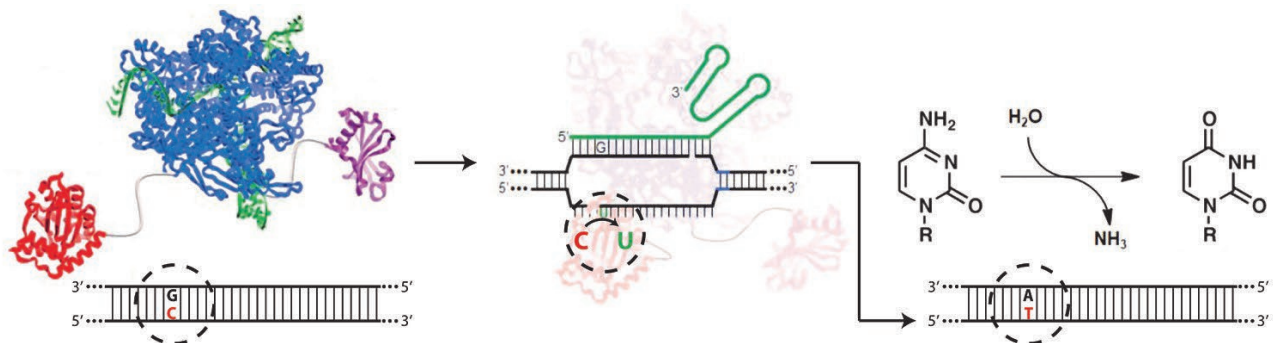


4th International Conference on Base Editing “Enzymes and Applications” Deaminet 2023

January 22nd - 24th, 2023

ALL TIMES ARE USA PACIFIC STANDARD TIME (PST)

(with virtual streaming of main sessions)



Organized by:

Rémi Buisson, University of California Irvine
Reuben Harris, University of Texas Health San Antonio, HHMI
Catriona Jamieson, University of California San Diego
Alexis Komor, University of California San Diego
Audrone Lapinaite, Arizona State University
David Liu, Broad Institute, Harvard University, HHMI
Brandon Moriarity, University of Minnesota
Matthew Weitzman, Children’s Hospital of Philadelphia

With expert assistance from:

Krystina Jarema, University of California Irvine
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SUNDAY, JANUARY 22

2:00 – 4:30 PM **REGISTRATION**

4:30 – 6:15 PM SESSION I

Convener: **Alexis Komor, University of California San Diego**

4:30 – 4:35 **Welcome Remarks - Reuben Harris, UT Health San Antonio & HHMI**

4:35 – 4:55 **Invited Speaker: David Liu**, Broad Institute, Harvard University, & HHMI, USA, “Base editing to correct mutations that cause genetic disease in cells, animals, and patients”

4:55 – 5:15 **Invited Speaker: Xue Gao**, Rice University, USA, “Engineering high-precision and multiplex base editors”

5:15 – 5:35 **Zachary Kockler**, National Institute of Environmental Health Sciences, USA, “Parallel comparison of human APOBEC exposed DNA and RNA suggests APOBEC3A as the predominant global RNA editor”

5:35 – 5:55 **Invited Speaker: John Gross**, University of California, San Francisco, USA, “Structural insights into the molecular arms race between human APOBEC3G and HIV-1 Vif”

5:55 – 6:15 **Invited Speaker: Audrey Lapinaite**, Arizona State University, USA, “Understanding molecular mechanism of current precision genome editing tools: how adenine base editors modify DNA”

6:30 – 8:00 PM **DINNER**

MONDAY, JANUARY 23

7:30 – 8:30 AM

BREAKFAST

8:30 – 9:50 AM

SESSION II

Convener:

Remi Buisson, University of California Irvine

8:30 – 8:50

Invited Speaker: Michael Lawrence, Harvard Medical School, USA, “Patterns of APOBEC mutations in cells”

8:50 – 9:10

Invited Speaker: Gaelen Hess, University of Wisconsin, Madison, USA, “Diversifying base editors for the identification of functional variants”

9:10 – 9:30

Kiara Berríos, University of Pennsylvania, USA, “Cooperativity between Cas9 and AID establishes broad and diversifying mutational footprints in base editors”

9:30 – 9:50

Herra Grajo Mendoza, University of California, Davis, USA, “Probing substrate recognition by ADAR1 using 8-azanebularine-modified RNA duplexes”

9:50 – 10:20 AM

COFFEE BREAK

10:20 – 12:20

SESSION III

Convener:

Catriona Jamieson, University of California San Diego

10:20 – 10:40

Invited Speaker: Anna Malkova, Iowa State University, USA, “Using APOBEC3A to unravel mutagenic potential of break-induced replication”

10:40 – 11:00

Invited Speaker: Waseem Qasim, University College London, UK, “Deaminated therapeutic T cells for ALL”

11:00 – 11:20

Juan Serrano, University of Pennsylvania, USA, “Structure-guided design of a potent and specific inhibitor against the genomic mutator APOBEC3A”

11:20 – 11:40

Invited Speaker: Laura Ugalde Diaz, CIEMAT, Spain, “Double strand break-free genome editing to target hematopoietic stem and progenitor cells in Fanconi anemia patients”

11:40 – 12:00

Chen Gang Goh, Cancer Research UK Cambridge Institute, UK, “Investigating topoisomerase-associated DNA damage repair with base editing mutagenesis screen in mammalian cells”

12:00 – 12:20

Fumiaki Ito, University of Southern California, USA, “Structural basis for HIV-1 antagonism of host APOBEC3G via CULLIN E3 ligase”

12:30 – 1:45 PM

LUNCH

MONDAY, JANUARY 23

2:00 – 4:00

SESSION IV

Convener: David Liu, HHMI & Broad Institute & Harvard University

2:00 – 2:20

Invited Speaker: Mark Osborn, University of Minnesota, USA,
“Base editing in primary and patient cells”

2:20 – 2:40

Invited Speaker: Abby Green, Washington University St. Louis, USA,
“Therapeutic opportunities posed by APOBEC3A activity in cancer”

2:40 – 3:00

Invited Speaker: Alan Herbert, InsideOutBio, USA,
“Flipons as a therapeutic target to regulate gene expression”

3:00 – 3:20

Sifeng Gu, University of California, San Diego, USA,
“Investigation of base editing mechanisms through CRISPRi screens”

3:20 – 3:40

Invited Speaker: David Brafman, Arizona State University, USA,
“Optimizing isogenic cell line generation with transient reporters for editing enrichment (TREE)”

3:40 – 4:00

Madelynn Whittaker, University of Pennsylvania, USA,
“Toward therapeutic base editing for tyrosinemia and phenylketonuria”

4:00 – 6:00 PM

POSTER SESSION AND RECEPTION

Ruslan Afasizhev, Boston University, USA, “The ABC of mitochondrial RNA editing in trypanosomes”

Ashley Auerbach, UT Health San Antonio, San Antonio, USA, “Ancestral APOBEC3B nuclear localization is maintained in humans and apes and altered in most other Old World primate species”

Christopher Belica, University of Minnesota, Minneapolis, USA, “Binding characterization of novel alpaca-derived APOBEC3B and APOBEC3A nanobodies”

Faezeh Borzooee, Simon Fraser University, Canada, “Simulation of AID/APOBEC3-mediated mutations on the complete immunopeptidome reveals remarkable diversity in the potential to mediate pro- versus anti-tumor immune responses dependent on HLA genotype”

Hannah Brinkman, University of California, Davis, USA “Nucleoside analogs in ADAR guide strands targeting 5'-UA sites”

Deborah Caswell, The Francis Crick Institute, United Kingdom, “The role of APOBEC3B in lung tumour evolution and targeted therapy resistance”

Xiaoyu Chen, Arizona State University, USA, “Understanding precision genome editing tools: molecular basis of efficient DNA deamination by ABE8e”

Quinn Cowan, University of California, San Diego, USA, “Development and characterization of multiplexed orthogonal base editing systems”

Alexandra Dananberg, Cornell University, USA, “Investigating mechanisms of APOBEC3A-dependent episodic mutagenesis”

Jessica Devenport, Washington University, USA, “The role of APOBEC3A in ovarian cancer progression”

Erin Doherty, University of California, Berkeley, USA, “Directed evolution of precision adenine base editors”

Cameron Durfee, UT Health San Antonio, San Antonio, USA “Human APOBEC3B promotes cancer in mice with evidence for signature mutations, tumor heterogeneity, and metastasis”

Diako Ebrahimi, Texas Biomedical Research Institute, San Antonio, USA, “Quantification of APOBEC3 dysregulation in cancer”

Anna Gramalla-Schmitz, University of Zurich, Switzerland, “The role of gene editors in B-cell lymphomagenesis during chronic viral infection”

Sharon Guffy, Pairwise, North Carolina, USA, “Structure-based optimization of Cas12a cytosine base editors for applications in crops”

Ian Harding, Wave Life Sciences, Massachusetts, USA, “Application of ADAR-mediated RNA editing to modulate protein-protein interactions”

Adam Hedger, University of Massachusetts, USA, “Synthesis and Co-Crystal structure of an oligonucleotide inhibitor bound to the catalytically active APOBEC3G-CTD deaminase”

Logan Hille, Harvard University, USA, “Precise and efficient base editing with PAM variant Cas9 enzymes capable of recognizing non-NGG PAMs”

Jane Isquith, University of California, San Diego, USA, “Deaminase deregulation in myeloproliferative neoplasms and the hematopoietic niche”

Casey Jacobsen, University of California, Davis, USA, “*En masse* examination of RNA guides (EMERGE) for ADARs”

Geoff Jameson, Massey University, New Zealand “Design, synthesis, and evaluation of cross-linked oligonucleotides as first nanomolar inhibitors of APOBEC3A”

Geoff Jameson, Massey University, New Zealand, “Structural basis for binding of single-stranded DNA and processivity of APOBEC3G”

Agya Karki, University of California, Davis, USA, “ADAR activation by inducing a *syn* conformation at guanosine adjacent to an editing site”

Emily King, Harvard University, USA, “Compatibility of precise adenine base editors with Cas9 PAM variants and small orthologs”

Dieter Lam, Beam Therapeutics, Cambridge, USA, “CBE-T: Cytosine base editors utilizing TadA variants generated from directed evolution and structure-guided protein engineering”

Lavanya Manjunath, University of California, Irvine, USA, “APOBEC3B drives PKR-mediated translation shutdown in response to viral infection”

Sunwoo Oh, University of California, Irvine, USA, “APOBEC3B protects stress granule-associated RNAs from RNase L activity”

David O’Leary, Washington University St. Louis, USA, “SMC5/6 is required for resolution of APOBEC3A-mediated replication stress”

Pablo Perez-Duran, Horizon Discovery / Perkin Elmer Group, United Kingdom, “Base editor screening platforms to characterize performance of the modular components of Horizon’s Pin-Point™ base editing system”

Helen Piontkivska, Kent State University, USA, “Changes in ADAR RNA editing patterns in CMV and ZIKV congenital infections”

Brodie Ranzau, University of California, San Diego, USA, “A highly sensitive fluorescent reporter for adenine base editing reveals DNA Base editing by the wild-type tRNA adenosine deaminase enzyme TadA”

Amanda Rieffer, University of Minnesota, Minneapolis, USA, “Dinucleotide reporters for quantitative comparison of base editing rates in human cells”

Josefine Striepen, Cornell University, USA, “Characterizing the role of APOBEC3 deaminases in Lung Adenocarcinoma mutagenesis”

Zhiyi Sun, New England Biolabs, USA, “Non-destructive enzymatic deamination coupled with next-generation sequencing enables accurate detection and phasing of 5mC and 5hmC in a genome-wide or locus-specific manner”

Michal Svoboda, Czech Academy of Sciences, Czech Republic, “NMR assays for analysis of APOBEC3A substrate specificity”

Minjing Wang, University of Minnesota, Minneapolis, USA, “A platform for multiplex editing of NK cell to enhance cancer immunotherapy”

Julian Weischedel, University of Zurich, Switzerland, “MEGA – a modular epigenetic and genetic AID base editor”

Bryce Wick, University of Minnesota, USA, “Inducing dominant-negative mutations using base editors in Fas and TGF β R2 leads to increased CAR T cell performance”

Chloe Wick, University of Minnesota, Minneapolis, USA, “APOBEC3A induction by mitochondrial double-stranded RNA triggers DNA damage”

Bailey Wong, University of California, Davis, USA, “Selection of RNA oligonucleotides with high binding affinity to ADAR”

Mackenzie Wyllie, University of Minnesota, USA, “The role of cytidine sugar conformation in ssDNA-APOBEC3 selectivity”

Hongzhi Zeng, Rice University, USA, “Engineered PROTAC-CID systems for mammalian inducible gene regulation”

6:00 PM –

ON OWN FOR DINNER

Evening Free to Enjoy Restaurants of Palm Springs

TUESDAY, JANUARY 24

7:30 – 8:30 AM **BREAKFAST**

8:30 – 10:10 AM **SESSION V**

Convener: **Brandon Moriarity, University of Minnesota**

8:30 – 8:50 **Erez Levanon**, Bar Ilan University, Israel, **(Virtual)** “Identification of exceptionally potent adenosine deaminases RNA editors from high body temperature organisms”

8:50 – 9:10 **Invited Speaker: Tim Fenton**, University of Southampton, UK, “30 years on from PHORBOLIN-1: a role for APOBEC3A in keratinocyte differentiation?”

9:10 – 9:30 **Invited Speaker: Reuben Harris**, UT Health San Antonio & HHMI, USA, “Ancient origins of APOBEC3B inhibition by herpesviruses”

9:30 – 9:50 **Amanuella Mengiste**, Massachusetts Institute of Technology, USA, “MutaT7: repurposing deaminases to enable targeted mutagenesis for continuous directed evolution applications”

9:50 – 10:10 **Geoffrey Jameson**, Massey University, New Zealand, “Structural basis of modified DNA inhibitors that competitively restrict DNA-editing activity of APOBEC3A”

10:10 – 10:40 AM **COFFEE BREAK**

10:40 – 12:40 PM **SESSION VI**

Convener: **Audrone Lapinaite, Arizona State University**

10:40 – 11:00 **Invited Speaker: Pablo Perez-Pinera**, University of Illinois, Urbana-Champaign, USA, **(Virtual)** “Treatment of neurodegenerative disorders by *in vivo* base editing”

11:00 – 11:20 **Invited Speaker: Simon Baker**, York University, UK, “APOBEC3A/B-mediated damage of the genome is initiated by BK polyomavirus infections of the human urothelium”

11:20 – 11:40 **Invited Speaker: Laura Pasqualucci**, Columbia University, USA, “Aberrant AID-dependent somatic hypermutation in diffuse large B cell lymphoma”

11:40 – 12:00 **Bojana Stefanovska**, UT Health San Antonio & HHMI, USA, “Targeted CRISPR screen to identify synthetic lethal combinations between APOBEC3B and DNA repair”

TUESDAY, JANUARY 24

- 12:00 – 12:20 **Nicole Gaudelli**, Beam Therapeutics, USA, “Non-genotoxic antibody-based conditioning paired with multi-plex base edited HSCs for the potential treatment of hemoglobinopathies” **(Sponsored by Beam Therapeutics)**
- 12:20 – 12:40 **Christiano Alves**, Harvard Medical School, USA,
“Base editing as a genetic treatment for spinal muscular atrophy”
- 12:45 – 1:45 PM **LUNCH**
- 2:00 – 4:00 PM** **SESSION VII**
- Convener:** **Matthew Weitzman**, Children’s Hospital of Philadelphia
- 2:00 – 2:20 **Invited Speaker: Nicolas Gillet**, University of Namur, Belgium,
“APOBEC3B is an adenovirus restriction factor”
- 2:20 – 2:40 **Invited Speaker: Rémi Buisson**, University of California, Irvine, USA,
“Cytosine deaminase-independent antiviral functions of APOBEC3B”
- 2:40 – 3:00 **Yiannis Savva**, Shape Therapeutics, Inc., USA, “A molecular and computational toolbox to enable therapeutic A-to-I RNA editing”
(Sponsored by Shape Therapeutics)
- 3:00 – 3:20 **Sara Cuevas Ocaña**, University of Nottingham, UK, “CRISPR-Cas9, base editing and prime editing applications for human induced pluripotent stem cells”
- 3:20 – 3:40 **Evan Kleinboehl**, University of Minnesota, USA,
“Development and testing of a versatile genome editing application reporter”
- 3:40 – 4:00 **Invited Speaker: Jia Chen**, Shanghai Tech University, China, **(virtual)**
“Eliminating base editor-induced genome-wide and transcriptome-wide off-target mutations”
- 4:00 – 6:30 PM Break to Enjoy Palm Springs
- 6:30 – 8:00 PM **Banquet including Student and Postdoc Presentation Awards by New England Biolabs**