

# Pacific Coast Protease Spring School

**Palm Canyon Resort  
Borrego Springs, California  
April 24 – 27, 2022**



Organized by Matt Bogyo, Olivier Julien,  
Anthony O'Donoghue and Antoine Dufour

# ABOUT THE WORKSHOP

**This workshop is designed to provide a stimulating expert environment for the discussion of new information on proteolytic enzymes, their substrates, their inhibitors, and their function.**

**The objective is to provide trainees (junior faculty, post-docs, and graduate students) with experience in presenting their work to an expert audience, chairing scientific sessions, and to foster collaborations. Expert external faculty will give guest presentations and stimulate discussions.**

**The work presented here is state-of-the-art and much is yet to be published. Consequently, professional use of the data and ideas learned at the workshop is prohibited without the expressed consent of the respective presenters and their supervisors.**



**There will be awards at the end of the workshop, including the coveted "Half Moon" for the best presentation.**

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# PRESENTATIONS AND ABSTRACTS

**Trainee talks are 15 min (12 min + 3 min discussion).**

**Guest faculty talks are 30 min (25 min + 5 min discussion).**

**Speaker abstracts are listed in order of presentation.**



## Sunday, April 24<sup>th</sup>

3:00 pm	Matt, Anthony, OJ and Tony	Welcome!	Location: Upstairs Conference Room
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*Chairs: Nabangshu Das and Matteo Guerra*

Time	Speaker	Title	Lab
3:20 pm	Micheal Winter	<i>Harnessing Tumor-Associated Protease Activity for the Development of Activatable Antibody Therapeutics</i>	Outside Expert
3:50 pm	Laura Keller	<i>Chemoproteomics identifies proline-specific serine proteases involved in membrane integrity in Bacteroides thetaiotaomicron</i>	Bogyo
4:05 pm	Micheal Yoon	<i>Selective Neutral pH Inhibitor of Cathepsin B Designed Based on Cleavage Preferences at Cytosolic and Lysosomal pH Conditions</i>	O'Donoghue
4:20 pm	Luiz de Almeida	<i>The effects of legumain inhibition in macrophages as determined by proteomics and N-terminomics</i>	Dufour
4:35 pm	Bridgette Hartley	<i>Proteolysis during ischemic cardiac injury</i>	Julien
4:50 pm	Nick Young	<i>In silico and biochemical screening of TMPRSS2 inhibitors as an antiviral strategy against SARS-CoV-2</i>	Craik
5:05 pm	Coffee break	Location: Conference Room	



Chairs: Laura Keller and Anjali Kapilan

Time	Speaker	Title	Lab
5:35 pm	David Marchant	<i>The Roles of Matrix Metalloproteinases 9 and 12 in Antiviral Immunity</i>	Outside Expert
6:05 pm	Dustin Pwee	<i>MG-132 is a broad-spectrum cysteine and aspartyl protease inhibitor</i>	O'Donoghue
6:20 pm	Matteo Guerra	<i>Towards real time ratiometric imaging of solid tumors</i>	Bogyo
6:35 pm	Erik Gomez	<i>Identification of caspase substrates involved in cell differentiation</i>	Julien
6:50 pm	Scott Snipas	<i>Gain of function of a metalloproteinase associated with multiple myeloma, bicuspid aortic valve, and Von Hippel Lindau syndrome</i>	Salvesen
7:05 pm	Jimmy Lu	<i>Determining the role of rhomboid protease GlpG in pathogenic bacteria colonization: a potential solution to recurrent bacterial infections</i>	Lemieux
7:15 pm	Dinner	Location: Big Horn Bar and Grill	



# Monday, April 25<sup>th</sup>

Chairs: Luiz de Almeida and Dustin Pwee

Time	Speaker	Title	Lab
8:30 am	Breakfast	Location: Big Horn Bar and Grill	
9:00 am	Jeanne Hardy	<i>Identifying and Engaging Substrate-Selective Protease Exosites</i>	Outside Expert
9:30 am	Nabangshu Das	<i>Interaction of Proteoglycan 4 and Trypsin: A Key Target in Altered Inflammatory Signaling in Osteoarthritis</i>	Dufour
9:45 am	Lawrence Liu	<i>The catalytic core of the proteasome as a drug target to treat Human African Trypanosomiasis</i>	O'Donoghue
10:00 am	John Bennett	<i>Application of Mixed Alkyl/Aryl Phosphonates to Identify Essential Serine Hydrolases in Plasmodium Falciparum</i>	Bogyo
10:15 am	Haley Penkala	<i>An expanded 2-pyridinecarboxaldehyde-based chemoproteomics toolbox for probing protease specificity</i>	Weeks
10:30 am	Coffee break	Location: Conference Room	



Chairs: Eman Moussa and Lawrence Liu

Time	Speaker	Title	Lab
11:00 am	Kaitlin Schaefer	<i>Direct identification of proteolytic cleavages on living cells using a glycan tethered peptide ligase</i>	Wells
11:15 pm	Tulsi Upadhyay	<i>Identification of an inhibitor of DnaK chaperone function: A potential antibacterial approach</i>	Bogyo
11:30 am	Amelia Chen	<i>The mutations in SARS-CoV-2 main protease found in virus variants reveal changes in activity towards viral and host substrates</i>	Lemieux
11:45 am	Consuelo Saucedo	<i>Microbiome Driven Proteolysis as a Contributing Factor to Inflammatory Bowel Disease</i>	O'Donoghue
12:00 pm	lunch	Location: Conference Room	
1:00 pm	Dune Buggy	Borrego sand dunes	
7:30 pm	Dinner	Location: Pablito's Mexican Bar & Grill	





## Tuesday, April 26<sup>th</sup>

Chairs: John Bennett and Bridgette Hartley

Time	Speaker	Title	Lab
8:30 am	Breakfast	Location: Big Horn Bar and Grill	
9:00 am	Mia Huang	<i>Precision chemical tools to probe glycoconjugate structure and interactions</i>	Outside Expert
9:30 am	Shu Luo	<i>Perceive the cleave: identifying SARS-CoV-2 M<sup>pro</sup> human substrates using subtiligase N-terminomics</i>	Julien
9:45 am	Nikki Pedowitz	<i>A peptide conjugated biosensor for direct detection of active Borrelia spirochetes in Lyme disease</i>	Bogyo
10:00 am	Anjali Kapilan	<i>N-terminomics and proteomics investigation of Calpain-2 Substrates in Macrophages</i>	Dufour
10:15 am	Coffee break	Location: Conference Room	



Chairs: Haley Penkala and Michael Yoon

Time	Speaker	Title	Lab
10:45 am	Stephanie Luedtke	<i>Detection of proteases in acidified breast milk and evaluation the effect of pasteurizing on their catalytic activity</i>	O'Donoghue
11:00 am	Rashad Baker	<i>Identification and Characterization of Exosites Mediating the Caspase-6:DJ-1 Complex</i>	Hardy
11:15 am	Jonathan Mazza	<i>Development of an Enzymatic Oxidative Coupling Bioconjugation</i>	Wells

11:30 pm	Betsy Verdugo	<i>Extended substrate profiling of the pyroptosis effector protein gasdermin D reveals recognition region by inflammatory caspase-11</i>	Salvesen
11:45 pm	Michael Sveiven	<i>Giant magnetoresistive biosensors for real-time quantitative detection of protease and endonuclease activity</i>	O'Donoghue
12:00 pm	Lunch	Location: Big Horn Bar and Grill	



Chairs: Nikki Pedowitz and Betsy Verdugo

Time	Speaker	Title	Lab
1:00 pm	Jan Potempa		Outside Expert
1:30 pm	Franco Faucher	<i>De Novo Discovery of a Covalent Small Molecule Immune Checkpoint Inhibitor Using Phage Display</i>	Bogyo
1:45 pm	Eman Moussa	<i>Prospecting for Viral Protease Substrates and Mining for Mistranslation</i>	Julien
2:00 pm	Brianna Hurysz	<i>Recombinant expression and characterization of a thermophilic clostripain-like cysteine protease</i>	O'Donoghue
2:15 pm	Andrew Smith	<i>Investigating Caspase: Tau Interactions by Mass Spectrometry for Exosite Identification</i>	Hardy
2:30 pm	Elany da Silva	<i>Intramolecular interactions enhance the potency of Gallinamide A analogues against Trypanosoma cruzi</i>	O'Donoghue
2:45 pm	Conner Bardine	<i>In vivo measurement of granzyme proteolysis from activated immune cells with PET</i>	Craik
3:00 pm	Jeyun Jo	<i>Discovery and SAR studies of novel bis-sulfones as non-electrophilic antioxidant response element (ARE) activators</i>	Bogyo
7:30 pm	Dinner and Awards	Location: Big Horn Bar and Grill	



**Wednesday, April 17<sup>th</sup>**

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9:00 am

Departure

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## Emails

Matthew Bogyo: mbogyo@stanford.edu
Tulsi Upadhyay: tulsiu@stanford.edu
Jeyun Jo: jeyunjo@stanford.edu
John Bennett: jmbennet@stanford.edu
Nikki Pedowitz: pedowitz@stanford.edu
Matteo Guerra: matteog@stanford.edu
Franco Faucher: faucher@stanford.edu
Laura Keller: ljceller@stanford.edu
Betsy Verdugo: bbibo@sbpdiscovery.org
Scott Snipas: ssnipas@sbpdiscovery.org
Anthony O'Donoghue: ajodonoghue@health.ucsd.edu
Elany Barbosa: elbarbosadasilva@health.ucsd.edu
Dustin Pwee: dpwee@ucsd.edu
Stephanie Luedtke: sluedtke@ucsd.edu
Lawrence Liu: jliu@ucsd.edu
Brianna Hurysz: bhurysz@health.ucsd.edu
Michael Sveiven: msveiven@eng.ucsd.edu
Consuelo Saucedo: csauceda@health.ucsd.edu
Michael Yoon: mcyoon@health.ucsd.edu
Antoine Dufour: antoine.dufour@ucalgary.ca
Nabangshu Das: nabangshu.das@ucalgary.ca
Luiz de Almeida: luizgustavo.almeida@ucalgary.ca
Anjali Kapilan: anjali.kapilan@ucalgary.ca
Olivier Julien: ojulien@ualberta.ca
Bridgette Hartley: bhartley@ualberta.ca
Lucy Luo: syluo@ualberta.ca
Erik Gomez: gomezcar@ualberta.ca
Eman Moussa: moussa@ualberta.ca
Haley Penkala: hpenkala@wisc.edu
Andrew Smith: andjsmith@umass.edu
Rashad Baker: rashadbaker@umass.edu
Conner Bardine: Conner.Bardine@ucsf.edu
Nick Young: Nicholas.Young2@ucsf.edu
Joanne Lemieux: mlemieux@ualberta.ca
Jimmy Lu: jimmy5@ualberta.ca
Sizhu (Amelia) Chen: sizhu@ualberta.ca
Kaitlin Schaefer: kaitlin.schaefer@ucsf.edu
Johnathan Maza: johnathan.maza@ucsf.edu
Mia Huang: miahuang@scripps.edu
David Marchant: marchant@ualberta.ca
Jan Potempa: jan.potempa@icloud.com
Jeanne Hardy: hardy@chem.umass.edu
Micheal Winter: mwinter@cytomx.com