7th
COLORADO ALPHAHERPESVIRUS LATENCY SYMPOSIUM

Vail, Colorado

May 17-20, 2017

to convene researchers active in alphaherpesvirus latency
to discuss current advances in a relaxed venue

Dear Colleagues,

It is with great pleasure that I welcome you to the 7th symposium of the Colorado Alphaherpesvirus Latency Society. Each year since 2011, we have assembled to discuss current advances in alphaherpesvirus latency in the relaxed setting of this quiet mountain community. The Christiania Lodge is again graciously providing our accommodations and please take time to thank our host. CALS' success is a tribute to the continued collaboration of individuals from around the world with the common goal of eradicating disease produced by alphaherpesvirus reactivation through understanding the molecular mechanisms underlying establishment, maintenance and reactivation from latency.

This year 70 investigators, who have authored over 2473 PubMed listed publications involving herpesvirology, have traveled 110,408 miles (3 continents, 6 countries, 22 states) to attend the two day symposium consisting of 26 oral presentations by established investigators who will discuss advances in HSV-1, HSV-2, VZV, BHV and SVV latency research. We will also hear 2-minute oral summaries of 18 posters presented by promising graduate students and postdocs. This year we are hosting a select group of exceptional undergrads whose interest in herpesvirology is just beginning. Please take time to encourage this next generation of alphaherpesvirologists. Also we are grateful to Dan Carr and Kip Kinchington who volunteered to host a special session discussion of how an NIH study section works. This informative conversation provides a unique inside view of the critical elements to a successful grant application. Lunch will be provided for those who have preregistered.

This year marks the beginning of the Don Gilden Memorial Lectureship, a grassroots endeavor initiated and generously funded by fellow alphaherpesvirologists who wish to continue Don's desire to spotlight an expert neuroscientist outside virology to help broaden our knowledge base. This year's lecture will be presented by Paola Sandroni from the Mayo Clinic who will present an overview of disorders of the autonomic nervous system. Afterwards, we will withdraw to the fireplace room for a brief musical tribute by Tamara Goldstein and Mila Khmeleva, Don's longtime friends and accompanists. No violin, but the piano duet will be memorable.

As tradition goes, we will end with our Friday Night Fireside Chat, a special time to discuss topics not addressed in formal presentations.

We have a few items to cover during the Business Meeting, and we will have the chance to do 'group science' but you have to be there to understand.

Funding for this conference was made possible (in part) by the renewal of our NIH R13 from the NIA (R13AG046051), and the charitable contributions from Calibrate, Inc., Colorado Mountain express, FedEx store #2004, Harvard Bioscience, Integrated DNA Technologies, Multichannel Systems, Rocky Mountain SIMS, Thermo Fisher Scientific, Tivoli Distributing Company, VWR, The VZV Foundation, Walmart store #4288 and our hosts, The Tivoli Lodge and The Christiania Lodge with special personal donations from Nicholas Baird, Marius Birlea, Dan Carr, Leonardo D'Aiuto, Don Gilden, Randall Cohrs, Thomas Goodwin, Luis Schang and Hua Zhu.

A special thank you goes to TEAM CALS: to the trio who keeps the meeting moving, Addilynn Beach, Christina Como and Bridget Sanford; to Julianna Pieknik who stepped forward to arrange carpools; and to Nick Beard who did the lion's share of everything you see.

Finally, as the years pass, I have seen this diverse group of outstanding individuals become a caring family, supporting each other and welcoming newcomers. As someone said, "You are known by your science, but remembered by your humanity."

Enjoy CALS 2017

Colorado Alphaherpesvirus Latency Symposium

May 17-20, 2017

Christiania Lodge
Vail, Colorado

Wednesday, May 17

7:00 pm	dinner; Christiania Lodge

Thursday, May 18

7:00 – 8:00 am	breakfast & poster set up, Christiania Lodge
8:00 – 8:10 am	welcome: Randy Cohrs
8:10 – 10:10 am	Session I: Clinical
10:10 – 10:30 am	break
10:30 – 12:30 pm	Session II: Immune Response
12:30 – 3:15 pm	lunch option 1: on your own (no meal provided) option 2: “How an NIH study section works” (lunch provided if pre-registered)
3:00 – 4:00 pm	Session III: Latency in Autonomic Ganglia
4:00 – 5:15 pm	Don Gilden Memorial Lectureship presented by Paola Sandroni introductions by Anne Gershon and Andrea Bertke
5:15 – 6:30 pm	music by Tamara Goldstein and Mila Khmeleva; Christiania Lodge
6:45 pm	group photograph
7:00 pm	dinner; Alpenrose

Friday, May 19

7:00 – 8:00 am	breakfast; Christiania Lodge
8:00 – 8:10 am	comments: Randy Cohrs
8:10 – 10:10 am	Session IV: Mechanisms
10:10 – 10:30 am	break
10:30 – 12:10 pm	Session V: Models
12:10 – 2:30 pm	lunch & business meeting; Christiania Lodge
2:30 – 5:00 pm	Session VI: Poster presentations
2:30 – 3:15 pm	Oral overview
3:15 – 5:00 pm	Poster viewing
7:00 pm	dinner; Up The Creek
following dinner	round table discussion; Christiania Lodge, fireplace room

Saturday, May 20

7:00 am	breakfast; Christiania Lodge

Don Gilden Memorial Lectureship

2017 Lecturer
Paola Sandroni, M.D., Ph.D.

Dr. Sandroni's main research focus is autonomic disorders, specifically pure autonomic failure, autoimmune autonomic neuropathies, postural tachycardia syndrome and multiple system atrophy where she has characterized and described the natural history of these disorders, assessed quality of life for patients with these conditions, identified predictors of good versus poor outcome and conducted therapeutic trials to control most disabling symptoms. Dr. Sandroni is also interested in pain syndromes. She has studied extensively complex regional pain syndromes (and planning more studies), participated in a multicenter trial to test a new medication for patients with post herpetic neuralgia and is actively involved in neuromodulation particularly for refractory central pain syndromes. She is very active in clinical practice, and also chair of her department; she is chair of the autonomic division and director of the autonomic disorders fellowship. She enjoys traveling and has been lecturing all over the globe.

Don Gilden, M.D. (1937 – 2016)
Don Gilden received his BA from Dartmouth College and his M.D. from the University of Maryland, completed Neurology residency at the University of Chicago and postdoctoral fellowship in neurovirology at Johns Hopkins. He was Professor of Neurology at the University of Pennsylvania and the Wistar Institute before moving to Colorado where he served as Professor of Neurology and Microbiology, as well as Chairman of the Department of Neurology at the University of Colorado School of Medicine for more than 24 years. Don published over 450 papers, reviews and chapters and had NIH funding continuously. He received many distinctions including the Alumni Award for Distinguished Service from the University of Chicago School of Medicine, the Pioneer Award of the International Society for NeuroVirology, the Honor Award and Gold Key for outstanding contributions to medicine and distinguished service to mankind from the University of Maryland School of Medicine, and the Drexel University College of Medicine Hilary Koprowski Prize in Neurovirology. He was elected to the Association of American Physicians, the Fellowship in the American Association for the Advancement of Science, and the Johns Hopkins Society of Scholars. Don was a superb clinician, outstanding teacher and effective administrator. Don's passion for science and medicine was second only to his love for his wife, Audrey, and family. Don will always be remembered as a supportive mentor, friend to all and the "heart of CALS."

Lectureship supporters

Ann Arvin
Nicholas Baird
Marius Birlea
John Blaho
David Bloom
Edouard Cantin
Donald Coen
Elisabeth Cohen
Randall Cohrs
Leonardo D'Aiuto
Lynn Enquist
Anne & Mike Gershon
Thomas Kristie
Todd Margolis
Satish Mehta
Duane Pierson
Rozanne Sandri-Goldin
Nancy Sawtell
Luis Schang
Deepak Shukla
Padma Srikanth
Vaibhav Tiwari
Hua Zhu

Thursday morning, May 18

7:00 breakfast & poster setup; Christiania Lodge

8:00 welcome: Randy Cohrs

Session I: Clinical. Moderator: Charles Grose

8:10 Marius Birlea
Alphaherpesviruses reactivation and headache

8:30 Edouard Cantin
Bacteriodes fragillis polysaccharide A (PSA) immunomodulation of host immunity prevents HSV1 encephalitis (HSE)

8:50 Patrick Stuart
Role of costimulatory molecules in herpetic eye disease

9:10 Richard Thompson
Long term HSV-1 latent infection in the CNS of targeted huApoE4 allele knock in mice results in cognitive impairment

9:30 Nancy Sawtell
Animal model studies to move beyond correlation: strengthening the link between HSV and Alzheimer's

9:50 Ruth Itzhaki
The case for a major role of the virus herpes simplex type 1 in Alzheimer's disease

10:10 coffee break

Session II: Immune Response. Moderator: Stacey Efstathiou

10:30 Charles Grose
Cellular stress response to varicella-zoster virus infection includes elevated transcription of interleukin-6

10:50 Tao Peng
Keratinocytes produce IL-17c to protect peripheral nervous systems during human herpes simplex virus type 2 reactivation

11:10 Matthew Taylor
Effect of type 1 interferon signaling on alphaherpesvirus coinfection and neuronal spread

11:30 David Davido
Inhibition of viral DNA replication limits the efficacy of an HSV-1 neuro-attenuated vaccine in mice

11:50 Dan Carr
Phase I clinical trial of a live HSV-2 ICP0^{-} virus as a therapeutic vaccine for genital herpes

12:10 Bill Jacobs
The key role of antibodies that mediate antibody dependent cell-mediated cytotoxicity and phagocytosis for protection in mice and guinea pigs for HSV-1 and HSV-2

Thursday afternoon, May 18

12:30 lunch
option 1: on your own (no lunch provided)
option 2: “How an NIH study section works” (lunch provided if pre-registered)
Moderators: Dan Carr and Paul “Kip” Kinchington

Session III: Latency in Autonomic Ganglia. Moderator: Andrea Bertke

3:00 Andrea Bertke
HSV1 and HSV2 reactivation in different types of neurons

3:20 Mike Gershon
VZV in the ENS

3:40 Georges Verjans
VZV latency revisited: identification and characterization of the VZV latency transcript

4:00 **Don Gilden Memorial Lectureship presented by Paola Sandroni**
Autonomic disorders: a brief physiopathologic overview
introductions by Anne Gershon and Andrea Bertke

5:15 music by Tamara Goldstein and Mila Khmeleva

6:45 group photograph

7:00 dinner; Alpenrose

Friday morning, May 19

7:00 breakfast; Christiania Lodge

8:00 comments: Randy Cohrs

Session IV: Mechanisms. Moderator: Luis Schang

8:10 Victor Hsia
Participation of thyroid hormone in the regulation of VZV reactivation and replication

8:30 Clinton Jones
Regulation of the canonical Wnt/β-catenin signaling pathway during the bovine herpesvirus 1 latency-reactivation cycle

8:50 Ron Goldstein
VZV expresses short non-coding RNAs including a potential miRNA

9:10 Patrick Lomonte
Promyelocytic leukemia (PML) nuclear bodies are essential for latent HSV-1 genome chromatinization through a PML/histone H3.3/H3.3 chaperones axis

9:30 Anna Cliffe
Stress-induced changes to HSV-1 chromatin during reactivation

9:50 Seth Frietze
CTCF occupancy on HSV-1 and VZV DNA in human trigeminal ganglia

10:10 coffee break

Session V: Models. Moderator: Todd Margolis

10:30 Moriah Szpara
Father-to-son transmission of herpes simplex virus results in near-perfect preservation of viral genome identity and *in vitro* phenotypes

10:50 Homayon Ghiasi
Role of HVEM ligands on HSV-1 latency-reactivation

11:10 Katherine Lee
Varicella-zoster virus (VZV) infection of ARPE-19 cells as an *in vitro* model of VZV-induced uveitis

11:30 Susanne Himmelein
Is there a role of TLRs during latent HSV-1 infection in the human TG?

11:50 Vicki Traina-Dorge
Reactivation of simian varicella virus (SVV) in Rhesus Macaques following CD4 T lymphocyte depletion

12:10 lunch & business meeting; Christiania Lodge

Friday afternoon, May 19

Session VI: Poster presentations. Moderators: Martine Aubert & David Davido

2:30 Oral overviews

Poster 1 Werner Ouwendijk
Varicellavirus infection of the enteric nervous system

Poster 2 Anna Blackmon
Varicella zoster virus causes redistribution of claudin-1 and aberrant expression of E-cadherin and N-cadherin in human perineurial cells

Poster 3 Andrew Bubak
Dissecting mechanisms of postherpetic neuralgia using a simian varicella virus model

Poster 4 Xiaomi Chen
Varicella zoster virus (VZV) establishes latency in human enteric neurons

Poster 5 Leonardo D'Aiuto
Human three-dimensional neuronal platforms for drug screening

Poster 6 Chiharu Graybill
Cell-associated vOka and rOka strains of varicella-zoster virus (VZV) inhibit autophagic flux

Poster 7 Ian Hogue
Pseudorabies virus egress and spread uses constitutive secretory mechanisms and does not depend on action potential firing in neurons

Poster 8 Dallas Jones
A human model for VZV vasculopathy using cadaveric cerebral, aortic and pulmonary arteries *ex vivo*

Poster 9 Yoshiki Kawamura
Mutations of herpes simplex virus 2 latency-associated transcript (LAT) – associated micro RNAs, LAT promoter, and ICP4-biding site don't control herpes simplex virus species phenotypes: reactivation in the guinea pig genital model

Poster 10 Gang Li
HSV-1 microRNA miR-H5-5p targets the viral protein kinase US3

Poster 11 Dane Phelan
In vivo knock-down of the herpes simplex virus type 1 latency-associated transcript reduces reactivation from latency

Poster 12 Julianna Pieknik
HSV-2 reactivates from autonomic neurons *in vivo*

Poster 13 Rebecca Powell-Doherty
Amyloid-β and p-Tau anti-threat response to HSV-1 infection in a murine model of primary adult hippocampal neurons

Poster 14 Julian Scherer
Complex of three envelope proteins mediates anterograde transport and spread

Poster 15 Benjmain Warner
A growth conditional varicella-zoster virus for study in the rat pain model of post-herpetic neuralgia

Poster 16 Shannan Washington
CTCF depletion in the neuron results in *in vivo* reactivation in rabbits latent with HSV-1

Poster 17 Qiaojuan Zhang
Regulation of T-type Ca^{2+} channels expression by herpes simplex virus-1 infection in trigeminal ganglia sensory neuron-like ND7-23 cells

Poster 18 Nicholas Taylor
Lexicon of alphaherpesvirus latency: the words used by students, experts, and authors

3:15 Poster viewing

7:00 dinner; Up The Creek

following dinner - round table discussion (optional); Christiania Lodge, fireplace room

Saturday morning, May 20

7:00 breakfast; Christiania Lodge

departure

Discussants

Martine Aubert
Nicholas Baird
Addilynn Beach
Charles Calisher
Randall Cohrs
Christina Como
Jane Dantinne
Stacey Efstathiou
Anne Gershon
Tom Goodwin
Ken Jones
Peter Kennedy
Kamel Khalili
Paul R (Kip) Kinchington
Carol Kulesza
Ravi Mahalingam
Todd Margolis
Satish Mehta
Maria Nagel
Klaus Osterrieder
Duane L. Pierson
Aaron Prattis
Victoria Quintana
Mercedes Romero
Bridget Sanford
Luis Schang
Scott Schmid
Hua Zhu

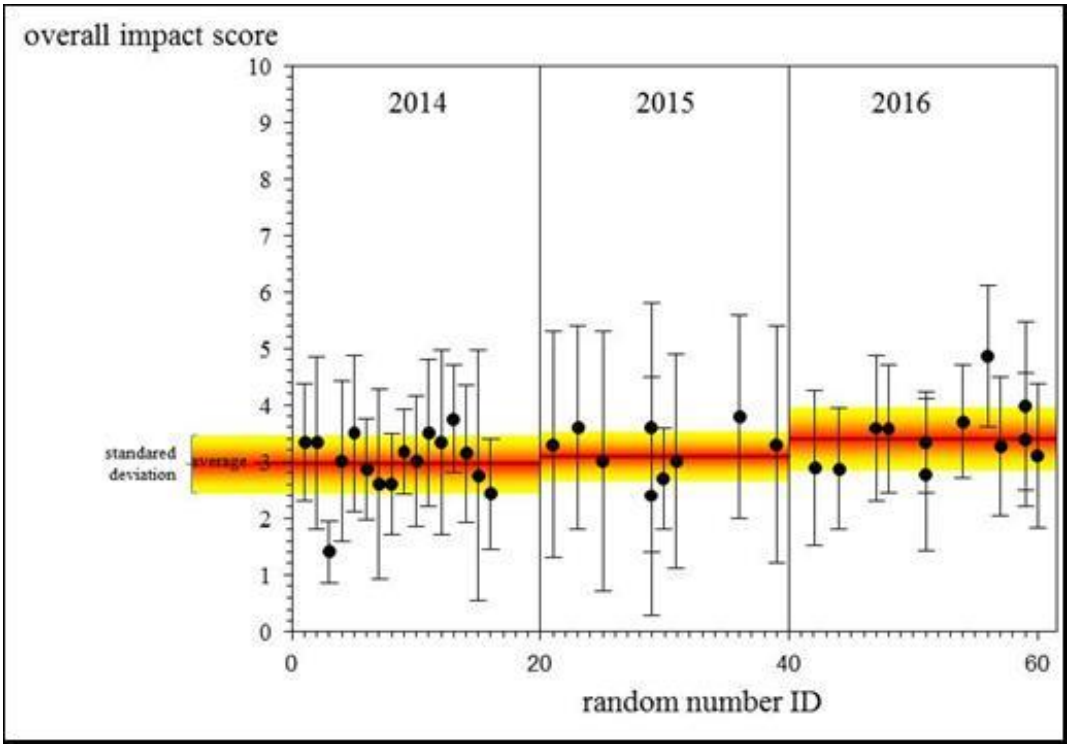
7th COLORADO ALPHAHERPESVIRUS LATENCY SYMPOSIUM

poster session

Dear Colleagues,

As part of CALS' mentorship program, we provide graduate students and postdoctoral fellows concrete advice concerning their projects. The NIAID program officer suggested that the most important item is the **overall impact score**. This score reflects the likelihood for the project to exert a sustained, powerful influence on the research field and takes into account the project's *approach, significance and innovation*. The NIH also requests reviewers use the full scale (1=best, 10= not so) when submitting their integer score. This was done for each poster presenter over the past 3 years and prudent use of Excel's random number generator permitted all steps to be **anonymous** (figure below). As you can see, we are getting slightly better at full-range scoring (the NIH strives for an average of 5), but we seem to have a clustering effect.

Please help our poster presenters with a real-life NIH experience. For each presenter listed on the following page, please provide a realistic overall impact score and the single most important consideration that influenced your overall score. If possible, please select **one** presenter and elaborate on the reverse side of the scoring page. When completed, place the scoring page into the designated box. I type all comments so your critique is **anonymous**.



Significance. Does the project address an important problem or a critical barrier? How will scientific knowledge, technical capability, and/or clinical practice be improved? How will concepts, methods, technologies, treatments, services, or preventative interventions be changed?

Approach. Are the overall strategy, methodology, and analyses well-reasoned? Are potential problems, alternative strategies, and benchmarks for success presented?

Innovation. Does the application challenge, shift current research or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions? Are the concepts, approaches or methodologies, instrumentation, or interventions novel? Is a refinement, improvement, or new application of theoretical concepts, approaches or methodologies, instrumentation, or interventions proposed?

poster score page (please tear out and put in box after completing)

presenter	overall impact score (1-10)	comments
Anna Blackmon		
Andrew Bubak		
Xiaomi Chen		
Leonardo D'Aiuto		
Chiharu Graybill		
Ian Hogue		
Dallas Jones		
Yoshiki Kawamura		
Gang Li		
Werner Ouwendijk		
Dane Phelan		
Julianna Pieknik		
Rebecca Powell-Doherty		
Julian Scherer		
Nicholas Taylor		
Benjmain Warner		
Shannan Washington		
Qiaojuan Zhang		

We thank the following for their support of the 2017 CALS

NIA – NIH*

Calibrate, Inc
Christiania Lodge
Colorado Mountain Express
FedEx, store #2004
Harvard Bioscience
Integrated DNA Technologies
Multichannel Systems
Rocky Mountain SIMS
Thermo Fisher Scientific
Tivoli Distributing Company
Tivoli Lodge
VWR
VZV Foundation
Walmart, store #4288

Nicholas Baird
Marius Birlea
Dan Carr
Randall Cohrs
Leonardo D'Aiuto
Don Gilden
Thomas Goodwin
Luis Schang
Hua Zhu

*Funding for 2017 CALS was provided in part by R13AG046051 from the National Institute on Aging. The views expressed in written conference materials or publications and by speakers and moderators do not necessarily reflect the official policies of the Department of Health and Human Services; nor does mention of trade names, commercial practices, or organizations imply endorsement by the U.S. Government.