



Welcoming
~~Overcoming~~ Trials...

International
Pachyonychia Congenita Consortium
(IPCC)
13th Annual Research Symposium

May 10-11, 2016
Scottsdale, Arizona

Pachyonychia Congenita Project

Founded in 2004, PC Project connects patients, researchers and physicians throughout the world in a united effort to help those with Pachyonychia Congenita. PC Project currently serves patients in nearly 60 countries. No matter where you live, PC Project is here to provide services and support for patients, physicians and researchers.

Fighting for a cure.

Connecting & helping patients.

Empowering research.

Int'l PC Consortium (IPCC)

Sponsored by PC Project, the IPCC is an open membership group for all researchers and physicians with an interest in Pachyonychia Congenita patients and/or research in keratin disorders. All members agree to work together to develop effective PC therapeutics. A quarterly newsletter provides IPCC members with information on recent publications, clinical trials and studies, research grants and other opportunities. Web meetings are held throughout the year presenting topics relevant to physicians treating PC patients. To join the IPCC email info@pachyonychia.org.

IPCC Steering Committee/Genetics Team 2016

Eli Sprecher—IPCC Chair (Israel)

Committee Members:

Philip David Gard

C. David Hansen

Roger L. Kaspar

W. H. Irwin McLean

Edel O'Toole

Frances J.D. Smith

Maurice A.M. van Steensel

PC Project cell phone contacts during IPCC Conference

Holly Evans 801-231-7649, Matt Morgan 801-244-4850,

Mary Schwartz 801-953-7553



Int'l PC Research Registry (IPCRR)

The International Pachyonychia Congenita Research Registry (IPCRR) is central to success in developing effective therapies for PC. The IPCRR has been selected as a participant in the Global Rare Disease Registry (GRDR) sponsored by NIH/ NCATS.

Referrals: Services of the IPCRR are available without charge to all physicians. Patients from nearly 60 countries are now enrolled in the IPCRR. Physicians may refer patients to the IPCRR for diagnostic assistance, genetic testing and support from other physicians as requested. Patients benefit with a confirmed diagnosis and become part of the PC community with connection to other patients for support and encouragement in finding best techniques and strategies to effectively manage their condition.

Publications: PC Project assists referring physicians to ensure prompt publication of the findings in quality journals. To enhance and improve the quality of publications, single-case studies are often supplemented with additional information and data from the IPCRR.

Data Access: The IPCRR data includes detailed information on PC from patient provided-physician validated data and quality photographs. Many discoveries about PC have been made through analysis of the IPCRR data. Those in the IPCC may request access to de-identified data through PC Project.

Sample Access: PC Project actively assists IPCC members in obtaining samples as needed for research projects. The samples are from genetically-confirmed patients in the IPCRR. Basic funding for projects also may be available by submitting a proposal through PC Project's open grant program.

Grants: PC Project has an open grant application process and proposals may be submitted at any time. For more information contact info@pachyonychia.org.



Tuesday May 10—Morning Session

7:00 - 8:30 **BREAKFAST**

8:30 **Welcome**

Session chair: Laure Rittié, PhD

8:45 - 8:55 **Frances J.D. Smith, PhD**

PC Genetics

9:00 - 9:20 **Eli Sprecher, MD, PhD (IPCC Chair)**

Genodermatoses and unusual modes of inheritance

9:25 - 9:45 **Pierre Coulombe, PhD**

Keratin mutation vs. pathogenesis in PC: Challenges and opportunities

9:50 - 10:00 **Catherine Pei-Ju Lu, PhD**

Stem cells in the sweat glands: wound repair and regeneration

10:05 - 10:25 **BREAK**

10:30 - 10:50 **Silviu Bril, MD**

Initial report on PC pain study and clinical exam findings

10:55 - 11:15 **Michelle Kerns, MD, PhD**

Role of oxidative stress and dysfunctional Nrf2 in PC-associated palmoplantar keratoderma

11:20 - 11:35 **Andreas Berroth, PhD**

Insights into the role of miRNAs in PC

11:40 - 12:00 **Dennis R. Roop, PhD**

EB Research

12:15 - 1:30 **LUNCH**



Tuesday May 10—Afternoon Session

Session chair: Roger L. Kaspar, PhD

- 1:30 - 1:50 **Jiang Chen, MD**
Cell-to-cell adhesion relative to blistering
- 1:55 - 2:15 **Karen Wagner, MD**
Analgesia mediated by soluble epoxide hydrolase inhibition and epoxy fatty acid metabolites
- 2:20 - 2:40 **E. Birgitte Lane, PhD, FRSE, FMedSci**
Current research at the Institute of Medical Biology, Singapore
- 2:45 - 3:10 **BREAK**
- 3:15 - 3:25 **Campbell Stewart, MD**
The histological features of the nail plate in Pachyonychia Congenita
- 3:30 - 3:45 **Maria Irene Morasso, PhD**
PC Teeth Study
- 3:50 - 4:10 **Tycho Speaker, PhD**
Visualization of reduced sweating following FlexPad delivery of botulinum toxin
- 4:15 – 4:30 **Christopher Bunick, MD, PhD**
Defining the chemical and structural properties of human keratins using x-ray crystallography
- 6:30** **Meet in hotel lobby for bus transport to dinner**
- 7:00—9:00 **DINNER**



Wednesday May 11—Morning Session

7:00 - 8:30 **BREAKFAST**

8:30 **Welcome**

Session Chair: Eli Sprecher, MD, PhD

8:45 - 9:15 **Peter Hein, MD, PhD**
Clinical endpoints for pain

9:20 - 9:45 **Michael Polydefkis, MD**
Quantitative analysis of cutaneous neuroanatomy in PC patients

9:50 - 10:15 **Alain Hovnanian, MD, PhD**
Topical sirolimus for Olmsted Syndrome

10:20 - 10:40 **BREAK**

10:45 - 11:05 **Edel O'Toole, MD, PhD, FRCPI, FRCP**
Proposed clinical trials for PC

11:10 - 11:30 **Ofir Artzi, MD**
Proposed clinical trial using botulinum toxin for PC; Laser assisted drug delivery

11:35 - 12:05 **Albert Bravo, DPM, C. David Hansen, MD, Frances J.D. Smith, PhD**
Nail removal as a PC treatment

12:10 - 12:30 **International Pachyonychia Congenita Research Registry (IPCRR)**
Ready! Set! Go!

Together we truly can make a difference for those with PC!



International PC Consortium

- Ask Us About
- *Data Access*
 - *Patient Referrals*
 - *Physician Referrals*
 - *Publications*
 - *Quarterly Newsletter*
 - *Sample Access*
 - *Grants*

International PC Research Registry

- Ask Us About
- *Clinical Studies*
 - *Clinical Trials*
 - *Fact Based Data*
 - *Free Genetic Testing*
 - *Publications*
 - *Questionnaire and Images*
 - *Support Services for Patients or Physicians*





Ofir Artzi, MD is an internationally renowned expert in the field of lasers and aesthetic dermatology. After graduating from the Faculty of Medicine at the Technion in Haifa, Israel, he specialized in dermatology at Tel Hashomer Medical Center. He gained unique expertise among the leading laser centers in the US and Europe, focusing on scar prevention and remodeling. Today, he heads the Center for Aesthetic Dermatology at the Department of Dermatology, Tel Aviv Medical Center which is at the forefront of treatment, teaching and research in aesthetic dermatology. He is a member of many national and international dermatological and cosmetic professional associations, participates in many professional forums and has been honored as a guest speaker at numerous national and international aesthetic and dermatologic conferences.



Andreas Berroth, PhD studied Biotechnology at Hochschule Furtwangen University in Germany from 2005 to 2009. He received his PhD (Biology) from the Christian-Albrecht-Universität zu Kiel while doing his research about the influence of fibroblasts in the pathogenesis of atopic dermatitis at the “Dermatological Skin Care” lab at Beiersdorf AG. Since August 2014 he has been a Pachyonychia Congenita Postdoctoral Research Fellow in the lab of Christopher Contag, Stanford University. His main focus is on the influence of microRNAs on the pathogenesis of Pachyonychia Congenita.



Albert A. Bravo, DPM is a board certified podiatrist with a private practice in Massachusetts. He received his undergraduate education from Cornell University in 1980. He attended medical school at Temple University School of Podiatric Medicine graduating in 1984. His residency was at Rolling Hills Hospital, Elkins Park PA. He has received board certifications from the American Board of Podiatric Surgery and the American Board of Podiatric Medicine. He is associated with the American Podiatric Medical Association, Massachusetts Podiatric Medical Association and the American College of Foot and Ankle Surgeons.



Silviu Brill, MD is Director for Pain Medicine at the Tel Aviv Medical Center, Israel. He is a specialist in anesthesiology and pain management. He is the President of the Israeli Pain Assoc. and co-chair of the Scientific Council Pain Residency Exam, Scientific Council and Israel Medical Assoc. He is a member of the Int'l Assoc. for Pain study, American Society for Regional Anesthesia, Israel Medical Assoc. and Israeli Society of Anesthesiology.



Christopher G. Bunick, MD, PhD is Assistant Professor of Dermatology at Yale University who specializes in determining the three-dimensional atomic resolution structures of proteins involved in normal and diseased skin. He recently determined the x-ray crystal structures of the N-terminus of human profilaggrin and the keratin 1-2B/keratin 10-2B heterocomplex. His overarching research goal is to correlate protein structure with function in human skin in order to better understand skin disease.



Jiang Chen, MD is an Associate Professor in the Departments of Pathology and Dermatology of Stony Brook University School of Medicine. His research is focused on the biological functions of primary cilia and cilia-related genes in skin morphogenesis and homeostasis, and skin cancers. Specific research topics include polarity, intracellular trafficking, adhesion, and molecular signaling. His laboratory has a long-term interest in the development of mouse models and keratinocyte stem cell-based therapies for keratin skin disorders, including Pachyonychia Congenita (PC).



Pierre A. Coulombe, PhD has served since 2008 as the E.V. McCollum Professor and Chair of the Biochemistry and Molecular Biology at the Bloomberg School of Public Health at Johns Hopkins University. A native of Montréal, Québec, Canada, he received a BS degree in 1982 in experimental biology and a PhD in Pharmacology in 1987, both from the Université du Québec à Montréal (Canada). He pursued postdoctoral training from 1988 to 1992 at the University of Chicago. He was recruited to the faculty at Johns Hopkins University School of Medicine in 1992, where he remained primarily affiliated until assuming his current position. He has a continuing research interest in defining the properties, regulation and function of keratin intermediate filament proteins. He played key roles in the identification of the first intermediate filament-based disease, in defining the structural support function of keratin filaments in epithelial cells, and the discovery and characterization of novel, non-mechanical functions for keratin proteins. He has been very active in graduate education and has held several leadership positions received many awards.



C. David Hansen, MD is a dermatologist with a practice focused on the treatment of general dermatology. He has a particular emphasis in the management of acne, eczema, psoriasis, and skin cancer. After 20 years in private practice, he joined the University of Utah School of Medicine faculty full-time in 1998. His research interests are in genetic skin disorders including Pachyonychia Congenita. He is board certified in dermatology.





Peter Hein, MD, PhD is a board-certified pharmacologist and toxicologist working as a Clinical Project Lead at Grünenthal GmbH, Aachen, Germany. He obtained his MD in 2002 from the University Essen and his PhD in molecular pharmacology in 2007 from the University of Würzburg. From 2007 to 2009, he was a postdoctoral scholar at the University of California in San Francisco, followed by a position as an independent group leader in the Department of Pharmacology at the University of Cologne, Germany. In 2011 he joined Grünenthal as a Clinical Trial Physician and Translational Lead in Global Early Clinical Development.



Alain A. Hovnanian, MD, PhD is Professor of Medical Genetics and Director of an INSERM department (U781) on Genetic skin diseases: molecular bases and therapeutic approaches at the Necker Enfants Malades Hospital in Paris, France. He qualified in Medicine in 1983 and trained in Dermatology and Genetics. From 1994 to 2000, he headed a research group on inherited skin diseases at Oxford University. In 2000, he moved to Toulouse where he became full professor and headed an INSERM department on Functional Genetics of Epithelial diseases. The focus of his group is the genetic investigation and treatment of severe inherited skin disorders. He identified the gene for recessive dystrophic epidermolysis bullosa (RDEB) in 1993 and his group has since developed the molecular diagnosis and scientific tools to develop ex vivo gene therapy for RDEB.



Michelle L. Kerns, MD is a post-doctoral fellow in the laboratory of Pierre Couombe at the Johns Hopkins Bloomberg School of Public Health. She obtained her MD and is pursuing a residency in surgery at the University of Maryland School of Medicine. She is currently investigating the role of oxidative stress in the development of palmoplantar keratoderma lesions in individuals with PC to devise novel therapies for this debilitating disease. Since 2004, she has been affiliated with the Couombe lab studying keratin-based disorders – as a research technician, later as a medical student, and now as a resident. Her career goal is to continue to be active at the interface between basic science research and clinical medicine.



Roger L. Kaspar, PhD is CEO and scientific founder of TranDerm, a company focused on developing novel therapeutics, including inhibitors based on RNA interference (RNAi) technology, for skin disorders. He received his doctorate from the University of Washington (Seattle) in biochemistry and performed post-doctoral work at M.I.T. (Lee Gehrke), Stanford University (Helen Blau), and Chiba University (Tomohito Kakegawa). After serving on the faculty at Brigham Young Univer-



sity (Utah) in the Department of Chemistry and Biochemistry, he left academia to work at SomaGenics, prior to founding TransDerm. He maintains strong academic ties and has been a consulting professor at Stanford University. Drawing on his expertise in the area of post-transcriptional gene regulation, his current efforts are focused on designing highly potent and selective therapeutic siRNAs that target disease-causing genes in skin disorders, and investigating methods to efficiently deliver agents such as siRNAs to appropriate skin cells in a patient-friendly manner.

E. Birgitte Lane, PhD, FRSE, FMedSci is Executive Director of the Institute of Medical Biology, Singapore, an A*STAR government-funded research institute, and Director of the Skin Biology Cluster platform of the Biomedical Research Council of Singapore. She did her BSc and PhD at University College London (UCL) and postdoctoral work at UCL, Cold Spring Harbor Laboratory and Imperial College London before setting up her research group at ICRF (now Cancer Research UK) in London and ICRF Clare Hall Laboratories. From 1990-2009 she worked at the University of Dundee, holding the Cox Chair of Anatomy and Cell Biology from 1991. She joined A*STAR in Singapore in 2005 on secondment from Dundee and became Executive Director of the Institute of Medical Biology in 2007. Birgit is a Fellow of the Royal Society of Edinburgh and of the UK's Academy of Medical Sciences, and holds adjunct/ honorary appointments at Dundee, Karolinska Institute, the National University of Singapore and the National Skin Centre, Singapore. She has supervised 25 PhD students and published more than 230 papers.



Catherine Pei-ju Lu, PhD was born in Taiwan and completed an undergraduate degree with honors at National Taiwan University. She received a PhD degree at Skirball Institute at NY University Langone Medical Center where she discovered mechanisms by which mutations in V(D)J recombinase cause immune deficiency in patients. She joined Dr. Elaine Fuchs' laboratory at Rockefeller University for postdoctoral training in skin biology. Her research focuses on signaling required for sweat gland fate specification and development.



Maria I. Morasso, PhD received her PhD in Biochemistry from the Venezuelan Institute of Scientific Investigation (IVIC). She started at the NIH as a post-doctoral fellow in the laboratory of Dr. Thomas Sargent in NICHD. In May 2000, she became a tenure-track investigator and headed the Developmental Skin Biology Unit. Since May 2008, Dr. Morasso is the Chief of the Laboratory of Skin Biology. She also serves as an adjunct investigator in the Center for Cancer Research, NCI.





Edell A. O'Toole, MD, PhD, FRCPI, FRCP obtained her medical degree at University College Galway and subsequently trained in Medicine and Dermatology in Galway and Dublin, Ireland. She acquired expertise in keratinocyte biology at Northwestern University, Chicago, where she was a Dermatology Foundation and then a Howard Hughes Medical Institute Physician Post-doctoral Fellow with David Woodley from 1994-1998. She relocated to London in 1998 to complete her residency training in Dermatology and became a Senior Lecturer in the Centre for Cutaneous Research at Barts and the London School of Medicine and Dentistry in 2001. She was promoted to full Professor of Molecular Dermatology in 2008. She was Chair of the British Society for Investigative Dermatology from 2009-2011 and was awarded the Parkes-Weber medal by the Royal College of Physicians (London) in 2012. She has diverse research interests including keratinocyte and cancer biology, the basement membrane zone, genetic skin diseases and stem cells.



Michael J. Polydefkis, MD focuses on neuromuscular diseases, particularly peripheral nerve diseases especially in diabetic and HIV-associated peripheral neuropathy. His expertise includes nerve conduction studies, electromyography and nerve, skin and muscle biopsy reading. He received his medical degree from The Johns Hopkins University School of Medicine. He then became a Howard Hughes Medical Institute research fellow before returning to Johns Hopkins to complete an internship and residency in internal medicine, residency in neurology and a fellowship in neuromuscular diseases.



Laure Rittié, PhD became a Research Assistant Professor in the Dept of Dermatology Photoaging and Aging Research Program at the University of Michigan in Ann Arbor in 2012. She received her MS in Cell Biology in 1996 and her PhD in Biochemistry and Molecular Biology from the Université de Reims Champagne-Ardenne, France in 2001. She received postdoctoral training at the Université de Reims Champagne, France Dept of Biochemistry and at the University of Michigan, Dept of Dermatology. She was recruited to join the Dermatology Dept faculty in 2006.



Dennis R. Roop, PhD is the Charles C. Gates Chair and Director of the Center for Regenerative Medicine and Stem Cell Biology and Professor of Dermatology at the University of Colorado School of Medicine. He received a BA degree in Biology from Berea College and a MS and PhD in Microbiology from the University of Tennessee. He was a postdoctoral fellow with Dr. Bert O'Malley at Baylor College of Medicine from 1977 to



1980. Subsequently, he joined the laboratory of Dr. Stuart Yuspa at the National Cancer Institute, National Institutes of Health, Bethesda, MD, where he rose to the rank of Senior Investigator. In 1988, he was recruited back to Baylor College of Medicine, where he held the positions of Professor of Molecular and Cellular Biology and Dermatology and Director of the Center for Cutaneous Molecular Biology until he was recruited to his current position in Colorado in 2007. He has served on the Advisory Council at the NIH/NIAMS and he is a former President of the Society for Investigative Dermatology. His laboratory has had a long-standing interest in epidermal stem cells, the role that they play in inherited skin diseases and the potential isolation and correction of defective epidermal stem cells and their use as autologous grafts to treat patients with these diseases. More recently, his research has focused on induced pluripotent stem cells (iPSCs). His laboratory is currently generating iPSCs from patients with inherited skin diseases using methods which do not require viral vectors, and determining whether zinc finger nucleases can be used to correct the genetic defect in these patient-specific iPSCs.

Frances J.D. Smith, PhD is Chief Scientific Officer of PC Project. She completed her PhD jointly at the University of Edinburgh and the University of Dundee, entitled “Studies of the Molecular Basis of Epidermolysis Bullosa Simplex”. Following postdoctoral work at the University of Dundee, she held an Assistant Professorship at Thomas Jefferson University returning to the University of Dundee in 1998 until 2015. Dr Smith’s research interests have continued to focus on the molecular basis of human keratinizing disorders, and in particular, she has identified the causative genes underlying a number of these genetic diseases including the discovery of the first filaggrin mutations in ichthyosis vulgaris and atopic dermatitis. She runs the genetic testing service for Pachyonychia Congenita (PC) and is involved in various projects to develop therapeutics for PC and other keratin disorders. She started as Chief Scientific Officer of PC Project in Oct 2015 to oversee scientific efforts including research projects, publications and genetic testing.



Tycho J. Speaker, PhD is a Senior Scientist at TransDerm Inc., where he leads the microneedle delivery program. TransDerm develops RNAi therapeutics and delivery systems for treatment of genetic skin disorders. While at TransDerm, he has been instrumental in developing TransDerm’s soluble polymer microneedle technology and applications in RNAi delivery as well as Gates Foundation funded work involving skin-based vaccination. He received his PhD in physical chemistry specializing in photochemistry at the University of California, Santa Cruz in 1996, gaining a variety of fabrication and microelectronics skills under Dr. Roger Anderson. Subsequently he held senior engineering positions in semiconductor manufac-



turing environments at Applied Materials and Xerox PARC spin-off companies AKT and dpiX for nearly a decade. In 2004, he left semiconductors and started his own company, Capsulent, to commercialize a microencapsulation technology for pharmaceutical skin delivery. He became involved in TransDerm's work initially as a consultant before formally joining the company in 2009. He holds multiple patents and patent applications for pharmaceutical delivery systems.



Vu Van Quang, MD is a member of the medical staff in Pediatrics, Haiphong University of Medicine and Pharmacy; Head of Pediatric department, Green International Hospital, Haiphong, Vietnam. He has referred cases to the International PC Research Register. PC Project is pleased to sponsor Vu Van Quang for this 13th Annual International Pachyonychia Congenita Consortium.



Eli Sprecher, MD PhD immigrated to Israel from Belgium. He received his MD degree from Hadassah Medical School and completed a PhD thesis in Molecular Virology at the Hebrew University in Jerusalem. He trained in dermatology at the Rambam Medical Center, Haifa, Israel. He then spent a post-doctoral fellowship at Thomas Jefferson University, Philadelphia, PA and moved back to the department of Dermatology at the Rambam Medical Center where he was appointed senior physician and director of the Laboratory of Molecular Dermatology in 2002. In 2007, he was appointed deputy director of the Rappaport Institute for Medical Sciences, Technion, Haifa, Israel and in 2007 he established within the same institute the Rappaport-Rambam Center for Translational Genetics. In 2008, he became chair of the Department of Dermatology at the Tel Aviv Sourasky Medical Center. He also serves as Professor of Dermatology at the Sackler Medical School, Tel Aviv University. His research deals with the molecular genetics of inherited and acquired skin diseases.



Campbell L. Stewart, MD graduated from Colgate University in 2001 with a degree in cellular neuroscience with distinction. He attended the University of Vermont College of Medicine, graduating in 2009 as a member of both the Alpha Omega Alpha Honor Society and the Gold Humanism Honor Society. He completed his medical training in dermatology and dermatopathology at the Hospital of the University of Pennsylvania in Philadelphia. There he developed an interest in treating patients with complex medical dermatologic conditions and providing care to the underserved. He moved to the Seattle area in June 2014 and joined Lake Washington Dermatology in July 2014. He is married and is an animal lover, with



two energetic beagles. He enjoys the outdoors and takes advantage of the outstanding natural beauty of the Pacific Northwest.

Karen Wagner, PhD has a PhD in pharmacology and uses mass spectrometry methods, pharmacokinetics for small molecule inhibitors, and *in vivo* animals models to investigate the neurobiology of lipid metabolites. Her current research investigates the biology of bioactive lipids formed in the cytochrome P450 branch of the arachidonic acid cascade. Her goal with this research investigating lipid signaling in chronic pain disorders is to positively impact human health.



COLLABORATION

is not about gluing together existing egos.

It's about the ideas that never existed
until after everyone entered the room.

Fighting for a cure.

Connecting & helping patients.

Empowering research.



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sponsored by

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