

9<sup>th</sup>  
**COLORADO  
ALPHAHERPESVIRUS  
LATENCY SYMPOSIUM**

Vail, Colorado

May 8-11, 2019



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

Dear Colleagues, Welcome to the 9<sup>th</sup> Symposium of the Colorado Alphaherpesvirus Latency Society.

Since 2011, we have been meeting at the end of ski season in this idyllic mountain setting to discuss advances in alphaherpesvirus latency. Each year, this meeting takes on an initial character dictated by the weather: three years we enjoyed warm sun and spring in the mountain; three years we were in coats and enjoyed crisp mornings; and one year we trudged through snow and had dinner during a blinding blizzard. Notwithstanding the weather, the presentations have always been invigorating and enlightening, and many led to collaborative works, joint publications and grant applications. As I write this, we have experienced 70°F (21°C) days interspaced with snow, sleet, hail, rain and fog; typical Spring weather. So I cannot predict the outside conditions, but inside I know our meeting will be a great time where new and old colleagues will enthusiastically talk about our scientific love – *Herpes*.

This year we again reached our attendance maximum – this time within 4 days of opening registration. The 70 investigators in attendance have published at least 2,748 PubMed cited papers on herpesviruses and together have traveled a total of 121,825 miles to enjoy 31 talks and 9 posters. Since each poster will be introduced by the author, we will hear from 40 different individuals, so I hope all will sit back and enjoy the Science.

Looking at the attendee list, we are a select group. We know more about our specialty than most others in the world. A major problem that can be encountered with such a group is the silo effect (Phil S. Ensor, 1931–2018). On a farm, a silo stores tremendous amount of similar grains. This is great. Seeds do not mix and are ideal for future use. In an organization, each individual is a silo where tremendous amounts of specialized knowledge is stored but may never mix with others in the group. A major goal of CALS is to bring together the silos in alphaherpesvirus latency and, for a time, break down the walls letting each's seed of knowledge mix to cultivate new fields with hybrid ideas whose offspring are often stronger than the parental.

It is still difficult to accept that Don left us three years ago. His legacy, the Don Gilden Memorial Lecture is a fitting tribute to his 'in & fore' sight. Our 3<sup>rd</sup> Don Gilden Memorial Lecture will be presented by Dr. Stanley Prusiner, Don's longtime friend and colleague, who will describe how host proteins can assume Prion qualities that cause neurodegeneration. It is hoped that these exciting findings may help explain the feature of herpesvirus infection that can result in cognitive decline, neurodegeneration and possibly Alzheimer's disease.

Since last we met, we have aged about a year – some more – some less. But with the passing of time, we appreciate the need to bring new individuals into our field. To this end we have extended special invitations to four undergraduates specially selected by their mentors to experience a real, live international scientific meeting. Please relate your scientific story to them – the potential future leaders in the field. Also we realize the immense importance a good mentor has on a career. To help us mentor more effectively, Kip Kinchington will hold a special session on mentoring practices to maintain effective communication. Please register for this Thursday lunch meeting at the signup sheet located at the registration table (Wednesday) or in the lecture room (Thursday morning). A \$10 fee will be collected for the lunch. There is no fee for lunch for all postdoctoral fellows and students (but their attendance is mandatory).

We have a few items to cover during the Business Meeting and a few votes to cast by the attending Program Committee members. CALS is a joint affair; if you wish to join the Program Committee, you can do so at the Business Meeting.

We end the Symposium with our traditional fireside chat. This relaxed time after Friday night's dinner is the time to discuss anything pertaining to alphaherpesvirus latency that has been bothering you, or that should bother others. It typically lasts well into the night and has become a highly anticipated time to clarify thought while enjoying liquid refreshments by the heat of a roaring (gas) fire.

Finally, I wish to thank our generous benefactors and our family of alphaherpesvirologists, both of whom are critical to the continued success of this annual symposium that is the Colorado Alphaherpesvirus Latency Society.

Enjoy CALS 2019

# Colorado Alphaherpesvirus Latency Symposium

May 8-11, 2019

Christiania Lodge  
Vail, Colorado

## Wednesday, May 8

7:00 pm dinner; Bully Ranch

## Thursday, May 9

7:00 – 8:00 am breakfast & poster set up, Christiania Lodge

8:00 – 8:20 am welcome: Randy Cohrs & Nick Baird

8:20 – 10:00 am Session I: Clinical

10:00 – 10:20 am coffee break

10:20 – 12:00 pm Session II: Epigenetics

12:00 – 2:30 pm Lunch /  
Mentoring practices to maintain effective communication (registration required)  
*presented by Kip Kinchington*  
(mandatory for Postdoctoral Fellows and Students)

2:30 – 4:10 pm Session III: Gene function

4:10 – 4:30 pm coffee break

4:30 pm Don Gilden Memorial Lectureship presented by Stanley Prusiner  
*Introduced by Charles Grose*

6:30 pm group photograph

7:00 pm dinner; Matsuhisa

## Friday, May 10

7:00 – 8:00 am breakfast; Christiania Lodge

8:00 – 8:10 am comments: Randy Cohrs & Nick Baird

8:10 – 9:50 am Session IV: Mechanism

9:50 – 10:10 am coffee break

10:10 – 12:10 pm Session V: Models

12:10 – 2:30 pm lunch & business meeting; Christiania Lodge

2:30 – 3:50 pm Session VI: Prevention

3:50 – 6:00 pm Session VII: Poster presentations

7:00 pm dinner; Up The Creek

following dinner fireside chat; Christiania Lodge, fireplace room

## Saturday, May 11

7:00 am breakfast; Christiania Lodge

# Don Gilden Memorial Lectureship

## 2019 Lecturer Stanley Prusiner, M.D.



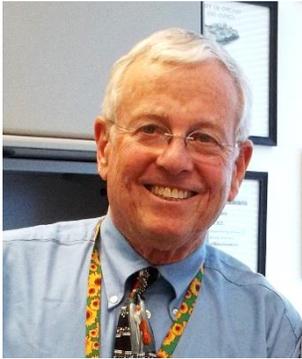
Stanley B. Prusiner is Director of the Institute for Neurodegenerative Diseases and Professor of Neurology and Biochemistry at the University of California San Francisco (UCSF). He received his B.A. in Chemistry in 1964 and his M.D. in 1968 from the University of Pennsylvania. After completing his military service as a lieutenant commander in the U.S. Public Health Service at the National Institutes of Health and his neurology residency training at UCSF, he joined the UCSF faculty in 1974 and set up a laboratory to study brain diseases.

Prusiner discovered an unprecedented class of pathogens that he named prions. Prions are proteins that acquire an alternative shape that becomes self-propagating. As prions accumulate, they cause neurodegenerative diseases in animals and humans. Prusiner's discovery led him to develop a novel disease paradigm: prions cause disorders such as Creutzfeldt-Jakob disease (CJD) in humans that manifest as (1) sporadic, (2) inherited and (3) infectious illnesses. When proposed, many scientists considered Prusiner's concept of "infectious proteins" as well as his proposal that a single protein could possess multiple biologically active shapes or conformations to be heretical. Based on his seminal discovery that prions can assemble into amyloid fibrils, Prusiner proposed that the more common neurodegenerative diseases including Alzheimer's and Parkinson's diseases may be caused by prions. Remarkably, a wealth of evidence continues to accumulate arguing that prions cause not only these common degenerative diseases, but also ALS, the frontotemporal dementias (FTDs), chronic traumatic encephalopathy (CTE) and multiple system atrophy (MSA). Much of Prusiner's current research focuses on developing therapeutics that reduce the levels of the specific prions responsible for Alzheimer's, Parkinson's, MSA, the FTDs, CTE and CJD.

Prusiner's contributions to scientific research have been internationally recognized: He is a member of the National Academy of Sciences, the National Academy of Medicine, the American Academy of Arts and Sciences and the American Philosophical Society, and a foreign member of the Royal Society, London. He is the recipient of numerous prizes, including the Potamkin Prize for Alzheimer's Disease Research from the American Academy of Neurology (1991); the Richard Lounsbery Award for Extraordinary Scientific Research in Biology and Medicine from the National Academy of Sciences (1993); the Gairdner Foundation International Award (1993); the Albert Lasker Award for Basic Medical Research (1994); the Wolf Prize in Medicine from the State of Israel (1996); the Nobel Prize in Physiology or Medicine (1997); and the United States Presidential National Medal of Science (2009).

Prusiner is the author of over 550 scientific research and 300 review articles, and editor of 13 books on diseases caused by prions. Prusiner's single-author book *Madness and Memory*, which chronicles his discovery of prions, received wide acclaim. He holds 50 issued or allowed United States patents, all of which are assigned to the University of California. He has delivered over 150 honorary and over 740 invited lectures.

## **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	Stacey Efstathiou	Lynn Enquist
Seth Frieze	Anne & Mike Gershon	Rafael Harpaz	Victor Hsia
Kip Kinchington	Thomas Kristie	Todd Margolis	Satish Mehta
Ian Mohr	Duane Pierson	Rozanne Sandri-Goldin	Nancy Sawtell
Luis Schang	Scott Schmid	Deepak Shukla	Padma Srikanth
Vaibhav Tiwari	Abel Viejo-Borbolla	Hua Zhu	

# Thursday morning, May 9

7:00 breakfast & poster setup; Christiania Lodge

8:00 welcome: Randy Cohrs & Nick Baird

## Session I: Clinical

*Moderator: Adriana Weinberg*

8:20 Todd Margolis  
HSV and VZV eye disease (the human model)

8:40 Vishwajit L Nimgaonkar  
Infection with Herpes Simplex virus type 1 (HSV-1) and sleep: the dog that did not bark

9:00 Jia Zhu  
Deciphering peripheral nerve regeneration in genital skin of human HSV-2 reactivation

9:20 Trine Mogensen  
A novel innate immunodeficiency predisposing to varicella zoster virus infection in the CNS

9:40 Maria A. Nagel  
Proviral amylin and amyloidogenic viral peptides link VZV with Alzheimer's disease

10:00 coffee break

## Session II: Epigenetics

*Moderator: Caroline Kulesza*

10:20 Patrick Lomonte  
Promyelocytic Leukemia Nuclear Bodies (PML NBs)-associated latent HSV-1 genomes are chromatinized with constitutive heterochromatin marks but not definitively silenced

10:40 Anna Cliffe  
HSV reactivation in response to neuronal hyperexcitability

11:00 Donna Neumann  
CTCF recruits cohesins to the latent HSV-1 genome

11:20 Colleen A. Mangold  
Identification of strain-specific differences in host and virus transcriptomes following neuronal infection with HSV-1

11:40 Klaus Osterrieder  
Marek's disease virus (MDV) can adopt quasispecies behavior – at the cost of increased virulence

12:00 Lunch /  
Mentoring practices to maintain effective communication (registration required)  
*presented by Kip Kinchington*  
(mandatory for Postdoctoral Fellows and Students)

# Thursday afternoon, May 9

## Session III: Gene function

*Moderator: Stacey Efstathiou*

- 2:30 Igor Jurak  
Herpes simplex virus 1 miRNA sequence variations during productive and latent infection
- 2:50 Julianna Pieknik  
*In vivo* evidence for Herpes Simplex Viruses' miRNAs role in reactivation from latency
- 3:10 Esteban A. Engel  
Latency-associated promoters from alpha-herpesvirus show long-term transgene expression in the central nervous system of mice after systemic adeno-associated virus delivery
- 3:30 David Davido  
A high-throughput assay to examine HSV-1 ICP0 transactivation function during acute infection and reactivation
- 3:50 Kip Kinchington  
VZV lacking two major virion incorporated transactivators retain efficient spread in cultured human neuron platforms and non-neuronal culture
- 4:10 coffee break
- 4:30 **Don Gilden Memorial Lectureship presented by Stanley Prusiner**  
Discovering Anti-Prion Therapeutics for Alzheimer's and Parkinson's Diseases  
*introduction by Charles Grose*
- 6:30 group photograph
- 7:00 dinner; Matsuhisa

# Friday morning, May 10

7:00 breakfast; Christiania Lodge

8:00 comments: Randy Cohrs & Nick Baird

## Session IV: Mechanism

*Moderator: Matthew Taylor*

8:10 Greg Smith  
Solving a neuroinvasive conundrum: alpha-herpesviruses employ an unusual two-step nuclear delivery program

8:30 Abel Viejo-Borbolla  
Investigation on the role of herpes simplex virus type 2 glycoprotein G in neurite outgrowth and infection of sensory neurons

8:50 Andrea Bertke  
Neurotrophic factor signaling in HSV latency and reactivation in primary adult neurons

9:10 Jeffery B. Ostler  
Activation of HSV-1 immediate-early genes by stress-induced transcription factors

9:30 Tony Huang  
Role of nuclear DNA damage in regulating HSV-1 latency

9:50 coffee break

## Session V: Models

*Moderator: Moriah Szpara*

10:10 Daniel P. Depledge  
The promise and perils of interrogating HSV-1 latency at single cell resolution

10:30 Leonardo D'Aiuto  
Modeling HSV-1-neural progenitor cell interactions

10:50 David C. Bloom  
Reactivation of HSV-1 from differentiated human neurons *in vitro* does not require an animation phase

11:10 David Knipe  
Human sensory neurons derived from iPSCs allow a stable latent infection with HSV-1 and show a novel pattern of HSV gene expression

11:30 Victor Hsia  
Modulation of Voltage Gated Sodium Channel (VGSC) activity in human dorsal root ganglion (DRG) neurons by herpesvirus quiescent infection

11:50 Edouard M Cantin  
The absence of CCR2+ inflammatory monocytes in the CNS precludes HSV reactivation

12:10 lunch & business meeting; Christiania Lodge

# Friday afternoon, May 10

## Session VI: Prevention

*Moderator: Vicki Traina-Dorge*

- 2:30 Charles Grose  
Clues about herpes zoster from children who have been vaccinated
- 2:50 Rafael Harpaz  
The impacts of varicella vaccination on the incidence of herpes zoster: beyond the hypotheses
- 3:10 Michael N. Oxman  
Recurrent herpes zoster in the shingles prevention study: are second episodes caused by the same varicella-zoster virus strain?
- 3:30 Martine Aubert  
Gene editing and elimination of Herpes Simplex Virus by meganucleases but not CRISPR/Cas9 *in vivo*

## Session VII: Poster presentations

*Moderators: David Koelle & Phil Krause*

- 3:50 Oral overviews
- Poster 1 Joshua Ames  
Potential role of ER-associated degradation in latency and reactivation of herpes simplex virus type-1
- Poster 2 Ilakkiya Arumugam  
Open reading frame 68 of Varicella zoster virus a marker of reactivation in clinical samples
- Poster 3 Andrew N. Bubak  
Simian varicella zoster virus induces amylin and an amyloidogenic environment: implications in diabetes
- Poster 4 Oscar Haigh  
Immune response to HSV-1 mutants eliciting protection against disease and the elimination of reactivation from the TG
- Poster 5 Michael Mariani  
Unraveling the higher-order chromatin structures of varicella zoster virus within the host cell nucleus: 4C-seq characterization of VZV provides evidence for stable interactions between active chromatin
- Poster 6 Christy Niemeyer  
The role of TRPV1 during VZV infection in non-neuronal cell types
- Poster 7 Océane Sorel  
Role of T cells during varicella virus dissemination
- Poster 8 Jon B. Suzich  
Interferon-dependent induction of promyelocytic leukemia nuclear bodies promotes a repressive form of HSV-1 latent infection
- Poster 9 Emilia Vanni  
Regulation of ICP34.5 protein expression by the 5' UTR elements
- 4:30 Poster viewing
- 7:00 dinner; Up The Creek
- following dinner – fireside chat; Christiania Lodge, fireplace room

# Saturday morning, May 11

7:00 breakfast; Christiania Lodge

departure

## What's with the card at the end of the program?

Please use the note card at the end of the program to jot down any questions you may have that were not addressed during the meeting; these will be read at the Friday Night Fireside Chat for open discussion. Anytime during the meeting or after the poster session, please deposit the notecard (unsigned) in the box located by the door.

## Discussants

Nicholas Baird  
John Blaho  
Gerald Bush III  
Sara Bustos Lopez  
Randy Cohrs  
Jane Dantine  
Stacey Efstathiou  
Simon Fletcher  
Seth Fietze  
Andrew Harrington  
Nadine Jarousse  
Clinton Jones  
Peter Kennedy  
David Koelle  
Phil Krause  
Caroline Kulesza  
Myron Levin  
Ravi Mahalingam  
Darrick Moore  
Preston Neff  
Faith Osinaga  
Joel Rovnak  
Scott Schmid  
Moriah Szpara  
Matthew Taylor  
Vicki Traina-Dorge  
Sierra Vigil  
Adriana Weinberg  
Angus Wilson  
Tejabhram Yadavalli

9<sup>th</sup>  
**COLORADO  
ALPHAHERPESVIRUS  
LATENCY SYMPOSIUM**

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**POSTER SESSION**

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Dear Colleagues,

As part of CALS' mentorship program, we provide graduate students and postdoctoral fellows concrete advice concerning their projects. The NIH 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.

Last year we had all attendees critique all posters, which became burdensome. This year, please select any two posters to review. Please use the following page to assign an overall impact score and write a summary statement (in short sentences or bullet form) that takes into account:

**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 strategies, methodologies, and analyses well-reasoned? Are potential problems, alternative strategies, and benchmarks for success presented?

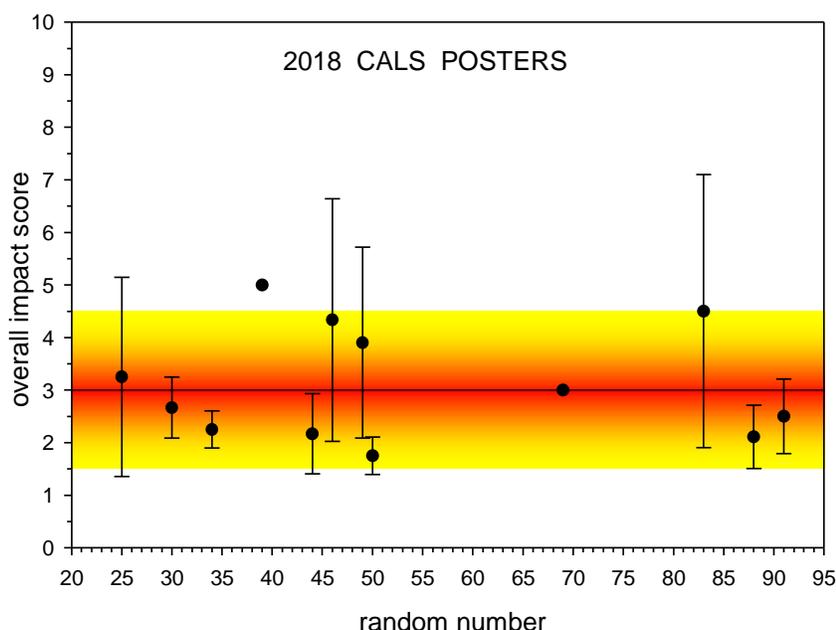
**Innovation.** Does the application challenge, shift current research or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions? Are the concepts, approaches or methodologies, instrumentation, or interventions novel? Is a refinement,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

When you are finished please tear the scoring page out of your program and deposit it in the box by the door.

**We maintain strict anonymity.** Your unsigned critiques will be transcribed and prudent use of Excel's random number generator will permit all steps to be **anonymous** - unless you follow Ed Wagner's habit of signing his manuscript reviews.

Below are the overall impact scores of last year's posters. Please take this seriously since our constructive criticism will probably influence greatly a person's professional career.

Thank you.



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

I am a/an (circle one): Investigator Postdoc Graduate student Other

presenter name: \_\_\_\_\_ overall impact score (1-10) \_\_\_\_\_  
(1=best, 10=not so)

comments:

presenter name: \_\_\_\_\_ overall impact score (1-10) \_\_\_\_\_  
(1=best, 10=not so)

comments:



**We thank the following for their  
support of the 2019 CALS**

**NIA – NIH\***

**Christiania Lodge  
Colorado Mountain Express  
FedEx, store #2004  
Harvard Bioscience  
Integrated DNA Technologies  
Rocky Mountain SIMS  
ThermoFisher Scientific  
Tivoli Lodge  
VZV Foundation**

**Randall Cohrs  
Seth Fietze  
Don Gilden  
Rob Kalejta  
Caroline Kulesza  
Todd Margolis  
Tejabhram Yadavalli**

\*Funding for the 2019 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.