please email me if you're interested in writing blog posts and articles, conducting interviews, or working on video content. • There will be IPA Board of Directors elections in 2018 with at least two new positions on the board: one for students and one for fellows. In order to run or nominate someone, you will need to be an IPA member so please [join](#). Please [email](#) me if you have any thoughts or suggestions.

Happy 2018!

[Vandana Grover, Ph.D.](#)

Secretary General, IPA Board of Directors
[@photodynamicIPA](#)

PÅL KRISTIAN SELBO'S PROJECT GROUP



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Light-controlled Delivery of Cancer Immunotherapeutics

Sequestration of therapeutic agents in endosomes and lysosomes represents a major barrier to several types of cancer therapies. Another obstacle is notoriously therapy-resistant cancer stem cells (CSCs), which are suggested to be important contributors to tumor heterogeneity. Accumulating evidence proposes CSCs to be drivers of many types of cancers due to their ability to both self-renew and differentiate. Even though the tumor shrinks during cancer therapy it will unfortunately in many cases relapse after end of treatment due to the survival of the CSCs. Hence there is a high need for novel technologies that target and kill CSCs.

We are using the intracellular drug delivery technology, photochemical internalization (PCI) to release immunotherapeutic agents, e.g. CSC-targeting monoclonal antibodies linked to protein toxins (immunotoxins) or cancer vaccine antigens, from endosomes and/or lysosomes into the cytosol of cancer cells. By other words: PCI overcomes lysosome-mediated drug resistance.

The main goal of our project group is to develop and explore novel light-controlled strategies to enhance the efficacy and the specificity of cancer immunotherapies.

ONGOING PROJECTS

PCI of Immunotoxins Targeting Cancer Stem Cells
PCI of Cancer Stem Cell-Derived Vaccine Antigens

RESOURCES AND MORE INFORMATION

Photo and Content: [Per Marius Didriksen](#); [Line Slotnaes](#); <https://www.ous-research.no/selbo/>

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Meet a Scientist: Pål Kristian Selbo, Ph.D.

edited by [Huang Chiao (Joe) Huang and Pilar Acedo Nuñez]

Dear subscribers,

We are glad to present an interview with Dr. Pål Kristian Selbo, a senior scientist and project group leader at the Norwegian Radium Hospital, Oslo University Hospital who focuses on studying light-triggered drug delivery.

Q: Why did you become a scientist?

In my childhood I was deeply captivated by the natural world. I was very interested in everything from the life on earth to the vast universe. The high fascination of biology was narrowed down to cell biology by an excellent and motivating teacher in the high school. She managed to both strengthen my curiosity and the decision to go for a university study.

Q: How did you get involved in photobiology and photodynamic therapy?

My original plan was to get a PhD in the USA directly after I received my M.Sc. degree at NTNU (Norwegian University of Science and Technology) in Trondheim, Norway in 1994. At NTNU, I was involved in a study on inflammation where I established a method to detect the mRNA for the enzyme phospholipase A₂ (secreted type, sPLA₂) by using *in situ* hybridization in inflamed tissue, including lung sarcoidosis (the favorite diagnosis of Dr. House...) and psoriasis. After this I was shortly involved as a research assistant in a project where we studied the role of sPLA₂ in the development of

atherosclerotic plaques. I used immunofluorescence for detection of the protein and became very fascinated by the use of fluorescence microscopy. I had no training in photobiology at this point; however, the mix of fluorescence and autofluorescence in the macrophages in the plaques intrigued me. Then, by chance I came over an advertisement from the Berg's lab in Oslo! Prof. Kristian Berg was looking for a PhD student for his PCI (photochemical internalization) project. On the very same day the Norwegian broadcasting channel (NRK) had as one of their breaking news reportage, one from the Norwegian Radium Hospital where photodynamic therapy was used as a promising method to treat skin cancer. I thought wow!, and immediately I sent my application. Kristian called me and invited me for an interview. And so I went down to Oslo, where I "saw the light"!

Q: You have published more than 50 scientific articles - do you have a favorite?

I have several favorites, but if I need to select only one it must be the first paper providing evidence that the PCI method works on established solid tumors: "*In vivo* documentation of photochemical internalization, a novel approach to site specific cancer therapy" (Selbo PK *et al.* Int. J. Cancer, 2001). In a proof-of-concept mouse experiment I decided to go for systemic administration of the PCI-photosensitizer (at that time AlPcS₂a) and a direct tumoral injection of the ribosomal-inactivating protein toxin gelonin (detected and characterized at our hospital in 1980!) as

model PCI drug. I got no responses on gelonin alone, weak responses on PDT alone, but the combinatorial treatment group, PCI (AIPcS2a + gelonin + light) eradicated the tumors after only one treatment. I remember the excitement and the joy of making the tumor growth response curves. The first PCI paper (Berg K *et al.* 1999), which was a pure *in vitro* work, was accepted in the Advances in brief section of Cancer Research. It was of course refused in Nature, Science and Nature Biotech., the latter was very positive but asked for *in vivo* documentation...

Q: What is your philosophy for establishing and running a thriving research lab?

My number one rule is that I will have an "open door" philosophy. Members of the team should have the opportunity to come to me at any time to ask for advice. Equally important is that there should be fun and openness among the team members. Putting together a team where all can collaborate and not compete is important. Using the whip is not my style of management. Instead, I value very much the democratic and empathic way of management. I think also it is important to not have a micromanagement style, as this is damaging for the relationship. And too much pressure kills the creativity. If there are technical problems or lack of manpower in the lab I roll up my sleeves and join them in the lab. I also strive to address the importance of integrity. This is obvious, but I always stress the importance of replication of results. We can only be proud of the novel findings if they can withstand the future tests by others. I also remind them by the very motivating factor that research at our hospital has resulted in worldwide approval of two PDT/PD-based drugs (Metvix® and Hexvix®, Photocure ASA). In the end here I would like to acknowledge my previous mentors and supervisors Professors Kristian Berg and Tayyaba Hasan. I just try to follow their ways to foster a right environment to grow.

Q: Can you tell us about something from your work that is exciting to you right now?

Recently, we have shown in collaboration with PCI Biotech, collaborators in Zürich (UHZ) and in Trondheim (NTNU) that we can strongly enhance the efficacy of protein and peptide-based vaccines. By using the PCI method we are able to release vaccine antigens into the cytosol before they are degraded and go to the MHC class II

presentation (CD4 activation). Instead, PCI activates the MHC class I presentation pathway resulting in robust cytotoxic T cell (CD8) activation in different experimental models. This has resulted in a clinical trial on healthy volunteers. In parallel with this I have to mention the project on using the PCI method to overcome therapy resistance including targeting of cancer stem cells.

Q: What, in your view, are the key challenges for translation of PCI/PDT into clinical practice?

Regarding PCI: PCI Biotech is working on this, as they are the owners of the PCI patents. They recently selected bile duct cancer (Cholangiocarcinoma) as a target indication. In Europe, this is a rare cancer with no efficient therapies, except surgery and stenting. However, most patients are unresectable at time of diagnosis. Hence, one major challenge is to recruit enough patients during the limited time of the study. However, the company has been very lucky to have several active sites in Germany, and the hope now is that more hospitals will join the coming phase II clinical trial both in Europe and in the USA.

Regarding PDT: We know that for some non-malignant and malignant indications, PDT has been or is a very good alternative. Except a few examples (such as Photofrin, Visudyne, Metvix/Levulan, Hexvix, Tookad) there is a lack of large clinical trials showing that PDT is the very best option for cancer therapy on specific cancer indications. This may have prevented the worldwide clinical success of PDT. A major challenge for PDT is also the competition with other emerging treatments such as checkpoint inhibitors and targeting therapeutics. A future trend may be to combine these treatments with PDT?

Q: As Senior Researcher at Oslo University Hospital and a member of the ESP Education and training committee, how do you advise scientists to approach their careers? Any tips to young photobiologists?

You should have realistic ambitions combined with a strong scientific curiosity. Seek to or stay in photobiology labs that are doing well (there are many worldwide). After training or obtaining a degree, have a stay in



another photobiology lab abroad to widen up your knowledge and skills. Become a member of a professional photobiology association. Several of them have programs that are designed to foster the career of young photobiologists. As a member of the executive committee of the ESP I have to mention the "5th ESP Photobiology School" in Brixen/Bressanone, Italy. This summer school provides an excellent introductory overview of all main aspects of photobiology, including photodynamic therapy, presented by experts in each area. Next possibility is 10-16 June, 2018. For more information, go to: http://www.photobiology.eu/photobiology_school

Another important thing: go to international photobiology meetings and present your work and make new contacts. You need to be visible. E.g. ASP, ESP and IPA have young investigator awards and dedicated poster sessions where you can present your work if you are not selected for an oral talk. Make the posters as good as possible – you may get an award. Some societies have also dedicated sessions for grant writing and career advice. Remember to apply for travel awards. Some societies are active on social media: follow them!

Q: What do you like to do in your spare time?

With 3 kids (2, 6 and 9 years), the spare time goes mostly to family fun and activities. When it comes to books we are currently reading everything from Norwegian/Swedish children books (there are many excellent, not only Astrid Lindgren) to J.K. Rowling's Harry Potter. Winter has arrived in Oslo, so skiing is a natural thing to do in the weekends. If bad weather, we go to the swimming hall. Late night TV is currently Game of Thrones. When the kids are getting more independent I plan to join the hospital volleyball team again and the hospital choir Coradium (which I co-initiated 20 years ago).

Featured Science Article:

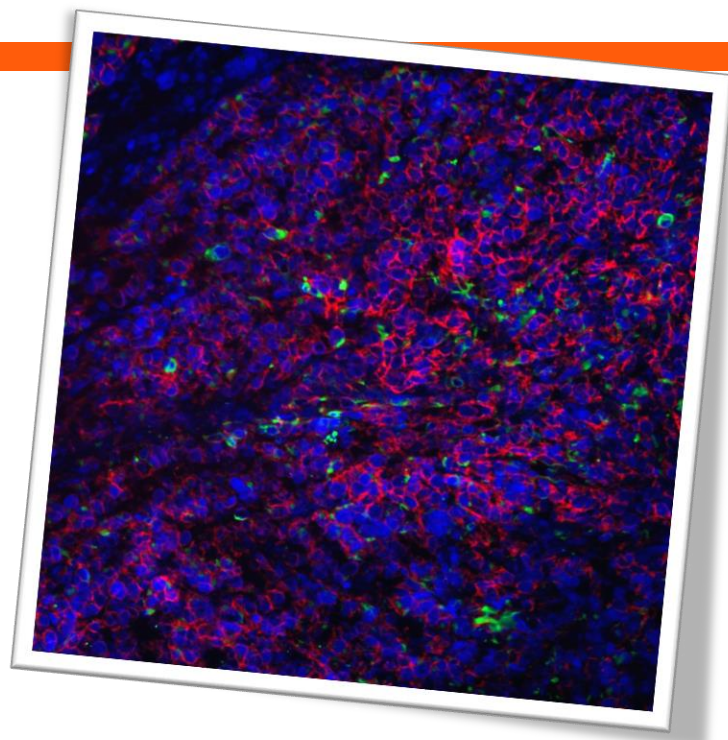
Photodynamic Priming of Tumors Mitigates Chemotherapy-based Selection of Cancer Stem Cells

by [Imran Rizvi and Huang Chiao (Joe) Huang]

Cancer Research. 2017 Nov 29. pii: canres.1700.2017. doi: 10.1158/0008-5472.CAN-17-1700.

Clinical management of cancer commonly includes the use of chemotherapy at high doses to achieve tumoricidal efficacy, particularly for the most lethal and stubborn tumors. This approach has led to modest improvements in outcomes for certain cancers, but treatment-related toxicities at the edge of tolerable doses are typically grueling and difficult for patients to cope with. After an initial response period, treatment resistance and recurrence are frequently observed, often accompanied by rapid and aggressive tumor regrowth. This portends a grim prognosis, and the disease becomes increasingly difficult to manage. The aggressive nature of recurrent tumors results, in part, from the selection pressures imposed by intensive chemotherapeutic regimens that enrich for residual clonal populations with intrinsic or acquired resistance to mechanistically analogous treatments. Strategies to mitigate these selection pressures are critically needed to improve outcomes and provide durable improvements in survival. A recent study in *Cancer Research* from the laboratory of Tayyaba Hasan demonstrates that photodynamic priming of pancreatic ductal adenocarcinoma (PDAC) abrogates chemotherapy-based selection of stem-like populations leading to a significant and sustained reduction in local and distant tumor burden, and prolonged improvements in survival, compared to the monotherapies. Building on promising pre-clinical and clinical studies, an FDA approved nanoliposomal formulation of irinotecan (nal-IRI, also known as MM-398, PEP02, BAX2398) was evaluated

in combination with PDT using nanoliposome-encapsulated benzoporphyrin derivative (nal-BPD), in two mouse models for human PDAC. In addition to suppressing aggressive tumor relapse, by mitigating chemotherapy-induced enrichment of stemness markers (CD44, CXCR4), the translationally-relevant combination regimen offers several other key advantages over chemotherapy alone. At the microenvironmental level, photodynamic priming disrupts physiological barriers to drug delivery, significantly enhancing the penetration of chemotherapy into tumors, and increasing intratumoral accumulation of nal-IRI by >10-fold. At the cellular level, photo-initiated cytotoxic mechanisms prime tumor cells for subsequent insult from a mechanistically-distinct chemotherapeutic agent (nal-IRI), thereby lowering the threshold to tumor destruction, and improving efficacy. The abrogation of aggressive tumor relapse, significant reduction in metastatic burden, and durable improvements in progression free and overall survival emphasize the feasibility and multi-pronged impact of this translationally-relevant photochemical priming approach to significantly enhance outcomes for the most lethal and challenging cancers.



FOR MORE INFORMATION

<https://www.ncbi.nlm.nih.gov/pubmed/29187403>

Huang, Rizvi, Liu et al. *Photodynamic Priming Mitigates Chemotherapeutic Selection Pressures and Improves Drug Delivery.* **Cancer Research.** 2017 Nov 29. pii: canres.1700.2017. DOI: 10.1158/0008-5472.CAN-17-1700

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Latest Discussions:

Royal Society of Medicine's PDT Symposium in London, UK

by [Pilar Acedo Nuñez]

The annual Photodynamic Therapy (PDT) symposium organized by the Royal Society of Medicine (RSM) was held on the 27th November 2017 in London, UK, attracting around 80 participants from across Europe, the USA and Canada.

This one-day event, with worldwide leaders in PDT, gave us an insight into the science and progress of this revolutionary treatment, and reviewed future research and trends. The symposium was designed to review the basic science, mechanisms and clinical applications of PDT in oncology and non-oncological conditions including local and surgical site infections and some skin, lung and head and neck cancers. Attendees had also opportunity to network with scientists and clinicians engaged in, or interested in, PDT and Photodynamic Diagnosis (PDD).

Professor Keyvan Moghissi (Consultant cardiothoracic surgeon, Yorkshire Laser Center), opened the event followed by five scientific sessions: i) What is PDT and how does it work?, ii) Role of PDT in antimicrobial and local infection, iii) PDT in dermatology, iv) Imaging and image guided surgery and therapy in oncology, and v) PDT research in progress.

Basic aspects of PDT, its mechanisms of action, and the use of nanocarriers for photosensitizers were covered during the first session by Prof. Alison Curnow (University of Exeter), Dr Ewan Eadie (NHS Tayside), Prof. Heinrich Walt and Prof. Caroline Maake (University of Zurich). Two fascinating lectures about antimicrobial pre-clinical and clinical PDT compressed the second session. Prof. Mark Wainwright (Liverpool University) and Dr Nicolas Loebel (Ondine Biomedical Inc., Canada) remarked the importance of PDT against resistant pathogens.

Prof. Sally Ibbotson (University of Dundee) and Dr Ernest Allan (Manchester) covered the PDT in dermatology session. Prof. Ibbotson gave a stimulating lecture about the use of daylight PDT for superficial

treatments, which is less painful than conventional PDT and is well tolerated by patients. A hot research area at the moment is the use of imaging and image-guided surgery and therapy in oncology. The three keynote lectures of this session completed the very diverse and interesting program. Mr. Colin Hopper together with Drs. Simon Morley and Jocelyn Brookes (UCL London Hospitals) gave us an amazing overview about different traditional and cutting-edge techniques that can be used for PDD. Mr. Hopper also delighted us with his expertise on PDT for head and neck cancers and the possibilities that PDT brings to this field. Prof. Keyvan Moghissi shared with us his knowledge in PDT for lung cancer, the future challenges in this area, the recent advances in targeted PDT using guided therapy and the relevance of PDT in combination therapies.

Supplementing the previous talks was the session called 'PDT research in progress', where Dr. Ricky Thakrar (consultant chest physician, UCL) and Mr. Mohammed Ibrahim (PhD student at University of Leeds), presented their on-going and future work focused on the PEARL trial for lung cancer and understanding mechanisms of resistance to PDT, respectively.

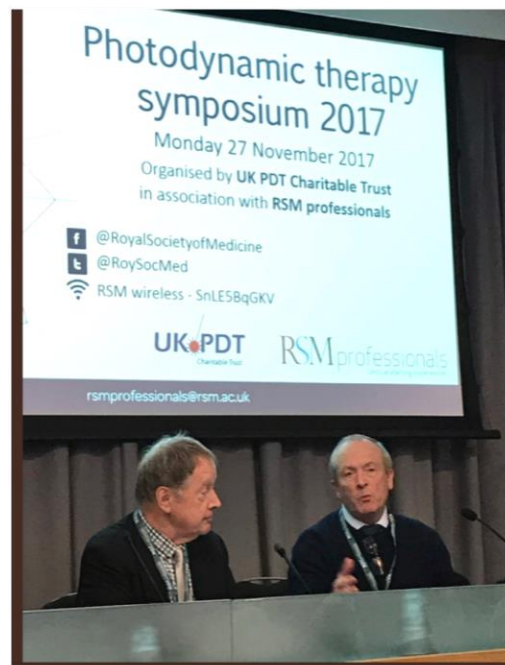
The talks were of outstanding quality and led to excellent dialogue and discussions amongst the participants, which continued during coffee breaks and lunch. Some lectures had a more pedagogical feel, engaging early career researchers working in the field of photochemistry and photobiology, getting a broad overview about PDT in a relaxed setting, which hopefully stimulated many new collaborations and ideas.

It is clear that the PDT field is still under expansion with many up-and-coming challenges and possibilities. Thank you to the organizing committee for this stimulating symposium and see you all in 2018!

AROUND TOWN



The annual Photodynamic Therapy symposium attracted participants from across Europe, the USA and Canada.



Professor Heinrich Walt (left) and Dr. Colin Hopper (right) during a discussion session at the annual Photodynamic Therapy (PDT) symposium

Resources and Opportunities

by [IPA]

Looking to reach photobiologists and related professionals on a regular basis? Put your message in their e-mail inboxes with IPA triennial e-newsletters. IPA Newsletter reaches more than 400 members with member news. Contact [Vandana Grover](#).

Upcoming PDT, PDD, and Photobiology Events

- ➔ **SPIE Photonics West**, January 24-February 1, 2018, San Francisco, CA. spie.org/conferences-and-exhibitions/photonics-west/bios/conferences
- ➔ **Boston Photonics Centennial Conference**, February 25, 2018, Cambridge, MA
- ➔ **Photosensory Receptors and Signal Transduction Gordon**

Research Conference, March 4-9 2018, Barga, Italy.

grc.org/programs.aspx?id=12955

- ➔ **38th ASLMS Annual Conference on Energy Based Medicine and Science (PAPDT Session)**, April 11, 2018 – April 15, 2018.
- ➔ **SPIE Photonics Europe**, April 22, 2018 – April 26, 2018, Strasbourg, France.
- ➔ **American Society for Photobiology (ASP) Biannual Meeting**, May 12-15 2018, Tampa, FL. photobiology.org/2018minisite
- ➔ **5th ESP Photobiology School**, June 10, 2018 – June 16, 2018, Brixen/Bressanone, Italy.
- ➔ **International Conference on Porphyrins and Phthalocyanines**

(ICPP), July 1, 2018 – July 6, 2018, Munich, Germany.

- ➔ **PDT and Photodiagnosis 2018**, September 19-22, 2018, Munich, Germany. <http://pdt2018.com>
- ➔ **17th International Photodynamic Association (IPA) World Congress**, June 28 - July 4, 2019, Boston, MA. www.ipaboston2019.org.

Opportunities

We are seeking for 2019 International Photodynamic Association (IPA) conference sponsorship. If you have questions about 2019 IPA conference sponsorship, please contact the Finance Committee Chair of IPA Congress 2019: Professor Huang Chiao (Joe) Huang @ hchuang@umd.edu.

International Photodynamic Association (IPA) Newsletter: The very first light

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WISHING YOU A VERY HAPPY NEW YEAR 2018



Huang-Chiao (Joe) Huang



Pilar Acedo Nuñez