



“NEW ADVANCES IN OPIOID
RESEARCH: FROM BENCH
TO THE BEDSIDE”

INRC
2022

VALENCIA (SPAIN)
4th-8th July 2022 | Hotel Meliá Valencia

INRC²⁰²²

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“NEW ADVANCES IN OPIOID
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SCHEDULE

TIME	MONDAY, JULY 4	TUESDAY, JULY 5	WEDNESDAY, JULY 6	THURSDAY, JULY 7	FRIDAY, JULY 8
08:30					
09:00		PLENARY LECTURE 1	PLENARY LECTURE 2	YOUNG INVESTIGATOR AWARDS 2020-2021-2022	PLENARY LECTURE 3
09:30		SYMPOSIUM 1	SYMPOSIUM 4		SYMPOSIUM 8
10:00		SYMPOSIUM 1	COFFEE BREAK		
10:30		SYMPOSIUM 1	SYMPOSIUM 4		SYMPOSIUM 8
11:00		HOT TOPICS	HOT TOPICS	SYMPOSIUM 6	
11:30		DATA BLITZ	DATA BLITZ		SYMPOSIUM 9
12:00					
12:30			LUNCH		
13:00					
13:30					LUNCH
14:00		SYMPOSIUM 2	FOUNDER'S LECTURE	SYMPOSIUM 7	
14:30					
15:00		SYMPOSIUM 3	SYMPOSIUM 5		SYMPOSIUM 10
15:30					
16:00					COFFEE BREAK
16:30		POSTER SESSION 1	POSTER SESSION 2	MENTORING ACTIVITIES	BUSINESS MEETING
17:00					CLOSING REMARKS AND FAREWELL
17:30					
18:00					
18:30		REGISTRATION (DOCUMENT HAND-OUT)			
19:00					
19:30		WELCOME RECEPTION & OPENING CEREMONY		GUIDED VISIT TO CAC	
20:00					
20:30			INRC BAR	GET TOGETHER	GALA DINNER
21:30					

MONDAY 4TH JULY

From 06:00 pm
Registration at the Venue

07:00-08:30 pm
Welcome Reception and Opening Ceremony

INRC²⁰²²

TUESDAY 5TH JULY

08:30-09:10 am

PLENARY LECTURE

Chair: Lucia Hipólito (*University of Valencia*)

■ How did it come to be, and what is the trajectory?

Dr. Chris Evans (*University of California Los Angeles*)

09:10-09:20 am

Discussion

09:20-11:00 am

SYMPOSIUM 1

Development of KOR agonists as therapeutic agents

Chair: Lee-Yuan Liu-Chen (*Temple University*)

■ 09:20-09:40 am

KOR Agonists Reduce Neuroinflammation and Promote Remyelination in Preclinical Models of Multiple Sclerosis

Thomas Prisinzano (*University of Kentucky*)

■ 09:40-10:00 am

Anti-Pruritic Effects of Kappa Opioid Receptor (KOR) Agonists: Evidence from Rodents to Humans

Saadet Inan (*Temple University*)

10:00 -10:20 am

COFFEE BREAK

■ 10:20-10:40 am

A Newly Synthesized Kappa Opioid Receptor Agonist Ameliorates Acute and Chronic Pain without Causing Sedation or Aversion in Mice

Hiroshi Nagase (*University of Tsukuba*)

■ 10:40-11:00 am

Agonist-Promoted Phosphorylation and Internalization of the Kappa Opioid Receptor (KOR) in Male Mouse Brains: Lack of Connection with Conditioned Place Aversion

Lee-Yuan Liu-Chen (*Temple University*)

11:00-11:10 am

Discussion

→ Tuesday 5th July

11:10-11:50 am

HOT TOPIC

Chemistry, structural biology and computational approaches to design new opioid ligands

Chairs:

Susruta Majumdar (*UHSP/Washington University*)

Nurulain Zaveri (*Astraea Therapeutics*)

■ **11:10-11:20 am**

Targeting the allosteric sodium binding pocket in mu opioid receptor

Susruta Majumdar (*UHSP/Washington University*)

■ **11:20-11:30 am**

Structure-based discovery of novel chemotypes and functionalized ligands for OUD targets

Vsevolod "Seva" Katritch (*University of Southern California*)

■ **11:30-11:40 am**

Taking two shots on goal with a single chemical entity- Using structure-based design to tailor bifunctional opioid pharmacology of Nociception Opioid Receptor (NOP) Ligands

Nurulain Zaveri (*Astraea Therapeutics*)

■ **11:40-11:50 am**

Structure, function and pharmacology of delta opioid receptor bitopic ligands

Tao Che (*Washington University*)

11:50 am-12:00 pm

Discussion

12:00-12:30 pm

DATA BLITZ

Chairs:

Ream Al-Hasani (*University of Health Sciences and Pharmacy/ Washington University*)

Meritxell Canals (*Nottingham University*)

12:30-01:30 pm

LUNCH

INRC²⁰²²

→ Tuesday 5th July

01:30-02:50 pm

SYMPOSIUM 2

New tools for in-vivo studies of signaling and circuits

Chairs:

Carrie Stine (*University of Washington*)

Patrick O'Neill (*University of California Los Angeles*)

■ 01:30-01:50 pm

In vivo photopharmacology with caged opioid drugs and peptides

Matthew Banghart (*University of California San Diego*)

■ 01:50-02:10 pm

Illuminating the dynamics of neuromodulators and their intracellular signals

Yao Chen (*Washington University*)

■ 02:10-02:30 pm

Next-gen opto-GPCRs: from cells to circuits

Patrick O'Neill (*University of California Los Angeles*)

■ 02:30-02:50 pm

Genetically encoded opioid peptide sensors for detecting endogenous opioid release

Carrie Stine (*University of Washington*)

02:50-03:00 pm

Discussion

03:00-04:00 pm

SYMPOSIUM 3

The role of opioid receptors in headache disorders

Chair: Amynah Pradhan (*University of Illinois Chicago*)

■ 03:00-03:20 pm

Uncovering a neuroendocrine link to female-selective pain and migraine

Frank Porreca (*University of Arizona*)

■ 03:20-03:40 pm


Differential role of mu and delta opioid receptors in migraine

Amynah Pradhan (*University of Illinois Chicago*)

■ 03:40-04:00 pm

Identification of NOP receptor agonists for the treatment of migraine

Katarzyna M. Targowska-Duda (*Medical University of Lublin*)



Valencia (Spain)
4th-8th July 2022 | Hotel Meliá Valencia

→ Tuesday 5th July

04:00-04:10 pm

Discussion

04:10-06:00 pm

POSTER SESSION (with coffee)

WEDNESDAY 6TH JULY

08:30-9:10 am

PLENARY LECTURE

Chair: Amynah Pradhan (*University of Illinois Chicago*)

■ **Opioid receptors: 30 years into brain function**

Dr. Brigitte Kieffer (*INSERM/University of Strasbourg France*)

09:10-09:20 am

Discussion

09:20-11:00 am

SYMPOSIUM 4

Mechanisms of function of endogenous and exogenous opioids in pain, reward and affective neural circuits

Chair: Grégory Scherrer (*University of North Carolina at Chapel Hill*)

■ **09:20-09:40 am**

Mu opioid receptor-mediated regulation of ventral pallidum mechanisms of addiction

Meaghan Creed (*Washington University*)

■ **09:40-10:00 am**

Dynorphinergic control of amygdalo-striatal circuits for goal-directed action

Michael Bruchas (*University of Washington*)

10:00 -10:20 am

COFFEE BREAK

■ **10:20-10:40 am**

MOR-neurons in the dorsal raphe nucleus: role in reward and affective behaviors

Lola Welsch (*University of Strasbourg/INSERM*)

■ **10:40-11:00 am**

Regional and cell-type specific molecular architecture of the opioid system in neural circuits

Grégory Scherrer (*University of North Carolina at Chapel Hill*)

11:00-11:10 am

Discussion

→ **Wednesday 6th July**

11:10-11:50 am

HOT TOPIC

Prefrontal cortical opioid systems: from synapses to affective-and pain-related behavior

Chair: Hugo Tejada (*National Institute of Mental Health, National Institutes of Health*)

■ **11:10-11:20 am**

Genetic strategies targeting nociceptive and opioidergic cortical cell-types
Gregory Corder (*University of Pennsylvania*)

■ **11:20-11:30 am**

Enkephalin regulation of synaptic transmission in anterior cingulate cortex
Will Birdsong (*University of Michigan*)

■ **11:30-11:40 am**

The role of the endogenous dynorphin / kappa-opioid receptor system in regulating prefrontal cortical threat processing and circuit function
Huikun Wang (*National Institute of Mental Health, National Institutes of Health*)

■ **11:40-11:50 am**

Mouse models of surgical and neuropathic pain produce distinct alterations to the excitability of prodynorphin-expressing neurons in the prelimbic cortex
Patrick Sheets (*Indiana University School of Medicine*)

11:50 am-12:00 am

Discussion

12:00-12:30 pm

DATA BLITZ

Chairs:

Ream Al-Hasani (*University of Health Sciences and Pharmacy/ Washington University*)
Meritxell Canals (*Nottingham University*)

12:30-01:30 pm

LUNCH

INRC²⁰²²

→ **Wednesday 6th July**

01:30-02:30 pm

FOUNDER'S LECTURE

- **From CSF to reversal of opioid-induced damages to the brain**
Fred Nyberg (*Uppsala University*)
- **Pain inhibition via peripheral opioid receptors**
Christoph Stein (*Charité Universitätsmedizin Berlin, Freie Universität Berlin*)

02:30-03:50 pm

SYMPOSIUM 5

The gut-brain-axis: a key regulator of opioid pharmacology or just a gut feeling?

“The symposium is supported by the British Pharmacological Society”

Chairs:

Anna Taylor (*University of Alberta*)
Alexis Bailey (*St. George's University of London*)

■ **02:30-02:50 pm**

The Epithelium-Nociceptor Interaction in Opioid-Induced Dysbiosis
Hamid Akbarali (*Virginia Commonwealth University*)

■ **02:50-03:10 pm**

Dose- and Sex-Dependent Bidirectional Relationships for Intravenous Fentanyl Self-Administration and the Gut Microbiome
Michelle Ren (*University of California Irvine*)

■ **03:10-03:30 pm**

Gut-Brain Axis and Early Life Opioid Receptor Neurodevelopment: The Devil is in the Milk
Alexis Bailey (*St. George's University of London*)

■ **03:30-03:50 pm**

Daily Intermittent Fasting in Mice Enhances Opioid Pain Relief and Reduces Side Effects
John Streicher (*University of Arizona*)

03:50-04:00 pm

Discussion

04:00-06:00 pm

POSTER SESSION (with coffee) Room Valentia A



Valencia (Spain)
4th-8th July 2022 | Hotel Meliá Valencia

→ Wednesday 6th July

08:15-09:30 pm

INRC BAR

Place: Àtic-Palau Alameda

Adress: Calle de Muñoz Seca,1 - 46010 Valencia.

THURSDAY 7TH JULY

08:30-10:10 am

YOUNG INVESTIGATOR AWARDS 2020,2021 AND 2022

Chair: Lee-Yuan and Liu-Chen (*Temple University*)

YIA 2020: Ream Al-Hasani (*University of Health Sciences and Pharmacy/ Washington University*)

YIA 2021: Richard M. Van Rijn (*Purdue University*)

YIA 2022: John Streicher (*University of Arizona*)

■ 08:30-09:20 am

YIA 2020: How the support of a scientific community advanced my research
Ream Al-Hasani (*Washington University*)

■ 09:20-10:10 am

YIA 2022: The Organization of Mu Opioid Receptor Signal Transduction Cascades in the Spinal Cord by Heat Shock Protein 90
John Streicher (*University of Arizona*)

10:10-10:30 am

COFFEE BREAK

10:30-12:50 am

SYMPOSIUM 6

Sex specific opioid signaling: implications for pain management and abuse potential
“MJ Kreek Memorial Symposium”

■ 10:30-10:40 am

MJ Kreek Memorial
Brian Reed (*Rockefeller University*)

Chair: Anne Z. Murphy (*Georgia State University*)

■ 10:40-11:00 am

Impact of age and sex on mu opioid receptor signaling in the periaqueductal gray of male and female rats
Anne Z. Murphy (*Georgia State University*)

■ 11:00-11:20 am

Time-dependent effects of oxycodone abstinence on thalamo-accumbens synaptic plasticity and cue reinstatement
Yanaira Alonso-Carballo (*University of Minnesota, Harvard University*)

→ Thursday 7th July

■ 11:20-11:40 am

Pain-associated fentanyl intake in males is driven by dynamic activity of ventral tegmental area dopamine neurons

Jessica Higginbotham (*Washington University*)

■ 11:40-12:00 am

Probing PAG dopamine circuits in pain

Thomas L. Kash (*University of North Carolina Chapel Hill*)

12:50-01:00 pm

Discussion

12:30-01:30 pm

LUNCH

01:30-03:00 pm

SYMPOSIUM 7

Neonatal opioid exposure: immediate and long-term consequences

Chair: Julie A. Blendy (*University of Pennsylvania*)

■ 01:30-01:50 pm

Neonatal Opioid Withdrawal Syndrome in mice impacts behavior and gene expression

Shivon A. Robinson (*University of Pennsylvania, Williams College*)

■ 01:50-02:10 pm

Behavioral and brain transcriptomic adaptations in outbred CFW mice and inbred FVB substrain differences in a model for neonatal opioid withdrawal syndrome

Camron D. Bryant (*Boston University*)

■ 02:10-02:30 pm

Perinatal oxycodone exposure affects developmental milestones and adult sensory and reward behavior in mice.

Marwa Mikati (*Washington University*)

■ 02:30-02:50 pm

The impact of prenatal methadone exposure on sensorimotor cortices

Brady Atwood (*Indiana University*)

02:50-03:00 pm

Discussion

“NEW ADVANCES IN OPIOID RESEARCH: FROM BENCH TO THE BEDSIDE”

INRC²⁰²²

→ Thursday 7th July

04:00-05:30 pm

MENTORING ACTIVITIES

07:00 pm

VISIT TO CIUDAD DE LAS ARTES Y LAS CIENCIAS

Important: In case you are interested it is mandatory to notify your attendance to inrc2022@viajeseci.es before 1st July.

■ **06:50 pm**

MEETING POINT AT:

Restaurante Contrapunto Les Arts

Av. del Profesor López Piñero, 1, 46013 Valencia)

■ **07:00 pm**

START OF THE VISIT

(groups accompanied by guides)

08:00-09:30 am

GET TOGETHER

■ **LOCATION**

Restaurante Contrapunto Les Arts

Av. del Profesor López Piñero, 1, 46013 Valencia

Important: Please notify your attendance “by clicking” the activity assistance at your web registration profile. Please notify before 1st July

FRIDAY 8TH JULY

08:30-09:10 am

PLENARY LECTURE

Chair: José Morón-Concepción (*Washington University*)

■ **Implantable wireless systems for the study and treatment of pain, substance use disorder, and overdose**

Dr. Robert W. Gereau (*Washington University*)

09:10-09:20 am

Discussion

09:20-11:00 am

SYMPOSIUM 8

Dynorphin and KOR signaling controlling pain, cognition and stress responses

Chairs:

Charles Chavkin (*University of Washington*)

Elyssa Margolis (*University of California, San Francisco*)

■ **09:20-09:40 am**

Stress can reverse the sign of KOR signaling in midbrain dopamine neurons.

Elyssa Margolis (*University of California San Francisco*)

■ **09:40-10:00 am**

Dissecting the accumbal dynorphinergic outputs underlying affective pain

Nicolas Massaly (*Washington University*)

10:00 -10:20 am

COFFEE BREAK

■ **10:20-10:40 am**

The role of the endogenous dynorphin / kappa-opioid receptor system in regulating prefrontal cortical threat processing and circuit function

Hugo Tejada (*National Institute of Mental Health, National Institutes of Health*)

■ **10:40-11:00 am**

Stress potentiation of addiction risk: dynorphin-mediated cellular and circuit mechanisms

Charles Chavkin (*University of Washington*)

11:00-11:10 am

Discussion

INRC²⁰²²

→ Friday 8th July

11:10 am-01:30 pm

SYMPOSIUM 9

Examination of pain and addiction: the hits, the misses, and the opportunities

“The symposium is supported by the Institute of NeuroImmune Pharmacology”

Chairs:

Yolanda Campos-Jurado (*Washington University*)

Arbi Nazarian (*Western University School of Medicine*)

Sulie L. Chang (*Institute of NeuroImmune Pharmacology/Seton Hall University*)

Part I: Pain and opioid addiction

■ **11:10-11:30 am**

Pain-induced impulsivity, the role of opioids, and where we go from here

Arbi Nazarian (*Western University of Health Sciences*)

■ **11:30-11:50 am**

Pain and opioid abuse: thinking outside the brain

S. Stevens Negus (*Virginia Commonwealth University*)

■ **11:50 am-12:10 pm**

Opposing effects of striatal mu opioid receptor involvement in opioid mediated analgesia

Catherine Cahill (*University of California Los Angeles*)

12:10-12:20 pm

Discussion

Part II: Pain, alcohol addiction and opioid receptors

■ **12:20-12:40 pm**

Alcohol modulation of the pain system

Sulie L. Chang (*Institute of NeuroImmune Pharmacology/Seton Hall University*)

■ **12:40-01:00 pm**

Which comes first, neuroimmunity or mu-opioid receptors? A pivotal relationship to unravel inflammatory pain-induced alcohol use disorders

Javier Cuitavi (*University of Valencia*)

→ Friday 8th July

■ **01:00-01:20 pm**

Alcohol, sex and pain: a convoluted cocktail?
Yolanda Campos-Jurado (*Washington University*)

01:20-01:30 pm

Discussion

01:30-02:30 pm

LUNCH

02:30-03:50 pm

SYMPOSIUM 10

Opioids and cannabinoids for pain: translational research session

Chairs:

Kelly E. Dunn (*Johns Hopkins University*)

Lawrence Carey (*University of Texas Health Science Center*)

■ **02:30-2:50 pm**

Cannabinoid/opioid interactions in rhesus monkeys: effects of phytocannabinoids on opioid antinociception, withdrawal, and self-administration.

Lawrence Carey (*University of Texas Health Science Center*)

■ **02:50-03:10 pm**

Human Laboratory Examination of the Opioid-sparing Effects of Cannabinoids

Ziva D. Cooper (*University of California Los Angeles*)

■ **03:10-3:30 pm**

How Opioid Sensitivity May Play a Role in Cannabinoid Opioid-sparing Effects: A Human Laboratory Examination

Kelly E. Dunn (*Johns Hopkins University*)

■ **03:30-03:50 pm**

Examining the Association between Endocannabinoid System Gene Variants and the Reinforcing and Analgesic Effects of Hydromorphone Measured in a Human Laboratory Study

Cecilia L. Bergeria (*Johns Hopkins University*)

03:50-04:00 pm

Discussion

“NEW ADVANCES IN OPIOID RESEARCH: FROM BENCH TO THE BEDSIDE”

INRC²⁰²²

→ Friday 8th July

04:00-04:20 pm
COFFEE BREAK

04:20-05:20 pm
BUSINESS MEETING

05:20 pm
CLOSING REMARKS AND FAREWELL

- INRC Best Poster
- INRC/Brain Sciences PhD Award Ceremony

08:00 pm
GALA DINNER

■ **LOCATION**

Hotel Balneario Las Arenas 5* GL
Eugenia Viñes, 22, 24, 46011 Valencia

- Bus available. Route: from Hotel Melia to Hotel Las Arenas.
Ask Technical Secretariat for departure's time
- All attendance should bring the dinner ticket with you.

Important: Please notify your attendance “by clicking” the activity assistance at your web registration profile. Please notify before 1st July

PLENARY SPEAKER



Chris Evans
UCLA, Department
of Psychiatry

HOW DID IT COME TO BE, AND WHAT IS THE TRAJECTORY?

Short biography

Dr. Chris Evans received his graduate training in peptide chemistry at the UK Medical Research Council Research Institute in London. He then moved to Stanford University for his postdoctoral training with Dr. Jack Barchas where his research focused on the myriad of endogenous opioid peptides, confirming their existence, understanding precursor processing, and mapping the distribution of opioid peptides throughout the mammalian brain. In 1990, he moved to UCLA to begin his independent career that centered on continued research of the opioid system but focusing on the receptors. Currently, he is the Hatos Professor and Director of the Hatos Center for Neuropharmacology at UCLA. He has published extensively in opioid neuropharmacology including the identification of molecules constituting the endogenous opioid system. His interests are in the evolution of the opioid system, in using the conditional knockouts to identify circuits involved in opioid functions and creating effective drug outreach programs.



Brigitte Kieffer
INSERM/University
of Strasbourg France

OPIOID RECEPTORS: 30 YEARS INTO BRAIN FUNCTION

Short biography

Brigitte Kieffer is Research Director at INSERM U1114/Dpt Psychiatry at the University of Strasbourg, France and Adjunct Professor in the Dpt Psychiatry at McGill University, Montreal Canada. Dr. Kieffer isolated the first gene encoding an opioid receptor, opening an entire research field towards understanding the molecular basis of opioid-controlled behaviors. Her genetic dissection of the opioid system has brought major advances in pain, addiction and mood disorders research, as well as in the area of molecular pharmacology and G protein coupled receptor biology. She has received numerous awards, including the Lounsbury (French and US Academies of Science) and the Lamonica Award of Neurology (French Academy of Science); in 2014 she received the International L'OREAL-UNESCO Award for Women in Science (European Laureate) and was elected Member of the French Academy of Sciences.

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Robert W. Gereau
*Washington University
School of Medicine*

IMPLANTABLE WIRELESS SYSTEMS FOR THE STUDY AND TREATMENT OF PAIN, SUBSTANCE DISORDER, AND OVERDOSE

Short biography

Dr. Robert Gereau is the Dr. Seymour and Rose T. Brown Professor and Vice Chair for Research in the Department of Anesthesiology at Washington University

School of Medicine, where he also serves as Director of the Washington University Pain Center. His research program seeks to understand cellular and molecular changes that underlie chronic pain conditions, and to develop new medications and technologies for the treatment of pain. He was the recipient of the Frederick WL Kerr Award for Basic Science Research from the American Pain Society and the Landis Award for Outstanding Mentorship from NINDS. Gereau serves on the Board of Directors for the US Association for the Study of Pain, as a member or chair of several grant review panels, as Chair of the Board of Scientific Counselors for NIDCR, and as a member of advisory boards related to strategic planning for pain research and the NIH HEAL Initiative.

YOUNG INVESTIGATOR AWARD 2020



Ream Al-Hasani, PhD

HOW THE SUPPORT OF A SCIENTIFIC COMMUNITY ADVANCED MY RESEARCH

Short biography

Ream Al-Hasani is an Assistant Professor in the Center for Clinical Pharmacology at the University of Health Sciences & Pharmacy in St. Louis and Washington University

in St. Louis. She earned her BS(Hons) in Pharmacology from the University of Portsmouth. Dr. Al-Hasani focused her interests on addiction by pursuing a PhD in Neuropharmacology at the University of Surrey with Ian Kitchen and Susanna Hourani where she studied the involvement of adenosine A2 receptors in morphine and cocaine addiction. Dr. Al-Hasani completed her post-doctoral training in the Department of Anesthesiology at Washington University with Michael Bruchas where she used basic research models to dissect the role of the opioid circuitry in motivated behaviors. Dr. Al-Hasani identified two distinct subpopulations of dynorphinergic neurons within the nucleus accumbens that drive aversive and reward-

related behaviors. She also uncovered a novel role for GABAergic projection neurons from the ventral tegmental area to the ventral nucleus accumbens in reward reinforcement. This work was the basis for her Pathway to Independence Award (K99/R00) from the National Institute on Drug Abuse. Dr. Al-Hasani's current research focuses on better understanding opioid peptide release dynamics and function in mouse models of natural rewards and threats, during drug

withdrawal and following in utero exposure to opioids. Dr. Al-Hasani has also discovered a role for the kappa opioid system in cold hypersensitivity. Dr. Al-Hasani received the Cutting Edge Basic Research Award from the National Institute on Drug Abuse, the Young Investigator Award from the International Narcotics Research Conference and the Brain and Behavior Foundation Young Investigator Research Award.

YOUNG INVESTIGATOR AWARD 2021



Richard M. Van Rijn
*Department of Medicinal
 Chemistry
 and Molecular Pharmacology,
 Purdue University
 Septerna Inc,*

TOWARDS A TARGET CANDIDATE PROFILE FOR A G-PROTEIN-BIASED DELTA OPIOID AGONIST FOR THE TREATMENT OF ALCOHOL USE DISORDER

Short biography

Richard van Rijn received a bachelor and master's degree in Bio-pharmaceutical Sciences from Leiden University, and a PhD in molecular pharmacology of G-protein-coupled histamine receptors from VU university

Amsterdam. He expanded his GPCR skillset via a postdoctoral position at the Ernest Gallo Clinic and Research Center at UCSF, studying behavioral pharmacology of opioid receptors in relation to opioid and alcohol use disorder. In 2013, he joined the faculty of the Department of Medicinal Chemistry and Molecular Pharmacology at Purdue University. His research program, supported by multiple NIH grants, aimed to establish G-protein-biased delta opioid agonism as potential treatment for alcohol use disorder, mood disorder and chronic pain conditions. He obtained tenure in 2019, and performed a sabbatical in the research group of Dr. Shoichet at UCSF to acquire skills in large-scale docking of virtual drug libraries. In 2021, he was recruited by Septerna to aid their GPCR-focused drug discovery programs.

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INRC YOUNG INVESTIGATOR AWARD 2022



John M. Streicher
*Department of
Pharmacology, College of
Medicine,
University of Arizona,
Tucson AZ USA*

THE ORGANIZATION OF MU OPIOID RECEPTOR SIGNAL TRANSDUCTION CASCADES IN THE SPINAL CORD BY HEAT SHOCK PROTEIN 90

Short biography

John Streicher is an Associate Professor in the Department of Pharmacology, College

of Medicine, at the University of Arizona. His research program focuses mainly on the molecular mechanisms of signal transduction by the opioid and cannabinoid receptors in pain, while using these mechanisms to design novel drug discovery strategies for analgesic drugs with a better efficacy and side effect profile than opioids. He earned his B.S. from George Fox University in 1999, his M.S. from Oregon Health and Science University in 2002, and his Ph.D. from University of California – Los Angeles in 2009. His postdoctoral training was with Laura Bohn at The Scripps Research Institute from 2009 – 2012. His first faculty position was at the University of New England in 2012, and he joined the University of Arizona in his current position in 2015.

FOUNDER'S LECTURE



Fred Nyberg
*Faculty of Pharmacy, Uppsala, University
P.O. Box 591, S-751 24
UPPSALA, Sweden*

FROM CSF TO REVERSAL OF OPIOID-INDUCED DAMAGES TO THE BRAIN

Short biography

Fred Nyberg is currently active as Senior Professor at the Dept of Pharmaceutical Biosciences at Uppsala University. He received his PhD in 1981 on a thesis directed to pituitary polypeptide hormones, and subsequently performed postdoc studies on

opioid peptides in relation to chronic pain and opioid addiction. In 1993 he was appointed as Full Professor in Addiction Biology. Between 2002-2007 he served at the Swedish Government as Head of Research Issues at the National Drug Policy Coordinator and during 2008-2017 he was a member of the Advisory Board on addictive drugs at the Social Ministry. He was Chairman for his Department 1999-2006, and from 2006 to 2011 Dean at the Faculty of Pharmacy, Uppsala University. He is an active member of INRC since 1982 and served as president for the organization 2014-2018. Nyberg's field of research includes aspects on peptidergic mechanisms in chronic pain and drug dependence but it also extends to areas related to neuroendocrinology, neurology and psychiatry. He has over 450 publications in internationally well-recognized research journals.

**Christoph Stein**

Charité Universitätsmedizin
Berlin, Germany
Freie Universität Berlin,
Germany

**PAIN INHIBITION VIA PERIPHERAL
OPIOID RECEPTORS*****Short biography***

Christoph Stein (orcid.org/0000-0001-5240-6836) studied Medicine at Ludwig-Maximilians-University (LMU) München, Germany, and received training in Anesthesiology (Klaus Peter, James Cottrell), Pain Medicine (Wilbert Fordyce, John Liebeskind) and Neuropharmacology

(Albert Herz) at State University of New York, University of California Los Angeles, LMU and Max-Planck Institute for Psychiatry (München, Germany). He then accepted a faculty position at Johns Hopkins University and established a research group at the National Institute on Drug Abuse (Baltimore, USA). In 1997 he assumed the Chair of Anaesthesiology and Intensive Care Medicine at Freie Universität Berlin, Germany (since 2003: Charité Campus Benjamin Franklin) and built an interdisciplinary research laboratory including neuroscientists, pharmacologists and clinicians. His work has focused on mechanisms underlying opioid analgesic effects outside the central nervous system with the aim to avoid adverse side effects.

POSTERS

SESSION POSTER 1

14. **FUNCTIONAL SELECTIVITY OF KAPPA OPIOID RECEPTOR: FOCUS ON ENDOGENOUS AGONISTS**
Luca, Zangrandi, *Charitém Austria*
54. **DELTA OPIOID RECEPTORS IN CANNABIDIOL ANTIALLODYNIC, ANXIOLYTIC AND ANTIDEPRESSANT EFFECTS**
Gaborit, Marion, *INCI-CNRS, France*
72. **EVALUATION OF SYNERGISTIC EFFECTS BETWEEN THC AND MORPHINE AND THE POSSIBLE MOR-CB1 HETEROMERIZATION IN HUMAN CELL MODELS CO-EXpressING MOR AND CB1**
Elisabetta, Cuna, *Dept. Pharmacy and Biotechnology - University of Bologna, Italy*
83. **EXPLORING THE SIGNALLING BIAS AND EFFICACY OF CARFENTANIL**
Nokomis Ramos-Gonzalez, Nokomis, *University of Bristol, United Kingdom*
91. **AN ELECTROCHEMICAL APPROACH FOR SELECTIVE AND SENSITIVE DETECTION OF OPIOID PEPTIDES**
Sineadh, Conway, *Anesthesiology, United States*
98. **IN SILICO-BASED MOLECULAR CHARACTERIZATION OF SELECTED G PROTEIN-BIASED AGONISTS OF MU OPIOID RECEPTOR**
Sabina, Podlewska, *Maj Institute of Pharmacology, Polish Academy of Sciences (IF PAS), Poland*
101. **KAPPA RECEPTOR PARTIAL AGONISTS INACTIVATE KOR THROUGH A JNK/ROS MECHANISM**
Carlie, Neiswanger, *University of Washington - Department of Pharmacology, United States*
28. **MU OPIOID RECEPTORS IN VGLUT2-EXpressING GLUTAMATERGIC NEURONS MODULATE OPIOID AVERSION**
Kaitlin, Reeves, *Indiana University School of Medicine, United States*
50. **DORSAL HIPPOCAMPUS ACTIVATION OF ACCUMBAL DYNORPHIN NEURONS DRIVE REINFORCEMENT.**
Khairunisa, Ibrahim, *Washington University in St. Louis, United States*
76. **KAPPA OPIOID RECEPTOR CURRENTS IN MOUSE PARAVENTRICULAR THALAMUS**
Eloise, Kuijer, *University of Bath, United Kingdom*
79. **TEMPORAL DYNAMICS OF LOCUS COERULEUS MODULATION OF STRESS-INDUCED ANTINOCICEPTION**
Makenzie, Norris, *Center for Clinical Pharmacology, United States*
89. **MU-OPIOID RECEPTOR ACTIVATION IN THE VENTRAL TEGMENTAL AREA AND ITS IMPACT ON MICROGLIAL PROLIFERATION: ROLE OF INFLAMMATORY PAIN**
David, Meseguer, *Faculty of Pharmacy - University of Valencia, España*
106. **ACUTE STRESS SHIFTS KAPPA-OPIOID RECEPTOR FUNCTION FROM INHIBITORY TO EXCITATORY IN A SUBSET OF VTA DOPAMINE NEURONS**
Elyssa, Margolis, *UCSF, United States*
Nazzareno, Cannella, *School fo Pharmacy, University of Camerino, Italy*

122. **HETEROGENOUS TOLERANCE TO SNC-80 AT SOMATIC AND PRESYNAPTIC DELTA OPIOID RECEPTORS IN THE ANTERIOR CINGULATE CORTEX**
Marie, Walicki, *University of Michigan, United States*
124. **ROLE OF RMTG (TAIL OF THE VTA) ON THE ETHANOL-DERIVED ACTIVATION OF VTA-DA NEURONS.**
Claudia, Esposito, *Universitat de Valencia, España*
37. **INFLUENCE OF PSYCHEDELIC PSILOCYBIN ON OXYCODONE-INDUCED CONDITIONED PLACE PREFERENCE IN C57BL/6 MALE AND FEMALE MICE**
Alaina, Jaster, *Virginia Commonwealth University, United States*
74. **ADS012, A SINGLE STRAIN LIVE BIOTHERAPEUTIC PRODUCT, ATTENUATES TOLERANCE TO REPEATED MORPHINE DOSING IN MICE**
Chesnel, Laurent, *Adiso Therapeutics, United States*
81. **IMPACT OF $\Delta 9$ -TETRAHYDROCANNABINOL ADMINISTRATION ON MEASURES OF OXYCODONE-INDUCED ANTINOCICEPTION, DEPENDENCE AND REWARD**
Richard, Slivicki, *Washington University, United States*
93. **AKAP150 PRIMES PACLITAXEL-INDUCED PERSISTENT PAIN BY SYNCHRONIZING PKA AND PKC α ACTIVATION**
Ying, He, *University of Illinois at Chicago, United States*
112. **NIH HETEROGENEOUS STOCK RATS TRAINED TO HEROIN SELF-ADMINISTRATION SHOW HETEROGENEOUS RESPONSE TO THE ANTI-ADDICTIVE EFFECTS OF THE MOP/NOP AGONIST CEBRANOPADOL**
Nazzareno, Cannella, *School fo Pharmacy, University of Camerino, Italy*
128. **NEW NOSE-TO-BRAIN LIPOSOMAL PHARMACEUTICAL FORMULATION TARGETING THE KAPPA OPIOID RECEPTOR**
Lucia, Hipolito, *Universitat Valencia, España*
38. **HELPING KIDS PROSPER IN UTAH: AN EVIDENCE-BASED, COMMUNITY APPROACH TO PREVENTION**
Claire, Warnick, *Utah State University, United States*
90. **ETHANOL-INDUCED DOPAMINE RELEASE IN THE NUCLEUS ACCUMBENS CORE IN PRE-EXPOSED ANIMALS TO ALCOHOL: ROLE OF INFLAMMATORY PAIN**
Ana, Riera, *Faculty of Pharmacy, University of Valencia, España*
100. **OREXIN-RECEPTOR ANTAGONIST EFFECTS ON SLEEP AND STRESS DURING OPIOID WITHDRAWAL: A RANDOMIZED-CONTROLLED TRIAL**
Andrew, Huhn, *Johns Hopkins University, United States*
110. **OPIOID USE DISORDER IS ASSOCIATED WITH ALTERATIONS IN CIRCADIAN PATHWAYS: PROTEOMICS ANALYSIS OF HUMAN POSTMORTEM BRAINS.**
Stephanie, Puig, *Boston University School of Medicine, United States*
111. **LONG ACCESS HEROIN SELF-ADMINISTRATION INDUCES GREY MATTER VOLUME REDUCTION IN NIH HETEROGENEOUS STOCK RATS.**
Nazzareno, Cannella, *School fo Pharmacy, University of Camerino, Italy*
126. **THE INFLUENCE OF THE GUT MICROBIOTA DURING OPIOID WITHDRAWAL**
Julia, Nickols, *University of Alberta, Canada*
127. **HIPPOCAMPAL MU OPIOID AND CANNABINOID 1 RECEPTORS ARE MODULATED FOLLOWING COCAINE SELF-ADMINISTRATION IN MALE RATS**
Befort, Katia, *Université de Strasbourg, CNRS, UMR7364, France*

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138. **OXYTOCIN AND OREXIN SYSTEMS BIDIRECTIONALLY REGULATE THE ABILITY OF OPIOID CUES TO BIAS CHOICE DURING RELAPSE**
Giuseppe, Giannotti
52. **SEX DIFFERENCES IN EPIGENETIC MECHANISMS OF OPIOIDS**
Falconnier Camille, Falconnier, *INCI CNRS UPR 3212, France*
71. **PREDICTION OF MORPHINE AND PREGABALIN THERAPEUTIC CONCENTRATIONS AT THE BRAIN EXTRACELLULAR FLUID AND EVALUATION OF THEIR EFFECTS ON NEURONAL GENE EXPRESSION OF TARGETS INVOLVED IN PAIN AND ANALGESIA**
Andrea, Bedini, *Dept. Pharmacy and Biotechnology - University of Bologna, Italy*
70. **EXAMINING THE ASSOCIATION OF CHRONIC PAIN, GENDER, AND OPIOID WITHDRAWAL SEVERITY DURING THE FIRST WEEK OF TREATMENT**
Orrin, Ware, *Johns Hopkins University School of Medicine, United States*
95. **ALTERATIONS IN ASTROCYTES AND THE GLUTAMATE TRANSPORTER GLT-1 IN THE PREFRONTAL CORTEX INDUCED BY INFLAMMATORY PAIN: SEX PERSPECTIVE**
Paula, Andrés, *Faculty of Pharmacy, University of Valencia, España*
125. **OPIOID ANALGESIA IN A MODEL OF PAIN-DEPRESSED BEHAVIOR IN MICE: ROLE OF MU OPIOID RECEPTOR AGONIST EFFICACY**
Steve, Negus, *Virginia Commonwealth University, United States*
133. **HYDROGEN SULFIDE INCREASES THE ANTIALLODYNIC EFFECTS OF MORPHINE IN ANIMALS WITH NEUROPATHIC PAIN**
Olga, Olga, *Institut d'Investigació Biomèdica Sant Pau (IIB Sant Pau), España*
53. **DOES MICROGLIA-ASTROCYTE CROSSTALK ORCHESTRATE SEX DIFFERENCES IN MORPHINE CENTRAL METABOLISM AND ITS ANTINOCICEPTIVE EFFECTS?**
Volodya ,HOVHANNISYAN. *Institut des Neurosciences Cellulaires et Intégratives, France*
61. **PAIN-DEPRESSED CLIMBING AND AGONIST/ANTAGONIST OPIOID MIXTURES IN MALE AND FEMALE MICE AS TOOLS FOR ANALGESIC DRUG DEVELOPMENT**
Edna, Santos, *VCU. United States*
137. **AUTOPHAGY INDUCTION VIA K-OPIOID RECEPTOR IS IMPLICATED IN STRESS-DRIVEN SYNAPTIC ALTERATIONS**
Christos, Karoussiotis *Greece*
131. **CHARACTERIZATION OF TWO SUBPOPULATIONS IN A COHORT OF FEMALE WISTAR RATS: A GENDER STUDY UNDER THE ADE MODEL**
Sandra, Fernández, *University of Valencia, España*
57. **NEGATIVE AFFECT IS ASSOCIATED TO OPIOID MEDICATION MISUSE: A TRANSVERSAL STUDY IN NON-CANCER CHRONIC PAIN PATIENTS**
Lucia, Hipólito. *Universitat Valencia*

SESSION POSTER 2

68. **POSITIVE ALLOSTERIC MODULATION OF THE MU OPIOID RECEPTOR: STUDIES IN VIVO**
Kelsey, Kochan, *University of Michigan, United States*
80. **KINETICS OF FENTANYLS AND NITAZENES BINDING TO THE MU OPIOID RECEPTOR**
Norah Alhosan, Norah, *UoB, United Kingdom*

87. **STRUCTURE, FUNCTION, AND PHARMACOLOGY OF DELTA OPIOID RECEPTOR BITOPIC LIGANDS**
Sarah, Bernhard, *Washington University in St. Louis, United States*
96. **OPIOID EFFECTS ON OXIDATIVE STRESS AND PROTEASOME ACTIVITY IN HUMAN NEUROBLASTOMA SH-SY5Y CELLS**
Patrizia, Romualdi, *Dept. Pharmacy & Biotechnology, Italy*
99. **ADDICTION-RELATED BEHAVIORAL EFFECTS OF G PROTEIN-BIASED AGONISTS OF THE M-OPIOID RECEPTOR**
Lucja, Kudla, *Maj Intitute of Pharmacology, Polish Academy of Sciences, Poland*
117. **THE GI-PROTEIN COUPLED RECEPTORS MOR AND GPR151 CONTRIBUTE TO SOCIAL REWARD IN THE HABENULA**
Allain, Florence, *INSERM, France*
121. **MOTOR CORTEX STIMULATION-INDUCED ANTINOCICEPTION REQUIRES ENDOGENOUS OPIOID SIGNALING**
Nicole, Mercer, *Stanford University, United States*
136. **INFRARED AND NEAR-INFRARED FLUORESCENT OPIOID ANTAGONISTS: ALTERNATIVE TO RADIOLIGAND BASED ASSAYS**
Brian, Reed, *Rockefeller University, United States*
33. **CONTRIBUTION OF THE CENTRAL AMYGDALA TO PAIN HYPERSENSITIVITY IN A MOUSE MODEL OF MULTIPLE SCLEROSIS**
Zoë, Dworsky-Fried, *University of Alberta, Canada*
59. **MU OPIOID RECEPTOR-MEDIATED EFFECTS OF MOR AGONISTS ON WHOLE BRAIN FUNCTIONAL CONNECTIVITY IDENTIFIED BY MOUSE FMRI.**
Darcq, Emmanuel, *INSERM, France*
69. **DISSECTING THE ACCUMBAL DYNORPHINERGIC OUTPUTS UNDERLYING AFFECTIVE PAIN**
Nicolas, Massaly, *Washington University in St Louis, United States*
77. **DISSECTING THE EFFECT OF STRESS ON ENDOGENOUS NOCICEPTIN CIRCUITRY IN THE VENTRAL TEGMENTAL AREA**
Carolyn, Stine, *University of Washington, United States*
86. **CHRONIC MORPHINE DIFFERENTIALLY ALTERS OPIOID EFFICACY AT SOMATIC AND PRESYNAPTIC MORNS WITHIN A THALAMO-CORTICO-STRIATAL MICROCIRCUIT**
Elizabeth, Jaeckel, *University of Michigan, United States*
97. **MU-OPIOID RECEPTORS IN THE BNST MEDIATE MORPHINE ANTINOCICEPTION**
Arbi, Nazarian, *WesternU, College of Pharmacy, United States*
104. **UNCOVERING THE RELEASE DYNAMICS OF ENKEPHALINS FOLLOWING ACUTE STRESS**
Marwa, Mikati, *Washington University in St. Louis, United States*
108. **PAIN-ASSOCIATED FENTANYL INTAKE IN MALES IS DRIVEN BY DYAMIC ACTIVITY OF VENTRAL TEGMENTAL AREA DOPAMINE NEURONS**
Jessica, Higginbotham, *Washington University, United States*
119. **UNCOVERING THE DYNORPHINERGIC PROJECTION OF CENTRAL AMYGDALA TO NUCLEUS ACCUMBENS: ROLE ON PAIN-INDUCED NEGATIVE AFFECT.**
Jesús David, Lorente, *Department of Pharmacy and Pharmaceutical Technology. University of Valencia, España*

120. **INFLAMMATORY PAIN INDUCES ANXIETY- AND ANHEDONIA-LIKE BEHAVIOR IN A SEX-DEPENDENT MANNER: ROLE OF DYNORPHINERGIC AND CORTICOTROPIN-RELEASING SYSTEMS IN THE MCLs.**
Jesús David, Lorente, Department of Pharmacy and Pharmaceutical Technology. University of Valencia, España
139. **Ventral pallidal perineuronal nets regulate opioid relapse**
Carley N., Miller
60. **STRUCTURE ACTIVITY RELATIONSHIPS OF FENTANYL ANALOGS**
Jessica, Anand, University of Michigan, United States
66. **NEW SYNTHETIC OPIOIDS USE AMONG PATIENTS IN TREATMENT FOR AN OPIOID USE DISORDER IN BARCELONA**
María, Alías, IMIM, España
78. **SEX DIFFERENCES IN THE ROLE OF CNH3 IN OPIOID SEEKING**
Tania, Lintz, Washington University in St. Louis, United States
85. **EXPLORING GPR171 AGONISTS AS NOVEL PAIN THERAPEUTICS**
Max, McDermott, Utah State University, United States
107. **PPL-138: A BIFUNCTIONAL NOP/MU PARTIAL AGONIST THAT REDUCES COCAINE SELF-ADMINISTRATION IN RATS**
Madeline, Martinez, Florida Atlantic University, United States
114. **TARGETING PDGFR-BETA TO MAKE OPIOID PRESCRIPTIONS SAFER**
Luca, Posa, Boston University, United States
129. **PHOSPHOLIPASE CGAMMA1 IN THE NUCLEUS ACCUMBENS ALTERS HEROIN-SEEKING BEHAVIOR**
Ethan, Anderson, Medical University of South Carolina, United States
45. **ADMINISTRATION OF HUMAN MESENCHYMAL STEM CELLS-DERIVED SECRETOME MARKEDLY INHIBITS ORAL MORPHINE SELF-ADMINISTRATION AND BLOCKS RELAPSE IN TWO RAT MODELS OF MORPHINE DEPENDENCE**
Fernando, Ezquer, Center for Regenerative Medicine, School of Medicine, Universidad del Desarrollo, Chile
92. **SYSTEMIC AND INTRANASAL ADMINISTRATION OF MESENCHYMAL STEM CELL-DERIVED SECRETOME REDUCES THE WITHDRAWAL SYNDROME CAUSED BY OPIOID ADMINISTRATION IN RATS**
Mauricio, Quezada, Universidad del Desarrollo, Chile
51. **POSITIVE AND NEGATIVE REINFORCEMENT AMONG LONG-TERM HEROIN USERS: ASSESSMENT OF SUBJECTIVE EXPERIENCE OF HEROIN EFFECTS AS A SURROGATE MEASURE**
Suky, Martinez, Columbia University, United States
65. **EVIDENCE FOR HEROIN-INDUCED SOCIAL ISOLATION IN THE RAT**
Ginevra, D'Ottavio, Sapienza University of Rome, Italy
102. **INSOMNIA IS ASSOCIATED WITH PREMATURE TREATMENT DISCONTINUATION AND DEPRESSIVE SYMPTOM SEVERITY IN PERSONS ENTERING TREATMENT FOR OPIOID USE DISORDER**
Jennifer D Ellis, Jennifer, Johns Hopkins School of Medicine, United States

109. **HEROIN-NAÏVE NIH HETEROGENEOUS STOCK RATS VULNERABLE TO OPIOID USE DISORDERS SHOW REDUCED RESPONSE TO THE ANALGESIC EFFECT OF HEROIN**
Nazzareno, Cannella, *School of Pharmacy, University of Camerino, Italy*
115. **THE ENDOCANNABINOID ENZYME NAPE-PLD REGULATES ANXIETY-LIKE BEHAVIORS AND THE REINFORCING PROPERTIES OF ORAL OXYCODONE CONSUMPTION IN MICE**
Taylor Woodward, Taylor, *IU Bloomington, United States*
116. **HEALING PLACES, HEALING PEOPLE: INSIGHTS ON SPONTANEOUS CRITICAL PLACE-MAKING FROM AN OPIATE SUBSTITUTE THERAPY PROGRAMME IN DURBAN, SOUTH AFRICA**
Michael, Wilson, *Bellhaven Harm Reduction Centre, South Africa*
132. **WHAT IS THE THERAPEUTIC BLOOD LEVEL OF NALTREXONE FOR OUD TREATMENT?**
Felipe, Castillo, *NYSPI/Columbia University, United States*
62. **NO EVIDENCE OF ACCELERATED EPIGENETIC AGING AMONG BLACK HEROIN USERS: A CASE VS CONTROL ANALYSIS.**
Jermaine, Jones, *Columbia University College of Physicians and Surgeons, United States*
88. **DEVELOPMENT OF NOVEL THERAPEUTIC TARGETS FOR THE TREATMENT OF OPIOID INDUCED HYPERALGESIA.**
Elizaveta, Mangutov, *UIC, United States*
105. **CYCLO-GLYCOPEPTIDE DRUGS FOR PAIN MANAGEMENT: OPIOID AND NON-OPIOID EXAMPLES**
Robin, Polt, *Chemistry & Biochemistry, BIO5, United States*
130. **HYDROGEN SULFIDE ENHANCES THE ANALGESIC PROPERTIES OF DELTA OPIOID RECEPTORS DURING INFLAMMATORY PAIN**
Olga, Olga, *Institut d'Investigació Biomèdica Sant Pau (IIB Sant Pau), España*
82. **CHARACTERISATION OF CARFENTANIL DEPRESSION OF RESPIRATION IN MICE**
Damiana Cavallo, Damiana, *University of Bristol, United Kingdom*
75. **DISRUPTION OF VAGAL-BRAINSTEM CONNECTIONS DOES NOT ALTER FENTANYL-INDUCED RESPIRATORY DEPRESSION**
Brian Ruyle, Brian, *Washington University in St Louis, United States*
84. **EFFECTS OF COCAINE ON OXYCODONE- AND FENTANYL-INDUCED VENTILATORY DEPRESSION IN MICE**
Harrison Elder, Harrison, *Virginia Commonwealth University, United States*
118. **CHRONIC NALTREXONE THERAPY IMPROVED CARDIAC FUNCTION IN VOLUME OVERLOAD-INDUCED HEART FAILURE**
Schaefer, Michael, *Anaesthesiology, Charité University Berlin, Germany*
113. **MARCHIGIAN SARDINIAN ALCOHOL PREFERRING RATS SHOW INCREASED HEROIN SELF-ADMINISTRATION AND MOTIVATION COMPARED TO NON-PREFERRING WISTAR RATS: INVESTIGATING THE ROLE OF THE NOP/MOP SYSTEM.**
63. **OPIOID WITHDRAWAL POTENTIATES SYNAPTIC OUTPUT FROM THE VENTRAL PALLIDUM TO THE LATERAL HABENULA**
Jessica, Tooley, *Washington University in St. Louis, United States*
67. **INVESTIGATING SPATIO-TEMPORAL BIAS AT THE MU-OPIOID RECEPTOR**
Rebecca, Annells, *University of Bath, United Kingdom*

INRC²⁰²²

RELEVANT INFORMATION

- **VENUE:**
Hotel Melia Valencia 4*
Avda. Cortes Valencianas, 52. 46015 Valencia
- **PLENARY SESSIONS:** Valentia B + C (Main room)
- **POSTER SESSION:** Valentia A room
- **MENTORING ACTIVITIES:** Terra room
- **COFFE BREAK:** Hall of Hotel
- **CONFERENCE PROGRAM LUNCHES:** Terra room
- **SOCIAL EVENTS:**

WELCOME

Monday, 4th July. 07:00-08:00 pm

Melia Valencia 4* (at the Hall)

INRC BAR

Wednesday, 6th July 08:30-09:30 pm

Àtic-Palau Alameda

Calle de Muñoz Seca, 1. 46010 Valencia

No ticket need

GET TOGHETER

Thrusday, 7th July 08:00-09:30 pm

Restaurante Contrapunto Les Arts

Av. del Profesor López Piñero, 1. 46013 Valencia

GALA DINNER

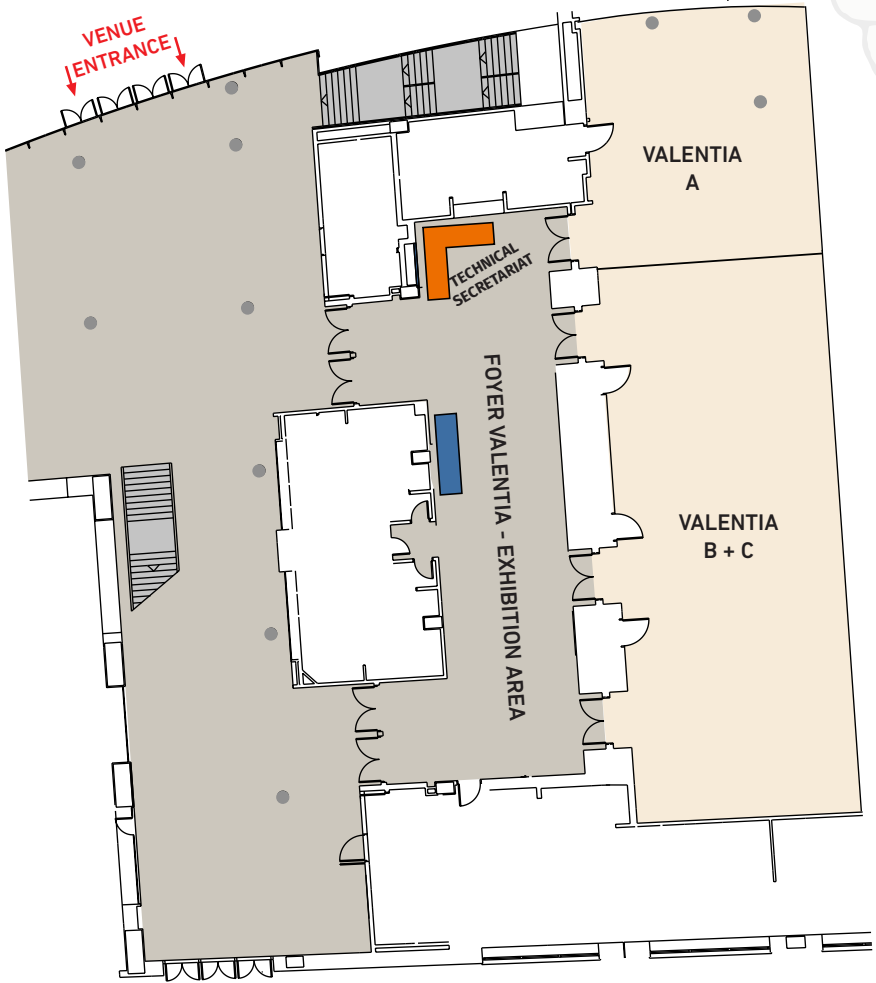
Friday, 8th july, 08:30 pm

Hotel Balneario Las Arenas 5*

Calle Eugenia Viñes, 22, 24. 46011 Valencia

- Bring the gala dinner with you.
- Ask to Technical Secretariat (registration point) for the bus departure.

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INRC 2022

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