



ISSR 2018

*Serotonin on the
Wild Atlantic Way*



UCC

University College Cork, Ireland
Coláiste na hOllscoile Corcaigh

The 19th Meeting of the International Society for
Serotonin Research

Serotonin on the 'WILD ATLANTIC WAY'

University College Cork

Ireland

15th - 18th July 2018



Meeting Handbook



ISSR 2018
*Serotonin on the
Wild Atlantic Way*



19th Meeting of International Society for Serotonin Research

University College Cork, Cork, Ireland

July 15th-18th 2018

Sponsors

This conference would not have been possible without the generous support of our sponsors and local partners which has enabled the 19th Meeting of the International Society for Serotonin Research meeting, July 2018 to be such a success.



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2017

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North America

2017

Meagan Quinlan, Florida Atlantic University Brain Institute

Rest of the World

Open position

Webmaster

2017-present

T. Lee Gilman, University of Texas Health Science Center at San Antonio

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Siobhain O' Mahony, University College Cork
Meagan Quinlan, Florida Atlantic University Brain Institute
Harriët Schellekens, University College Cork
Trevor Sharp, Oxford University
Mariano Soiza-Reilly, Institut du Fer à Moulin
Carlos M. Villalón, Cinvestav-IPN (Unidad Sur)
Noelia Weisstaub, Instituto de Neurología Cognitiva y CONICET
Mitsohiro Yoshioka, Hokkaido University School of Medicine

Local Organising Committee Welcome



On behalf of the entire local organizing committee I want to wish you “Céad Mile Fáilte”, a hundred thousand welcomes to Ireland and to University College Cork for the ISSR Meeting “Serotonin on the Wild Atlantic Way”. We hope that you enjoy the exciting week of science and culture that is planned here in Cork.

Cork is the second largest city in the Republic of Ireland with a unique character and is very much a University city with both ‘Town and Gown’ very integrated. Thus, we are especially delighted that the conference will be held here in University College Cork (UCC). I hope you have time to see some of the key sites of the campus whose main buildings were built in the 1840s at the height of the Irish Famine. These include the Stone Corridor, the Honan Chapel with its Harry Clarke stained glass windows and the Glucksman Gallery. Check out the Boole Window in the Aula Maxima commemorating George Boole, the father of computer science was first professor of Mathematics in UCC. This summer there is a replica mud cabin - An Bothán - to serve as a stark reminder of how the poorest live, and died, during the Great Irish Famine of 1845 to 1852 recreated near the Quadrangle.

It was at the ISSR meeting in South Africa in 2014 that Harriet Schellekens & I had the idea of bringing the meeting to Cork but it wouldn’t have been realized without the tremendous efforts of many others too. The saying goes it takes a village to raise a child well it definitely takes one to organize a successful conference. I’d like to thank all members of the LOC & ISSR committees who campaigned for sponsorship, helped with all of the logistics and organized the abstracts. A special big shout-out needs to go to Siobhain O’Mahony & Ger Clarke for all their trojan efforts these past months; to Olivia O’Leary for excellent work in curating the abstracts; Bereniece Riedewald for assistance with programme books & signage and to Kelly Berg for always being there with an answer.

Thanks also to all those in my Dept. & lab who are giving much of their time to ensure the conference is a success.

Finally, we hope you get a chance to enjoy the unique Irish landscape and as the tourist by-lines say “*Leave the ordinary elsewhere, and embrace the Wild Atlantic Way of life*”

Mise le Meas

A handwritten signature in black ink that reads "John F. Cryan". The signature is written in a cursive style with a long horizontal line extending from the end.

John F. Cryan

Chair Local Organising Committee

Organising Committee



ISSR 2018
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The 19th Meeting of International Society for Serotonin Research
University College Cork
Organising Committee welcomes you



Professor John F. Cryan

Professor & Chair, Department of
Anatomy & Neuroscience,
University College Cork



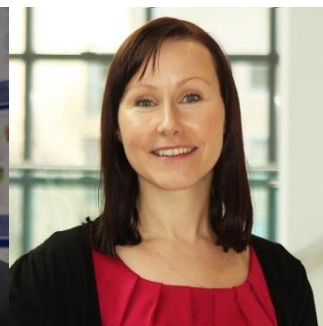
Dr. Harriët Schellekens

Lecturer, Department of Anatomy
and Neuroscience, University
College Cork



Dr. Gerard Clarke

Lecturer, Department of
Psychiatry and Neurobehavioural
Science, University College Cork



Dr. Siobhain O'Mahony

Lecturer, Department of Anatomy
and Neuroscience, University
College Cork



Dr. Olivia O'Leary

Lecturer, Department of Anatomy
and Neuroscience, University
College Cork



Professor Ted Dinan

Professor of Psychiatry,
Department of Psychiatry and
Neurobehavioural Science,
University College Cork



Professor Kevin Fone

Professor of Neuroscience,
University of Nottingham



Professor Kelly Berg

Department of Pharmacology,
UT Health, San Antonio, Texas



Dr. Madeleine King

Senior Research Fellow,
School of Life Sciences,
University of Nottingham



Dr. Jana Haase

Lecturer, School of Biomolecular
& Biomed Science, University
College Dublin



Professor Trevor Sharp

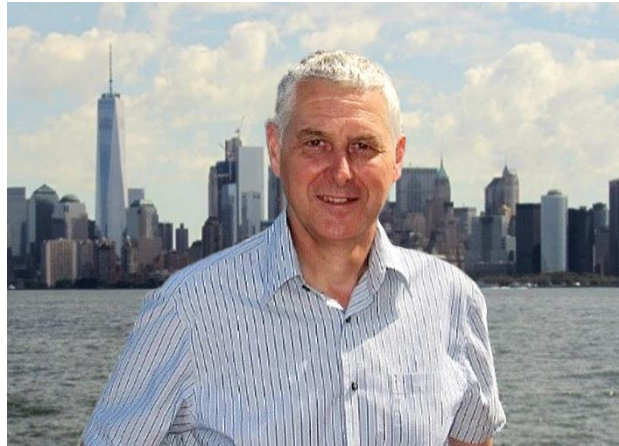
Professor of Neuropharmacology
University of Oxford



**Dr. Susan Rafferty-
McArdle**

APC Operations Manager,
University College Cork

ISSR President's Welcome



A warm welcome from the President of the International Society for Serotonin Research

It gives me great pleasure to welcome you all to the 19th meeting of the International Society for Serotonin Research, thirty-one years since the foundation of our Society. The meeting will be in the wonderful green city of Cork in the south of Ireland.

The program includes some of the leading serotonin researchers in the world, focusing on serotonin neuroanatomy, neuropharmacology, receptor function, and its role in disease. In addition to our three plenary lectures a particularly exciting aspect is the inclusion of fifteen highly talented graduate students and postdocs, selected on the basis of their abstracts, CV's and supervisor's recommendation to present in special "Pioneers and Prodigies" sessions. We have chosen 14 parallel symposia to maximise the number of active participants and also introduced two themed sessions "The gut-brain-microbiome axis" and "5-HT receptor signalling and heteromerization" to focus on these current and exciting topics on Tuesday morning. An evening poster session is scheduled for Monday, all posters will remain on display throughout the meeting.

I am sure this meeting will show us just how far science has advanced since the discovery that post-mortem serotonin levels were decreased in depressed suicide patients. This observation resulted in the development of the first selective serotonin receptor inhibitor ([LY110140](#), fluoxetine, 1974) by David Wong and his colleagues, including Ray Fuller who was one of the founding members of our society.

The program also includes several social events commencing with the melodic tones of the bag pipes guiding you to our Opening Reception. This takes place on Sunday from 5:30pm in the Aula Maxima, which was described in 1849 by The Cork Examiner as 'one of the most magnificent rooms in Ireland'. We hope this will enable interactions between members of the serotonin family. This is followed by a Young Scientists Evening beginning at 'The Oval' which is on the Cork Heritage Pubs Trail and always a safe bet for a good pint of Cork's own Beamish stout (older serotonin metabolites are of course also welcome).

A lunchtime trip to Blarney Castle is planned for Monday (be careful the 'Stone of Eloquence' is not for the faint hearted or those with fused vertebrae). Tuesday evening will see us discovering a local Franciscan Brewery. The meeting will close with a Pre-Dinner Reception in Cork County Hall and Gala Dinner in dual venues, The Kingsley Hotel and 'Vertigo' - the roof top pavilion restaurant of Cork County Hall.

We are very grateful to all our sponsors whose assistance is essential to enable this meeting to be a success. The theme of the 2018 meeting is "Serotonin on the Wild Atlantic Way" and a visit to Cork will give you a unique opportunity to extend your conference stay and explore the beautiful Irish coastline and towns. I am looking forward to seeing you in Ireland and hope you have a wonderful meeting.

Yours sincerely

Kevin C.F Fone

President of ISSR

Travel Award Recipients



ISSR 2018
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BRITISH
PHARMACOLOGICAL
SOCIETY



ACS Chemical
Neuroscience

Melodi A. Bowman, University of Texas Health Science Center, San Antonio, TX, USA

Danilo De Gregorio, McGill University, Montreal, QC, CA

Lauren J. Donovan, Case Western Reserve University, Cleveland, OH, USA

Raul Garcia, Arizona State University, Tempe, AZ, USA

T. Lee Gilman, University of Texas Health Science Centre, San Antonio, TX, USA

Evgeny Ivashkin, Karolinska Institutet, Stockholm, SE

Felix P. Mayer, Medical University of Vienna, Vienna, AT

John McCorvy, University of North Carolina, Chapel Hill, NC, USA

Franziska E. Müller, Hannover Medical School, Hannover, DE

Broc A. Pagni, Arizona State University, Tempe, AZ, USA

Meagan A. Quinlan, Vanderbilt University, Nashville, TN, USA

Anouschka S. Ramsteijn, University of Groningen, Groningen, NL

Ayesha Sengupta, National Institute on Alcohol Abuse and Alcoholism, Rockville, MD, USA;

Farank Vahid-Ansari, University of Ottawa, Ottawa, ON, CA



Biochem Society Travel Award Recipient

Chandan K. Behera, University of Ulster Magee campus, Londonderry, UK



ASPET-Molecular Pharmacology Division Travel Award Recipients:

Mike Bauman, National Institute on Drug Abuse, Baltimore, MD, USA

Kelly Berg, University of Texas Health Science Center at San Antonio, San Antonio, TX, USA

Kyra Clarke, University of Texas Health Science Center at San Antonio, San Antonio, TX, USA

Kathryn Cunningham, University of Texas Medical Branch, Galveston, TX, USA

Greg Fink, Michigan State University, East Lansing, MI, USA

Chuck Nichols, Louisiana State University Health, New Orleans, LA, USA

Sunday July 15, 2018		Monday July 16, 2018	
7:00	<p>Internet Access</p> <p>SSID(NetworkName): UCC Guests</p> <p>Username: issr-aug-2018</p> <p>Password: Azb8ssxr</p>	<p>Travel Award Breakfast in River Lee Hotel (invitation only) 07:00 - 08:00</p>	
07:30		<p>Parallel Symposia 1 /2</p> <p>Andrews Maasen van den Brink Boole 1 Boole 2</p> <p>08:00 - 09:30</p>	
8:00			
8:30		<p>Coffee Break in Devere 30 min</p>	
9:00			
9:30		<p>Parallel Symposia 3/4</p> <p>Sitte/Daws Watts Boole 1 Boole 2</p> <p>10:00 - 11:30</p>	
10:00			
10:30		<p>BLARNEY CASTLE TRIP (with packed lunch-collect from Devere) 2 hours 30 mins (15 mins by bus-embark on Donovan's rd-close to Devere) 11.30- 14:00</p>	
11:00			
11:30			
12:00			
12:30		<p>Parallel Symposia 5/6</p> <p>Deneris/Neumaier Fone Boole 1 Boole 2</p> <p>14:00 - 15:30</p>	
13:00			
13:30			
14:00	<p>Registration (Devere)</p> <p>(Badge/Programme pick up) 13:30- 15:30</p>	<p>15.30- 16:00 Coffee Break in Devere 30 min / change venue</p>	
14:30	<p>Welcome Talks (Devere) 15:30- 16:30</p>		
15:00		<p>Pioneers/prodigies; Travel Award session 1 16:00- 17:00 chair: Gaspar Devere</p>	
15:30	<p>Page Lecture (Devere) Patricia Gaspar 16:30-17:30</p>		
16:00	<p>Opening Reception in Aula Maxima 17:30- 20:00</p>	<p>Poster Session* Devere Hall</p> <p>Light Refreshments *posters will be accessible for viewing throughout conference 17:15-19:30</p>	
16:30			
17:00		<p>Dinner on own</p> <p><i>*Young Scientist Social evening: Serotonin Shindig</i></p> <p><i>*networking event (Irish style) for all young fellows on the first night. Guided pubcrawl among trainees/postdocs led by UCC Young Scientists.</i></p>	
17:30			
18:00			
18:30			
19:00			
19:30			
20:00			
20:30			
21:00			

Schedule of events

Tuesday July 17, 2018	Wednesday July 18, 2018
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Special Symposia A: gut/microbiome Cryan Boole 1</p> </div> <div style="width: 45%;"> <p>Special Symposia B: receptor heteromers Schellekens Boole 2</p> </div> </div> <p style="text-align: center;">08:00 - 09:15</p>	<p style="text-align: center;">Parallel Symposia 9 /10</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Rasenick/Nichols Boole 1</p> </div> <div style="width: 45%;"> <p>Soiza-Reilly/Garcia Boole 2</p> </div> </div> <p style="text-align: center;">8:00-9:30</p>
<p>09:15-09:45 Coffee Break in Devere 30 min</p>	<p>9.30-10-30 Coffee Break in Devere 30 min</p>
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Caron/Gershon Boole 1</p> </div> <div style="width: 45%;"> <p>Gonzalez-Maseo Boole 2</p> </div> </div> <p style="text-align: center;">09:45 - 11:00</p>	<p style="text-align: center;">Parallel Symposia 11/12</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>O'Mahony/Muma Boole 1</p> </div> <div style="width: 45%;"> <p>Alenina/Bader Boole 2</p> </div> </div> <p style="text-align: center;">10:00 - 11:30</p>
<p>11:00 – 11:15 Leg-stretching break 15 min</p>	<p>11.30- 11:45 Leg-stretching break 15 min</p>
<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Niesler/Barnes Boole 1</p> </div> <div style="width: 45%;"> <p>Heisler Boole 2</p> </div> </div> <p style="text-align: center;">11:15- 12:30</p>	<p style="text-align: center;">Parallel Symposia 13/14</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Commons Boole 1</p> </div> <div style="width: 45%;"> <p>Leopoldo Boole 2</p> </div> </div> <p style="text-align: center;">11:45- 13:15</p>
<p>12:30-14:00 Lunch in Devere 90 mins</p>	<p style="text-align: center;">Lunch in Devere 13:15-14:15</p>
<p style="text-align: center;">Parallel Symposia 7/8</p> <div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Sharp/Wong-Lin Boole 1</p> </div> <div style="width: 45%;"> <p>Haas/Blakely Boole 2</p> </div> </div> <p style="text-align: center;">14:00 - 15:30</p>	<p style="text-align: center;">Pioneers/prodigies; Travel Award session 3 chair: Cunningham Devere 14:15- 15:45</p>
<p>15.30- 16:00 Coffee Break in Devere 30 min / change venue</p>	<p>15:45-16:15 Coffee Break in Devere 30 min</p>
<p style="text-align: center;">Pioneers/prodigies; Travel Award session 2 chair: Geyer Devere</p>	<p style="text-align: center;">Rapport Lecture Devere Hall Mark A. Geyer 16:15-17:15</p>
<p>17:00-17:15 Leg stretching break 15 min</p>	<p>17:15 Walk to Pre-Dinner Reception in County Hall</p>
<p style="text-align: center;">Vanhoutte Lecture Kathryn A. Cunningham Devere</p>	<p style="text-align: center;">County Hall-Pre-Dinner Reception and Awards. Vertigo/Kingsley-Banquet Dinner <i>Please check ticket to identify which venue you are assigned</i> 18:00- 22:00</p>
<p style="text-align: center;">Own time</p> <p style="text-align: center;"><i>*Brewery tour & beer tasting@Fransican well from 19.30 Dinner on own (pizzas can be purchased in pub)</i></p>	

Honorary Irvine Page Plenary Lecture



Patricia Gaspar, MD, Ph.D.

*Research Director, École des Neurosciences de Paris
French Institute of Health and Medical Research
Inserm
Fer à Moulin Institute
Paris, France*

Dr. Patricia Gaspar is a Research Director (DR1), at Inserm in the "*Institut du Fer à Moulin*" a Neuroscience Center on brain development and plasticity. She is the current Director of Ecole de Neurosciences de Paris. Dr Gaspar was trained as an MD in Neurology at Paris Pitie Salpetriere and did her PhD at the University Pierre et Marie Curie in Paris on the anatomy of dopaminergic systems in the human brain in relation to Parkinson's disease. Her postdoctoral training was done at Vanderbilt University with Jon Kaas. Dr. Gaspar's work has focused on the developmental role of neurotransmitters and in particular the impact of early 5-HT dysfunction on neural circuit development in neuropsychiatric disorders. While some of the functional specificity of serotonin's actions are due to the wide diversity of 5-HT receptors, her group has shown that the source of cells that produce or release 5-HT is equally important. In the brain all 5-HT is produced in the raphe neurons of the brain stem. These neurons share common neurochemical identities, but can be distinguished by their developmental trajectories, anatomical, molecular and physiological properties. Using genetic approaches in mice, her research team was the first to demonstrate the role of 5-HT signaling on activity-dependent circuit maturation in the barrel cortex and in the visual system. Currently her lab is examining the role of guidance molecules on 5-HT pathway development, and on the mechanisms underlying the effects of early-life stress on brain wiring.

Patricia Gaspar is author of over 120 research papers and reviews, her work has been cited over 7500 times. She has received numerous awards for her research including the FENS EJM best publication award in 2015 and the BAP Guest lectureship in 2016. We are delighted to honor Dr. Gaspar as the 2018 Irvine Page Plenary Lecturer.

Honorary Maurice Rapport Plenary Lecture



Mark A. Geyer, Ph.D.

Distinguished Professor Emeritus of Psychiatry and Neurosciences
University of California, San Diego
La Jolla, California

Professor Mark Geyer is the former Vice Chair for Research in Psychiatry and currently directs the Neuropsychopharmacology Unit of the VISN 22 VA's Mental Illness Research, Clinical, and Education Center at UC San Diego. Mark obtained a B.A. Biology from University of Oregon Honors College, an M.A. Psychology from the University of Iowa before obtaining a Ph.D. in Psychology from the University of California at San Diego where he has remained throughout his prolific research career.

Professor Geyer's research has focused on the development of parallel behavioral paradigms in animals and humans for use in psychiatric drug discovery. He is a pioneer in the translational study of sensorimotor gating deficits in schizophrenia and related animal models and the development of a behavioural pattern monitor for rodents and man with cross-species translational relevance. He has published over 425 peer-reviewed papers, that have received over 51000 citations and he has a google scholar h index of 116. His research program has been supported continuously by grants from NIMH and NIDA for 30+ years. He was involved intensively in the NIMH-funded MATRICS, TURNS, and CNTRICS Programs. Mark is the lead Series Editor for Current Topics in Behavioral Neurosciences, which has completed 26 volumes. He is Associate Editor of Neuropsychopharmacology, member of scientific Council of NARSAD, Fellow and Council Member of the ACNP, Fellow of AAAS and American Psychological Society, Past-President and Fellow of International Behavioral Neuroscience Society, member of Scientific Council of NARSAD, Scientific Advisor to European Union's Innovative Medicine Initiative. His research has been recognized by many awards including the 2011 awardee of the Bleuler Prize for Research in the Schizophrenias and 2014 recipient of the ACNP Julius Axelrod Mentorship Award. Of course of greatest importance, Mark is a Past-President of the Serotonin Club! We are delighted to honor Professor Mark Geyer as the 2018 Maurice Rapport Plenary Lecturer.

Honorary Paul Vanhoutte Distinguished Lecture



Kathryn A. Cunningham, Ph.D.

Chauncey Leake Distinguished Professor of Pharmacology
Vice Chairman, Department of Pharmacology and Toxicology
Director, Center for Addiction Research
The University of Texas Medical Branch, Galveston, Texas

Professor Kathryn Cunningham is the Chauncey Leake Distinguished Professor of Pharmacology in the Department of Pharmacology at the University of Texas. Kathryn obtained a B.A. at the University of St. Thomas, Houston, a Ph.D. from the University of South Carolina, and a Certificate in Business Administration from the University of Houston/UTMB.

Kathryn's research has focused on improving our understanding of the neuropsychopharmacology of drugs of abuse with the aim of developing new medications for the treatment of psychostimulant abuse and neuropsychiatric conditions such as binge eating disorder, and obesity. Her most recent research focus has been pharmacological and anatomical studies pinpointing the critical roles of the 5-HT_{2A} and 5-HT_{2C} receptors in the behavioural response to drugs of abuse. Her research has incorporated a cross-disciplinary, and translational approach with medicinal and synthetic chemists, cell biologists, neuropharmacologists, and clinical scientists to discover novel serotonergic medications to extend abstinence. Professor Cunningham's research has been funded continuously by NIH for 26 years and has led to three patents for new chemical entities. She has over 120 publications that have been cited over 5300 times resulting in a h-index of 46. Her research achievements have been recognised by the American Society for Pharmacology and Experimental Therapeutics-Astellas Award for Translational Pharmacology, the Marian Fischman Memorial Award and the Mentorship Award from the College on Problems of Drug Dependence. Kathryn is currently Associate Editor of ACS Chemical Neuroscience and for Nature Neuropsychopharmacology. We are very pleased to honor Dr. Kathryn Cunningham as the 2018 Paul Vanhoutte Distinguished lecturer.



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The 19th Meeting of International Society for Serotonin Research
University College Cork

Programme Details

Sunday 15th July to Wednesday 18th July 2018

Sunday 15th July 2018

Registration

(Badge/Program pick up)

13:30- 15:30 Devere Hall

Welcome and Opening Remarks

John F. Cryan, Chair ISSR 2018
Kevin C. Fone, President ISSR 2018

15:30- 16:30 Devere Hall

16:30-17:30 Devere Hall



HONORARY IRVINE PAGE PLENARY LECTURE

A sentimental Journey through the serotonin Isles

Patricia Gaspar Ph.D

Inserm, Institut du Fer à Moulin,
Sorbonnes Universités, Paris,
France

Opening Reception

Aula Maxima

17:30- 20:00 Aula Maxima

20:00 Dinner on own

***Young Scientist Social evening: 'Serotonin shindig'**

**networking event (Irish style) for all young fellows on the first night. Guided pubcrawl among trainees/postdocs led by UCC young scientists.*

Monday 16th July 2018

Boole 1

08:00 - 09:30

Parallel Symposium 1: Delineating the Neural Circuits Underlying Serotonin Modulation of Fear and Anxiety

Chair: Anne Andrews University California, Los Angeles

Serotonin is known to be an important modulator of anxiety and serotonin dysfunction has long been implicated in anxiety disorders. However, there still remains much to be understood about the precise neural basis of serotonin's role in anxiety. The goal of this symposium is to highlight new insights into this role with presentations that utilize state of the art neuroscience approaches to interrogate the key neural circuits underlying serotonin's effects on fear and anxiety behaviors in mice.

08:00-08:25

Serotonin Signaling in the BNST Regulates Aversive Learning

Thomas Kash, University of North Carolina, Chapel Hill, USA

08:25-08:50

Ventral hippocampal serotonin signaling in anxiety and antidepressant mechanisms

Anne M. Andrews, University of California, Los Angeles, USA

08:50-09:15

Serotonin – Regulating Neuronal Powerplants

Vidita Vaidya, Medical Research Centre, Mumbai, India

09:15-09:30

Short oral presentation 1: The anxiolytic and antidepressant effects of fluoxetine are mediated by specific regions along the longitudinal axis of the hippocampus

Olivia O'Leary, University College Cork, Ireland

9.30-10-00

Coffee Break in Devere Hall

Boole 1

10:00 - 11:30

Parallel Symposium 3: Serotonin Transport Proteins in Ecstasy: SERTS and OCTS in a Frenzy

Chairs: Harald H. Sitte, Medical University, Vienna, and

Lynette C. Daws, University of Texas Health Science Center, San Antonio, USA

The serotonin (5-HT) transporter (SERT) is considered the main player regulating strength and duration of 5-HT signalling by its high-affinity, low-capacity clearance of 5-HT from extracellular fluid. SERT is a primary target of illicit drugs, including substituted amphetamines, such as 3,4-methylenedioxymethamphetamine (MDMA, "Ecstasy"), as well as newly emerged street drugs called "bath salts" or "research chemicals". Many of these drugs are substrates for SERT, as well as the dopamine (DA) transporter (DAT), increasing extracellular levels of these monoamines by competitively inhibiting their uptake, as well as promoting SERT- and DAT-dependent release of 5-HT and DA. However, it is becoming clear that the mechanisms by which these illicit drugs increase extracellular 5-HT and DA are far more complex, and may include actions at previously unsuspected targets. Our recent studies point to organic cation transporter 3 as one such target. OCT3 is a low-affinity, high-capacity transporter, capable of bidirectional flux of monoamines. This symposium will highlight the most recent, unpublished findings, in this rapidly developing field.

10:00-10:25

The molecular mechanisms of psychostimulant action at serotonin and organic cation transporters

Harald Sitte, Medical University Vienna, Austria

10:25-10:50

DATs not all it cracked up to be: Organic cation transporters in the actions of psychostimulants

Lynette Daws, University of Texas Health Science Center, San Antonio, Texas, USA

10:50-11:15

Activity at serotonin transporters modulates dopaminergic effects of newly-emerging stimulant drugs of abuse

Michael H. Baumann, National Institutes of Health, Baltimore, USA

11:15-11:30

Short oral presentation 3: Aptamer field-effect transistors to monitor serotonin in vivo

Nako Nakatsuka, University of California, Los Angeles, USA

11.30- 14:00

BLARNEY CASTLE TRIP (with packed lunch-collect from Devere) 2 hours 30 mins (15 mins by bus, exit near Devere Hall to embark on bus on Donovan's Road)

Monday 16th July 2018

Boole 2

8:00 - 09:30

Parallel Symposium 2: 5-HT_{1F} receptor agonists, the new kids on the block for antimigraine treatment

Chair: Antoinette Maassen van den Brink, Erasmus MC, Rotterdam

Ergot alkaloids and triptans (5-HT_{1B/1D/1F} receptor agonists) are well-established antimigraine drugs, but are ineffective in some patients. Moreover, because of their propensity to constrict the human coronary artery, their use is contraindicated in patients with coronary artery disease. Recently, selective 5-HT_{1F} receptor agonists have been developed based on the idea that 5-HT_{1F} receptor activation may be associated with the therapeutic benefit of triptans and ergot alkaloids, but devoid of vasoconstrictor potential. This symposium will provide an overview of the rationale for targeting 5-HT_{1F} receptors for migraine and present current preclinical obtained with experimental migraine models as well as clinical findings obtained with the selective 5-HT_{1F} agonist, lasmiditan.

08:00-08:25

Rationale behind the 5-HT_{1F} receptor as an antimigraine target

Carlos M. Villalón, Cinvestav-Coapa, Mexico City, Mexico

08:25-08:50

Preclinical pharmacological investigation of lasmiditan in experimental migraine models

Antoinette Maassen van den Brink, Erasmus MC, Rotterdam, The Netherlands

08:50-09:15

Clinical findings on the use of lasmiditan for the treatment of migraine

Kirk W. Johnson, Eli Lilly and Company, Indianapolis, U.S.A.

09:15-09:30

Short oral presentation 2: Genetically encoded photocross-linkers locate the heteromeric interface in a serotonin GPCR heteromer

Urjita H. Shah, Virginia Commonwealth University, Richmond, USA

09.30-10-00

Coffee Break in Devere Hall

Boole 2

10:00 - 11:30

Parallel Symposium 4: Lucky 7 (5-HT₇ Receptor): New Functions for a (relatively) New Colleague

Chairs: Stephanie W. Watts, Michigan State University, and Carlos M. Villalón, Cinvestav-Coapa, Mexico

The 5-HT₇ receptor was one of the most recently cloned (1993) of the 5-HT receptors. The 5-HT₇ receptor has relatively useful pharmacological tools that have allowed determination of function within the CNS and other sites. This symposium will focus on the more newly discovered 5-HT₇ receptor functions, both within and outside of the CNS. Finn Olav Levy will begin the symposium with an overview on 5-HT₇ receptor discovery, pharmacology and new tools used in current studies. Gregory D Fink will present data supporting the ability of 5-HT₇ through the 5-HT₇ receptor, to selectively dilate the venous circulation and lower blood pressure. Jasmina Profirovic will present data on the ability of the 5-HT₇ receptor to promote endothelial cell migration in health and disease. Urszula Sławińska will present data that describes the role of the 5-HT₇ receptor in locomotion and coordination.

10:00-10:18

The 5-HT₇ serotonin receptor is preassociated with the G protein Gs

Finn O'Levy, University of Oslo, Norway

10:19-10:37

The chronic depressor effect of circulating serotonin is mediated exclusively by the 5-HT₇ receptor

Gregory D. Fink, Michigan State University, Michigan, USA

10:38-11:56

Serotonin 5-HT₇ receptor in endothelial cells

Jasmina Profirovic, St. Louis College of Pharmacy, Missouri, USA

10:57-11:15

5-HT₇ receptor mediated control of locomotion

Urszula Sławińska, Polish Academy of Sciences, Warsaw, Poland

11:15-11:30

Short oral presentation 4: Sleep deprivation rapidly upregulates 5-HT_{2A} receptor expression in the prefrontal cortex via the immediate early gene *Egr3*

Amelia Gallitano, Arizona State University, Tempe, USA

11.30-14:00

BLARNEY CASTLE TRIP (with packed lunch-collect from Devere) 2 hours 30 mins (15 mins by bus, exit near Devere Hall to embark on bus on Donovan's Road)

Monday 16th July 2018

Boole 1
14:00 - 15:30
Parallel Symposium 5: Delving Deep into 5-HT Neurons: Probing Patterns and Regulation of 5-HT Transcriptomes and Translatome
Chairs: Evan Deneris, Case Western Reserve University, Cleveland, and John Neumaier, University of Washington

Precise spatiotemporal control of 5-HT neuron gene expression is crucial for proper serotonergic modulation of CNS circuitry. Altered 5-HT neuron gene expression, brought about by either genetic or environmental factors, has been implicated in neuropsychiatric disorders. In this symposium, the speakers will present deep sequencing studies of serotonergic transcriptomes and translatomes and how they are shaped by intrinsic regulatory factors and changing environmental conditions.

14:00-14:25 **Impact of stress on 5-HT neuron translatome**
John Neumaier, University of Washington, Seattle, USA

14:25-14:50 **Transcriptome-wide gene profiling approaches to identify molecular pH sensors in 5-HT neurons**
Matthew Hodges, Medical College of Wisconsin, USA

14:50-15:15 **Regulatory factors controlling 5-HT neuron maturation**
Evan Deneris, Case Western Reserve University, Cleveland, USA

15:15-15:30 **Short oral presentation 5: Orthosteric and Allosteric Activation Mechanisms of the Serotonin 5-HT_{2B} Receptor**
Bryan Roth, University of North Carolina Chapel Hill Medical School, USA

15.30- 16:00 **Coffee Break in Devere 30 min / Change venue**

Monday 16th July 2018

Boole 2
14:00 - 15:30
Parallel Symposium 6: Improving Our Understanding of Serotonin in the Neurobiology of Psychosis
Chairs: Kevin C. F. Fone, University of Nottingham and Maarten van den Buuse, La Trobe University, Melbourne

Neuropsychopharmacological literature has focussed on how dopaminergic, glutamatergic and GABAergic dysfunction in cortical and limbic regions contribute to the aetiology, pathophysiology and symptoms of schizophrenia. However, there is recent resurgent interest of the involvement of serotonin in psychopathology and actions of antipsychotics. Post-mortem changes in 5-HT receptors and transporters, neuroimaging and genetic association studies and evidence of 5-HT/glutamate crosstalk all support a role for 5-HT in psychosis and antipsychotic effects. This symposium focuses on recent behavioural, pharmacological, and neurodevelopmental findings linking the serotonergic system to symptoms and psychopathology of schizophrenia.

14:00-14:25 **Role of 5-HT_{1A} receptors in animal models of psychosis**
Maarten van den Buuse, La Trobe University, Melbourne, Australia

14:25-14:50 **Effect of serotonin receptors and hallucinogens on temporal discrimination in mice**
Adam L. Halberstadt, University of California, San Diego, USA

14:50-15:15 **Gestational poly I:C followed by post-weaning social isolation alters serotonin, cortical cytokines and cognitive function in rats and provides mechanistic insight into the neurodevelopment of psychosis.**
Kevin C. F. Fone, University of Nottingham, UK

15:15-15:30 **Short oral presentation 6: GABAergic, not serotonergic, alterations appear to underlie reduced efficacy of 5-HT₆ receptor antagonists in a dual-hit neurodevelopmental model for schizophrenia**
Madeleine King, University of Nottingham, UK

15.30- 16:00 **Coffee Break in Devere 30 min / Change venue**

Monday 16th July 2018

Devere Hall

16:00- 17:00

Pioneers/prodigies; Travel Award session 1

Chair: Patricia Gaspar



16:00- 16:15

Serotonergic Signaling in Astrocytes

Franziska E. Müller, Hannover Medical School, Hannover, Germany

16:15-16:30

5-HT neurons regulate fear learning by modulating the basal amygdala

Ayesha Sengupta, National Institute on Alcohol Abuse and Alcoholism, Rockville, USA.

University of Oxford, Oxford, UK

16:30-16:45

Intrinsic regulatory factors governing growth of serotonin neuron axonal architecture

Lauren J. Donovan, Case Western Reserve University, Cleveland, USA

16:45-17:00

Evaluating the role of 5-HT_{1B}R agonists on cocaine reinforcement and their potential as a treatment for psychostimulant use disorders.

Raul Garcia, Arizona State University, Tempe, U.S.A

17:00-17:15

Leg stretching break 15 min

17:15-19:30

Devere Hall

Poster Session*

Light Refreshments

**posters will be accessible for viewing throughout conference*

20:00

Dinner on own

Boole 1

Parallel Special Symposia A: Gut-Brain-Microbiome Axis

Sponsored by APC Microbiome Ireland



Serotonin was first discovered in the gut, and its conventional actions as an intercellular signaling molecule in the intrinsic and extrinsic enteric reflexes are well recognized. It is now also clear that bacteria within the lumen of the bowel influence serotonin synthesis and release by enterochromaffin cells. Also, serotonin can act both as a pro-inflammatory and anti-inflammatory signaling molecule in the intestinal mucosa. Thus, functional consequences of gut-brain signaling is being slowly unraveled.

Reciprocal interactions between the brain and gut, termed the “brain-gut axis”, have increasingly been found to play important roles in gastrointestinal (GI) and brain development and function. When GI or brain dysfunction occurs, brain-gut communications become abnormal and disease can result in either organ or in both. Symptoms of CNS dysfunction can be manifest as depression or anxiety. GI dysfunction can be reflected in any domain that depends on the enteric nervous system (ENS), including intestinal motility, intestinal epithelial growth, and/or permeability.

In the first symposium, chaired by Professor Cryan, exciting new data on the underlying mechanisms of the interactions between the microbiome, immune system and serotonin will be presented.

The second symposium, led by Professors Caron and Gershon, will provide a comprehensive overview of the brain-gut-microbiota axis and outline the role of serotonin in the brain-gut-microbiota axis in mental health. The last set of talks, chaired by Professors Niesler and Barnes, will further address the role of serotonin in the gastrointestinal tract, its implications in health and disease along with the potential for targeted intervention.

Boole 1 **I. Impact of Serotonin at the Microbial & Immune Interface on Gut-Brain Signalling**
08:00 - 09:15 *Chair: John Cryan, University College Cork, Ireland*

- 08:00-08:25 **Mucosal Serotonin Signaling in the Gut: Functions, dysfunctions and therapeutic targets**
Gary. M. Mawe, University of Vermont, Burlington, Vermont, USA
- 08:25-08:50 **A tale of two amines: microbial mediators of gastrointestinal motility and secretion**
Purna Kashyap, Mayo Clinic, Rochester, USA
- 08:50-09:15 **The gut microbiome, brain function and behaviour: Focus on microbial checkpoints for host serotonin and tryptophan metabolism**
Gerard Clarke, University College Cork, Ireland

09:15-09:45 **Coffee Break in Devere Hall**

Boole 1 **II. Serotonin as a Modulator of the Gut-Brain-Microbiome Axis in Depression and other Mental Health Disorders**
09:45 - 11:00 *Chairs: Marc Caron, Duke University School of Medicine, and Michael Gershon, Columbia University Medical Center, USA*

- 09:45-10:10 **The gut microbiome in pediatric autism spectrum disorder as a model for the interconnectivity of serotonin with changes in microbes, GI symptoms, and behavior**
Ruth Ann Luna, Baylor College of Medicine, Texas Children’s Hospital, USA
- 10:10-10:35 **Modulating the Role of Serotonin in Enteric Dysfunction**
Kara Gross- Margolis, Columbia University Medical Center, New York, USA
- 10:35-11:00 **5-HTP slow-release as a new therapeutic approach**
Marc G. Caron, Duke University Medical Center, Durham, USA

11:00 – 11:15 **Leg Stretching Break**

Boole 1 **III. Serotonin Revisited – New Insights in Disturbed Functions in the Gastrointestinal Tract**
11:15 12:30 *Chairs: Beate Niesler, University of Heidelberg, and Nicholas Barnes, University of Birmingham Medical School*

- 11:15-11:40 **Disturbances in the 5-HT system in Irritable Bowel Syndrome**
Beate Niesler, University of Heidelberg, Germany
- 11:40-12:05 **Serotonin initiates intestinal inflammation, defends enteric neurons from it, and contributes to the pathogenesis of gastrointestinal disorders**
Michael Gershon, Columbia University, New York, USA
- 12:05-12:30 **The Lead Candidate Drug CSTI-300; a novel 5-HT₃ receptor partial agonist with potential to treat patients with irritable bowel syndrome and carcinoid syndrome**
Nicholas Barnes, University of Birmingham, UK

12:30-14:00 **Lunch in Devere Hall**

Tuesday 17th July 2018

Boole 2

Parallel Special Symposia B: 5-HT Receptor Signaling and Heteromerization

The serotonin (5-HT) hypothesis of major depression has been at the center of understanding the neurochemical basis of mood disorder for some time. In addition, 5-HT has been shown to be crucial in reciprocal social interactions and social abnormalities seen across the majority of psychiatric disorders. The discovery of crosstalk of the 5-HT_{1A} receptor (5-HT_{1A}R), 5-HT_{2A}R and 5-HT_{2C}R in the brain, including hippocampus and midbrain raphe neurons opens up new strategies for treatment of depression and social disorders. The first symposium, chaired by Professors Schellekens and Fuxe, will highlight novel molecular mechanisms of 5-HT_{1A}R and 5-HT_{2A/C}R signaling and crosstalk that may represent new promising targets for antidepressant drugs in major depression and social behavior disorders. G protein-coupled receptors (GPCRs) are a remarkable multifaceted family of transmembrane proteins that exert a variety of physiological effects. Although family A GPCRs are able to operate as monomers, there is increasing evidence that homomerization and heteromerization affect fundamental aspects related to receptor function, trafficking and pharmacology. The second symposium, chaired by Professor Gonzalez-Maseo, will focus on 5-HT_{2C} receptor heteromerization and highlight work done in parallel between heterologous expression systems and whole animal models. Just like in real estate, location matters when understanding 5-HT_{2C} receptor function. In this last symposium, led by Professors Heisler and McElligott, the key subpopulations of 5-HT_{2C}Rs within the hypothalamus and brainstem influencing appetite, body weight and glucose homeostasis will be discussed. In addition, how the 5-HT_{2C}Rs are integrated within anxiety and fear circuits within the extended amygdala will be covered. Finally, the role of 5-HT_{2C}Rs in generalized and focal seizures will be discussed. The speakers will provide perspectives on the implications for targeting these 5-HT_{2C}Rs for the treatment of human disease/disorders and will propose future directions for basic and clinical research.

Boole 2

08:00 - 09:15

I. Novel Functional Crosstalk and Heterodimerization of Serotonin Receptors in Mood and Social Behaviour

Chairs: Harriët Schellekens, University College Cork and Kjell Fuxe, Karolinska Institutet

08:00-08:25

Novel crosstalk and heterodimerization of the 5-HT₂ receptor family with the oxytocin receptor and its potential for social behaviour

Harriët Schellekens, University College Cork, Cork, Ireland

08:25-08:50

FGFR1-5-HT_{1A} Heteroreceptor Complexes in the Raphe-Hippocampal serotonin System and their disturbances in a Genetic Rat Model of Depression

Kjell Fuxe, Karolinska Institutet, Stockholm, Sweden

08:50-09:15

Evidence for the existence of 5-HT_{1A}-5-HT_{2A} isoreceptor complexes in the brain with antagonistic allosteric receptor-receptor interactions

Dasiel O. Borroto-Escuela, Karolinska Institutet, Stockholm, Sweden

09:15-09:45

Coffee Break in Devere Hall

Boole 2

09:45 - 11:00

II. Serotonin Receptor Complexes as Key Players in CNS Function

Chairs: Javier Gonzalez-Maseo, Virginia Commonwealth University

09:45-10:10

Maturation and trafficking of inter-family GPCR complexes

Javier Gonzalez-Maseo, Virginia Commonwealth University, USA

10:10-10:35

Ligand-induced regulation of serotonin and dopamine receptor homomers

Graeme Milligan, University of Glasgow, Glasgow, UK

10:35-11:00

Biophysical Validation of Serotonin 5-HT_{2A} and 5-HT_{2C} Receptor Interaction

Noelle Anastasio, University of Texas, USA

11:00 – 11:15

Leg Stretching Break

Boole 2

11:15 12:30

III. Three Crucial Factors that Underpin 5-HT_{2C}R Function: Location, Location, Location. *Chairs: Lora Heisler, University of Aberdeen*

11:15-11:40

Specific subsets of 5-HT_{2C} receptors regulate appetite, body weight and glucose

Lora Heisler, University of Aberdeen, Aberdeen, UK.

11:40-12:05

Serotonergic modulation of aversive memory via 5-HT_{1A} receptor signaling in the BNST

Catherine A. Marcinkiewicz, University of North Carolina, Chapel Hill, USA.

12:05-12:30

Opposite Control by 5-HT_{2C} Receptors of Generalized and Focal Seizures

Giuseppe Di Giovanni, Malta University, Malta

12:30-14:00

Lunch in Devere Hall

Tuesday 17th July 2018

Boole 1
14:00 - 15:30

Parallel Symposium 7: Towards a Multiscale, Multispecies Perspective of Serotonergic Function
Chairs: Trevor Sharp, University of Oxford, and KongFatt Wong-Lin, University of Ulster

Serotonin can affect diverse brain functions and behavior, including emotion, cognitions and overall mental well-being. However, the complex structure and function of the serotonergic system present formidable challenges towards obtaining a full understanding of its mechanisms. With the advancement of more precise neurotechnology such as optogenetics and multiunit electrophysiological recordings in behaving animals, some of these mechanisms are beginning to be uncovered albeit revealing another layer of complexity, particularly the heterogeneous nature and multifunctional properties of the serotonergic system. Another valuable approach is computational modelling, which can provide a new quantitative and conceptual understanding of observed experimental data. This symposium will discuss the application of optogenetics and other techniques to elucidate the structure and function of serotonergic signalling across multiple scales in rodents and non-human primates. In addition, novel biologically-based computational modelling approaches to investigate serotonergic function will be discussed.

14:00-14:15 **Brainstem Dysfunction in Neuropsychiatric Disorders – AD/PD/Depression**
Harry Steinbusch, Maastricht University, The Netherlands

14:15-14:40 **Serotonergic neurons signal reward rate during dynamic decision making**
Jeremiah Cohen, Johns Hopkins University School of Medicine, Baltimore, USA

14:40-15:05 **Dual processing in the primate dorsal raphe neurons for decision making under different mood**
Kae Nakamura, Kansai Medical University, Osaka, Japan

15:05-15:30 **Multiscale computational modeling of serotonergic function**
KongFatt Wong-Lin, Ulster University, Derry/Londonderry, Northern Ireland, UK

15.30- 16:00 **Coffee Break in Devere Hall / Change venue**

Tuesday 17th July 2018

Boole 2
14:00 - 15:30

Parallel Symposium 8: Serotonin, Inflammation and Behaviour
Chairs: Jana Haase, University College Dublin, Dublin and Randy Blakely, Florida Atlantic University

Progress in recent years has placed the serotonergic system at the centre of behavioural consequences of acute and chronic immune system activation. Peripheral infection/inflammation enhances the expression of neuroinflammatory markers and triggers responses in various neurotransmitter systems. Serotonergic changes include enhanced serotonin release and serotonin transporter (SERT) activity, as well as 5HT receptor expression changes, which in turn are thought to be linked to anxiety and depression-like behaviour observed both in human patients as well as in animal models. The symposium will bring together current research using clinically relevant animal models of acute, chronic and maternal immune activation and highlights recent advances towards the elucidation of molecular mechanisms underlying inflammation induced behavioural effects over different time scales.

14:00-14:25 **Hot and Bothered: Inflammatory Cytokine Signaling, SERT and the Serotonergic Modulation of Behavior**
Randy Blakely, Florida Atlantic University, USA

14:25-14:50 **STAT3 controls IL6-dependent regulation of Serotonin Transporter function and depression-like behaviour**
Francisco J. Monje-Quiroga, Medical University of Vienna, Austria

14:50-15:15 **TNF α -dependent upregulation of hippocampal SERT activity and depression-like behaviour in a mouse model of collagen-induced arthritis**
Jana Haase, University College Dublin, Ireland

15:15-15:30 **Short oral presentation 7: *Garcinia mangostana* Linn displays antidepressant, antipsychotic and pro-cognitive effects in translational models of depression and schizophrenia: Role of serotonin and immune-inflammatory cascades**
Brian Harvey, North West University, Potchefstroom, South Africa

15.30- 16:00 **Coffee Break in Devere Hall / Change venue**

Tuesday 17th July 2018

Devere Hall

16:00-17:00

Pioneers/prodigies; Travel Award session II

Chair: Mark A. Geyer



16:00-16:15

Investigating organic cation transporter 3 (OCT3) and plasma membrane monoamine transporter (PMAT) as targets for development of new antidepressant treatments for juveniles and adolescents

Melodi A. Bowman, University of Texas Health Science Center, USA

16:15-16:30

Early life stress and antidepressant treatment impact the gut microbial and metabolic signatures during pregnancy and lactation in SERT^{+/-} rats

Anouschka S. Ramsteijn, University of Groningen, the Netherlands, University of Pennsylvania, USA

16:30-16:45

Title: A novel 5-HT₇ receptor antagonist, MC-RG19, decreases cue-induced reinstatement of cocaine seeking behavior.

B.A. Pagnia, Arizona State University, Tempe, USA

16:45-17:00

***In vivo* impact of the conformational regulatory SERT phosphorylation site Thr276**

Meagan A. Quinlan, Vanderbilt University, Florida Atlantic University, USA

17:00-17:15

Leg Stretching Break

HONORARY PAUL VANHOUTTE DISTINGUISHED LECTURE



Serotonin Matters in Addiction: Strategies for Pharmacotherapeutics

Kathryn A. Cunningham Ph.D

Center for Addiction Research, Department of Pharmacology and Toxicology,
University of Texas Medical Branch,
Galveston, Texas, U.S.A

17:15-18:15 Devere Hall

19.30 onwards

*Brewery tour & beer tasting at the Franciscan Well
Dinner on own (pizzas can be purchased in pub) *networking event (Irish style)

Wednesday 18th July 2018

Boole 1

8:00-9:30

Parallel Symposium 9: The Role of Serotonin in Synaptic Structure and Plasticity

Chairs: Mark Rasenick, University of Illinois, Chicago College of Medicine, and Charles Nichols, LSU Health Sciences Center, New Orleans

Several different subtypes of serotonin receptors are involved in multiple aspects of synaptic plasticity within the brain. In this symposium we will highlight the role of three 5-HT receptors in synaptic structure and plasticity. The first talk will discuss 5-HT₄ receptor signaling and cellular structure in neuroblasts and modulation of spine morphology in hippocampal neurons using FRET and time lapse-fluorescent microscopy. The second talk will focus on 5-HT₆ receptor interactions with G α , tubulin, and adenylyl cyclase in non-lipid raft domains. This activity leads to increase microtubule dynamics and neurite outgrowth. The third presentation will present data on 5-HT_{2A} receptor modulation of genes involved in synaptic plasticity in different neuronal populations and brain regions, and increases in dendritic spine density in mammalian mPFC and in *Drosophila melanogaster* glutamatergic CNS circuitry.

08:00-08:25

Dendritic spine plasticity depends on spatial dynamics of RhoA controlled by serotonin 5-HT₄ receptors

Evgeni Ponimaskin, University of Gottingen, Germany

08:25-08:50

G α -coupled GPCRs have a biphasic relationship with tubulin/microtubules to alter neurite outgrowth and constrain GPCR signaling: a universal mechanism for antidepressant action?

Mark Rasenick, VA Medical Centre, Chicago, USA

08:50-09:15

Functional consequences of 5-HT_{2A} receptor mediated synaptic plasticity: A single dose of psilocybin has long lasting and sustained antidepressant and anxiolytic effects in rats

Charles Nichols, LSU Health Sciences Center, New Orleans, LA, USA

09:15-09:30

Short oral presentation 8: Lack of brain serotonin affects feeding and differentiation of newborn cells in the adult hypothalamus

Friederike Klempin, Max Delbrück Centre for Molecular Medicine & Charité Medical University, Berlin, Germany

9.30-10.30

Coffee Break in Devere Hall

Boole 1

10:00 - 11:30

Parallel Symposium 11: Serotonin Regulation of Dendritic Spines

Chair: Siobhain O'Mahony, University College Cork

Symposium Proposer: Nancy Muma, University of Kansas <https://pharmtox.ku.edu/nancy-muma>

Dendritic spines are highly dynamic structures and this dynamic feature plays an important role in synaptic plasticity. Dendritic spine shape and size correlate to synaptic strength which is altered in an activity-dependent manner. Dendritic spine remodeling occurs with development, and learning and memory as well as in psychiatric and neurodegenerative diseases. This symposium will explore recent advances in our understanding of serotonin regulation of dendritic spines.

10:00-10:25

Synaptic and mitochondrial plasticity of rat hippocampus follows treatment with Vortioxetine

Jens Randel Nyengaard (Aarhus University Hospital, Denmark)

10:25-10:50

Synaptic remodeling depends on unusual signaling between serotonin receptors and the extracellular matrix

Monika Bijata, Nencki Institute of Experimental Biology of Polish Academy of Science Warsaw, Poland, Hannover Medical School, Hannover, Germany

10:50-11:15

Developmental and Functional Diversity of Serotonergic Fibers in the Post-Natal Mouse Brain

Massimo Pasqualetti, University of Pisa, Pisa, Italy

11:15-11:30

Short oral presentation 10: Sustained activation of postsynaptic 5-HT_{2A} receptors gates long-term depression in prefrontal cortex

Philippe Marin, INSERM, Montpellier, France

11.30- 11:45

Leg Stretching Break

Wednesday 18th July 2018

Boole 2

8:00-9:30

Parallel Symposium 10: Multilevel Assembly of Serotonin Circuits and Its Impact on Emotional and Motivated Behaviours

Chairs: Mariano Soiza-Reilly, Institut du Fer à Moulin and

Alvaro Garcia-Garcia, New York State Psychiatric Institute, Columbia University

Vulnerability to psychiatric disorders including anxiety and depression could have their origins during early developmental stages. There is growing evidence indicating that assembly and maturation of brain serotonin circuits could contribute to adult pathological states. This symposium seeks to expand our current understanding on how serotonin circuits and their different cellular and molecular components are established and precisely interconnected during postnatal life, and how these early-life events influence adult behavioral states. The three speakers proposed in this symposium are world-renowned scientist in the serotonin field that have pioneered both the development and use of an exquisite palette of molecular, genetic and functional tools to investigate at different levels the impact of serotonin circuit assembly and maturation on adult emotional and social behaviour in rodents.

08:00-08:25

Early-life serotonin and cortical interneuron subtype development

Alexandre Dayer, University of Geneva, Switzerland

08:25-08:50

Mapping cellular and molecular heterogeneity within the *Pet1+* dorsal and media raphe to selective behavioural and efferent outputs

Susan Dymecki, Harvard University, Boston, USA

08:50-09:15

Serotonin modulates maturation of afferent projections to the amygdala

Mark Ansorge, Columbia University, New York, USA

09:15-09:30

Short oral presentation 9: Sphingolipid control of serotonin balance in depression

Christian Muller, Friedrich-Alexander-University, Erlangen-Nürnberg, Germany

9.30-10-00

Coffee Break in Dever Hall

Boole 2

10:00 - 11:30

Parallel Symposium 12: Serotonin and mental illness: from brain development to adult dysfunction

Chairs: Natalia Alenina, Max Delbrück Center for Molecular Medicine, Berlin and

Michael Bader, Max Delbrück Center, Charité Medical University Berlin, Germany

Serotonin is a key neurotransmitter in mental illness as well as an important target for pharmacological intervention. Such a link is not only due to altered serotonergic function within the adult brain, but it may originate from the complex role of the 5-HT system during development. The present symposium will provide an up-to-date view of the role of serotonin in regulating specific circuits and mechanisms that may be relevant for the functional deterioration associated with mental illness.

10:00-10:25

Serotonin and development: the role of peripheral sources of serotonin in mammals

Natalia Alenina, Max-Delbrück Center for Molecular Medicine, Berlin, Germany

10:25-10:50

The effect of excessive serotonin during prefrontal cortex development

Sharon Kolk, Radboud University Nijmegen, the Netherlands

10:50-11:15

Influence of the serotonergic system on CDC42 signaling pathway

Francesca Calabrese, University of Milan, Italy

11:15-11:30

Short oral presentation 11: Increased maternal extracellular serotonin levels beneficially influences offspring's anxiety- and anhedonia-like behaviour

Sabrina Hanswijk, Radboud University Medical Centre, Nijmegen, the Netherlands

11.30- 11:45

Leg Stretching Break

Wednesday 18th July 2018

Boole 1 **Parallel Symposium 13: Feedback Control of Serotonin in Behaviour and Antidepressant Response**
11:45- 13:15 *Chair: Kathryn Commons, Children's Hospital, Harvard Medical School*

Feedback inhibition of serotonin (5-HT) neurotransmission is thought to play an important role in depression, anxiety and the response to SSRIs, yet the specifics have proven complicated. Recent studies using unique mouse models that control receptor expression in nuanced ways have shed new light on these mechanisms. Kathryn Commons will introduce systems theory of feedback control and open questions in the field, particularly in the context of SSRI effects. Paul Albert will discuss his recent work on the role of 5-HT_{1A} autoreceptors in resistance to SSRI treatment. Upon deletion of a key repressor of the 5-HT_{1A} gene, mice show increased 5-HT_{1A} autoreceptors with SSRI-resistant anxiety- and depression-like behavior that was reversed upon knockout of 5-HT_{1A} autoreceptors. David Leonardo will present work concerning the role 5-HT_{1A} heteroreceptors in the mPFC. These play a role via their control of the dorsal raphe nucleus (DRN) in adulthood in regulating mood-related behavior adolescence results in an adult depressive-like phenotype that might arise from impaired mPFC-DRN function. Using a recently developed transgenic mouse line that lacks 5-HT_{1B} autoreceptors, Katherine Nautiyal will discuss the role of the receptor for modulation of anxiety- and depressive-like behavior, as well as the response to SSRI treatment during adulthood, but not development. Taken together these studies being to reveal the importance of age and the location of particular receptors in regulating serotonin function.

- 11:45- 12:10 **The role of transcriptional deregulation of 5-HT_{1A} autoreceptors in adult behaviour and antidepressant response.** Paul R. Albert, Ph.D., Ottawa Hospital Research Institute, Ottawa Brain and Mind Research Institute, Ontario, Canada
- 12:10-12:35 **Serotonin signaling through Prefrontal Cortex 5-HT_{1A} receptors during adolescence can bi-directionally determine baseline Mood-related behaviours**
E. David Leonardo, Columbia University, New York, USA
- 12:35-13:00 **A lack of serotonin 1B autoreceptors results in decreased anxiety and depression-related behaviours**
Katherine Nautiyal, Columbia University & Dartmouth College, USA
- 13:00-13:15: **Short oral presentation 12: Effects of perinatal fluoxetine exposure on circadian rhythmicity, 5HT-1A receptor sensitivity and affective behaviour in female rats**
Danielle Houwing, University of Groningen, the Netherlands

13:15-14:15 **Lunch in Devere Hall**

Wednesday 18th July 2018

Boole 2 **Parallel Symposium 14: Serotonin and Autism Spectrum Disorder: Hyperserotonemia and Beyond**
11:45-13:15 *Chair: Marcello Leopoldo, University of Bari Aldo Moro, Bari, Italy*

Autism spectrum disorder (ASD) is a complex neurodevelopmental disorder characterized by core symptoms of impairments in communication and language, impairments in social interaction and social relatedness, and the presence of repetitive behaviours and restricted interests. More than fifty years ago, elevated whole blood 5-HT, or hyperserotonemia, was the first biomarker identified in ASD. Since then, a large number of studies have implicated the 5-HT system in the etiology of ASD. Further, the involvement of 5-HT in ASD is becoming even more apparent, as targeting different 5-HT receptor subtypes is showing promise to improve core symptoms of ASD, such as cognitive deficits and repetitive behaviours. The first talk will describe findings in a population of children with ASD and their parents, where higher maternal whole blood 5-HT levels were associated with less severe ASD symptoms and increased cognitive abilities in offspring. Talk #2 will address the role of 5-HT_{1A} receptor agonists on striatal glutamate release and repetitive behaviors in SHANK3 +/- mice, an animal model with a strong ASD phenotype. Talk #3 will illustrate the beneficial effects of 5-HT₇ receptor stimulation in mice models of Rett syndrome and Fragile X syndrome, the most common known single gene cause of ASD.

- 11:45- 12:10 **Maternal serotonin levels are associated with cognitive ability and core symptoms in autism spectrum disorder**
Jeremy Veenstra-Vandervele, Columbia University, NY Presbyterian Hospital, USA
- 12:10-12:35 **5-HT_{1A} Receptor Stimulation Modifies Repetitive Behaviours and Striatal Glutamate Efflux in SHANK3 +/- mice**
Michael A. Ragozzino, University of Illinois, Chicago, Canada
- 12:35-13:00 **LP-211 as a useful tool to study the effects of 5-HT₇ receptor activation in mouse models of Fragile X syndrome and Rett syndrome**
Marcello Leopoldo, Università degli Studi di Bari Aldo Moro, Bari, Italy
- 13:00-13:15: **Short oral presentation 13: Characterization of a specialized serotonergic neuron subtype responsive to dopamine and central to social behaviour**
Krissy Lyon, Harvard Medical School, Boston, USA

13:15-14:15 **Lunch in Devere Hall**

Wednesday 18th July 2018

Devere Hall
14:15- 15:45

Pioneers/prodigies; Travel Award session III
Chair: Kathryn A. Cunningham



- 14:15-14:30 **D-lysergic acid diethylamide (LSD) reverses depressive-like behaviour and serotonergic (5-HT) neurotransmission impairments in a murine model of chronic stress.**
Danilo De Gregorio, McGill University, Montreal, Canada
- 14:30-14:45 **Probing the contribution of plasma membrane monoamine transporter function to depressive behaviours and poor antidepressant efficacy**
T. Lee Gilman, University of Texas Health Science Center, San Antonio, USA
- 14:45-15:00 **Differential 5-HT_{1A} autoreceptor sensitivity to fluoxetine within raphe of a novel treatment-resistant depression/anxiety model**
Vahid-Ansari F, University of Ottawa Brain and Mind Research Institute, Canada
- 15:00-15:15 **Pre-neuronal serotonin: a new old function of ancient molecule**
Evgeny Ivashkin, Karolinska Institutet, Stockholm, Sweden, Russian Academy of Sciences, Moscow, Russia
- 15:15-15:30 **Time-Dependent Biased Signaling Kinetics of Psychedelics at the 5-HT_{2A} Receptor**
John McCorvy, University of North Carolina, Chapel Hill, USA
- 15:30-15:45 **Chiral selectivity towards the serotonin transporter is a hallmark of cathinones**
Felix P. Mayer, Medical University of Vienna, Austria

15:45-16:15 **Coffee Break in Devere Hall**

HONORARY MAURICE RAPPORT PLENARY LECTURE



Neuropsychedelia: from psychotomimetics to psychotherapeutics

Mark A. Geyer Ph.D

Departments of Psychiatry and Neurosciences,
University of California San Diego,
La Jolla, CA. USA

16:15-17:15 Devere Hall

17:15 **Short Walk to Pre-Dinner Reception in Cork County Hall**

18:00- 22:00

Cork County hall

Pre-Dinner Reception and Awards Ceremony

Vertigo
Restaurant/
Kingsley
Hotel

Vertigo Restaurant or Kingsley Hotel
Banquet Dinner

Please check ticket to identify which venue you are assigned

ISSR 2018 Poster Presentations, Devere Hall and Devere Balcony



ISSR 2018
Serotonin on the
Wild Atlantic Way



BRITISH
PHARMACOLOGICAL
SOCIETY



ACS Chemical
Neuroscience

Travel Award Recipients presentations	DEVERE HALL
Melodi A. Bowman Investigating organic cation transporter 3 (OCT3) and plasma membrane monoamine transporter (PMAT) as targets for development of new antidepressant treatments for juveniles and adolescents	A.1
Danilo De Gregorio D-lysergic acid diethylamide (LSD) reverses depressive-like behavior and serotonergic (5-HT) neurotransmission impairments in a murine model of chronic stress	A.2
Lauren J. Donovan Intrinsic regulatory factors governing growth of serotonin neuron axonal architecture	A.3
Raul Garcia Evaluating the role of 5-HT _{1B} R agonists on cocaine reinforcement and their potential as a treatment for psychostimulant use disorders.	A.4
T. Lee Gilman Probing the contribution of plasma membrane monoamine transporter function to depressive behaviors and poor antidepressant efficacy	B.1
Evgeny Ivashkin Pre-neuronal Serotonin:: A new old function of ancient molecule	B.2
Felix P. Mayer Chiral selectivity towards the serotonin transporter is a hallmark of cathinones	B.3
John McCorvy Time-Dependent Biased Signaling Kinetics of Psychedelics at the 5-HT _{2A} Receptor	B.4
Franziska E. Müller Serotonergic Signaling in Astrocytes	C.1
Broc A. Pagni A novel 5-HT ₇ receptor antagonist, MC-RG19, decreases cue-induced reinstatement of cocaine seeking behavior.	C.2
Meagan A. Quinlan <i>In vivo</i> impact of the conformational regulatory SERT phosphorylation site Thr276	C.3
Anouschka S. Ramsteijn Early life stress and antidepressant treatment impact the gut microbial and metabolic signatures during pregnancy and lactation in SERT ^{+/-} rats	C.4
Ayesha Sengupta 5-HT neurons regulate fear learning by modulating the basal amygdala	D.1
Farank Vahid-Ansari Differential 5-HT _{1A} autoreceptor sensitivity to fluoxetine within raphe of a novel treatment-resistant depression/anxiety model	D.2

Biochemistry Society Travel Award Recipient



BIOCHEMICAL
SOCIETY

Chandan K. Behera
Neural circuit modelling of serotonin-dopamine interactions in Ventral Tegmental Area and Dorsal Raphe Nucleus

D.3

Poster presentations Devere Hall	DEVERE HALL
Banerjee, Antara Delineation of signaling interactomes of hallucinogens and non-hallucinogens at the 5-HT_{2A} receptor	D.4
Bertero, A Mapping the serotonergic system wiring transmission	E.1
Bettikher, Ofelia The vascular reactivity to serotonin of human chorionic plate arteries in gestational diabetes and preeclampsia	E.2
Brivio, Paola Serotonin deficiency in the central nervous system alters neuroplastic mechanisms in basal condition and influences the response to an acute stress	E.3
<i>Chruścicka, Barbara</i> Serotonin 2C Receptor-mediated Attenuation of Oxytocin Receptor Signalling	E.4
Čičin-Šain, Lipa Endogenous serotonergic tone as a modulator of metabolic homeostasis and response to metabolic challenge	F.1
Clarke, Kyra M. OCT3, a putative mechanism contributing to the sedative/hypnotic effects of ethanol in mice	F.2
Compan, V. Common neural underpinnings between anorexia, memory and addiction	F.3
Cusotto, Sofia Psychotropic Drugs and Microbiota-Gut-Brain Axis Function	F.4
DeSanctis, Natalie A. The effects of gestational exposure to SSRI antidepressants on maternal and neonatal parameters in the rat	G.1
Ellenbroek, Bart A Genetic reductions of the serotonin transporter and the transgenerational effects of ethanol	G.2
Fitzpatrick, CM Characterization of 8-OH-DPAT-disrupted spontaneous alternation behaviour as a mouse model of compulsivity.	G.3
Fulling, Christine Differential Long-Lasting Behavioural and Molecular Effects of Perturbations of the Microbiome During the Adolescent Period in Mice	G.4
Gajewski-Kurziel, Paula A. Establishing the CNS Serotonergic Contribution to the Molecular, Physiological and Behavioral Actions of Inflammatory Cytokine IL-1β	H.1
Gallitano, Amelia Sleep deprivation rapidly upregulates 5-HT_{2A} receptor expression in the prefrontal cortex via the immediate early gene <i>Egr3</i>	H.2
Garcia-Garcia, Alvaro L. Contribution of raphe serotonin cells in encoding acute stress-related information to modulate behavioral states	H.3
Goldfarb, Yael Mono-allelic autoimmunity and serotonin	H.4
Golubeva, Anna V. Managing perinatal depression with fluoxetine: effect on maternal and neonatal microbiota	I.1
Golubeva, Anna V. Delayed colonic transit in obese mice is normalized by dietary prebiotic supplementation: implication of gut microbiota	I.2
Guseva, Daria Morphology and synaptogenesis of enteric neurons – the impact of serotonin receptor 5-HT₇	I.3

Poster presentations Devere Hall	DEVERE HALL
<p>Hanswijk, Sabrina I. Increased maternal extracellular serotonin levels beneficially influences offspring's anxiety- and anhedonia-like behaviour</p>	I.4
<p>Harvey, Brian H. <i>Garcinia mangostana</i> Linn displays antidepressant, antipsychotic and pro-cognitive effects in translational models of depression and schizophrenia: Role of serotonin and immune-inflammatory</p>	J.1
<p>Hatini, Paul G. Adaptations of the Serotonin System in a Model of Epilepsy</p>	J.2
<p>Houwing, Danielle Effects of perinatal fluoxetine exposure on circadian rhythmicity, 5HT-1A receptor sensitivity and affective behavior in female rats</p>	J.3
<p>Jaggar, Minal Serotonin_{2A} receptor knockout mice exhibit stress response, fluoxetine-induced anxiety and corticosterone levels, and perturbed gene expression in a sexually dimorphic manner.</p>	J.4
<p>Joshi, Alok A large-scale computational modelling study to investigate serotonergic modulation of cortical columnar dynamics</p>	K.1
<p>Kalinina, Tatiana S. The level of maternal serotonin during pre-implantation pregnancy is crucial for the formation of an anxious and depressive-like behavior in the offspring</p>	K.2
<p>Kanen, Jonathan W. Tryptophan depletion potentiates moral emotions to scenarios of social harm</p>	K.3
<p>King, Madeleine GABAergic, not serotonergic, alterations appear to underlie reduced efficacy of 5-HT₆ receptor antagonists in a dual-hit neurodevelopmental model for schizophrenia</p>	K.4
<p>Klempin, Friederike Lack of brain serotonin affects feeding and differentiation of newborn cells in the adult hypothalamus</p>	K.5
<p>Kocsis, Bernat Differential effects of the stimulation of median raphe nucleus on the power and frequency of hippocampal theta oscillations</p>	K.6
<p>Lehigh, Kathryn Serotonergic <i>Pet1-Tac1</i> neurons project to spinal cord motor areas and modulate respiration</p>	K.7
<p>Levitan, Robert Seasonal Effects on Serotonin Markers During Pregnancy</p>	K.8
<p>Lyon, Krissy Characterization of a specialized serotonergic neuron subtype responsive to dopamine and central to social behavior</p>	K.9
<p>Lyte, Joshua M. The microbiota defines the gastrointestinal serotonergic response to acute stress in a sex- and region-dependent manner</p>	K.10

Poster Presentations Devere Balcony	DEVERE BALCONY
Maier, Julian The psychostimulant (\pm)-cis-4,4'-dimethylaminorex (4,4'-DMAR) interacts with human SLC6A4 and other plasmalemmal and vesicular monoamine transporters in a manner similar to MDMA	L.1
Marin, Philippe Sustained activation of postsynaptic 5-HT_{2A} receptors gates long-term depression in prefrontal cortex	L.2
Müller, Christian P. Sphingolipid control of serotonin balance in depression	L.3
Murnane, Kevin S. Serotonin 2A receptors as a target for alcohol-use disorder	L.4
Nakatsuka, Nako Aptamer field-effect transistors to monitor serotonin <i>in vivo</i>	M.1
Neumann, J Evidence for 5-HT₄ signal transduction via phosphodiesterases (PDEs) in transgenic mice	M.2
Odagaki, Yuji Altered 5-HT_{2A} receptor-mediated G_{βγ} signalling in postmortem prefrontal cortical membranes in opiate addicts	M.3
Okaty, Benjamin W. Transcriptome profiling of postmortem human infant serotonin neurons and brainstem raphe nuclei – towards a molecular understanding of sudden infant death syndrome.	M.4
O'Leary, Olivia F. The anxiolytic and antidepressant effects of fluoxetine are mediated by specific regions along the longitudinal axis of the hippocampus	N.1
Olivier, Jocelien Alcohol intake in maternally stressed serotonin transporter knockout rats	N.2
Olusakin, J Development of the prefrontal to raphe circuit. Role of Serotonin	N.3
O'Sullivan, Ruairi High-density recording of DRN neurons in-vivo	N.4
Peeva, Polina Mineva Early life growth retardation and increased fat metabolism in <i>Tph2</i>-deficient rats	O.1
Petermann, Markus Novel insights into antidepressant action reveal the interplay of serotonin, stress axis, neurogenesis and BDNF signaling	O.2
Pinacho, Raquel Chemogenetic activation of serotonin neurons in the dorsal raphe	O.3
Roberts, Alexander Further studies investigating the pharmacology of CSTI-300; a novel 5-HT₃ receptor partial agonist with potential to treat patients with irritable bowel syndrome and carcinoid syndrome	O.4
Roth, Bryan L. Orthosteric and Allosteric Activation Mechanisms of the Serotonin 5-HT_{2B} Receptor	P.1
Sampson, Maureen Serotonin Modulates a Novel Microcircuit in the <i>Drosophila</i> Visual System	P.2
Schweickert, Axel Human Serotonin type 3 receptor subunit D (5-HT _{3D}): A novel negative regulator of Wnt signaling.	P.3
Schweimer, Judith V. Large scale monitoring of neural activity in dorsal raphe nucleus of freely moving mice	P.4
Scotto-Lomassese, Sophie Role of 5-HT in maternal behaviour	P.5

Poster Presentations Devere Balcony	DEVERE BALCONY
Shah, Urjita H. Genetically encoded photocross-linkers locate the heteromeric interface in a serotonin GPCR heteromer	P.6
Sławińska, Urszula Advantages and disadvantages of DREADD technology in serotonin related investigations	P.7
So, Cheryl 5-HT modulation of cortical parvalbumin-positive interneurons	P.8
Soiza-Reilly, Mariano SSRIs target prefrontal-raphe circuits during development to modulate synaptic connectivity and emotional behavior	P.9
Spampinato, Umberto Serotonin_{2B} receptors exert a GABA-mediated inhibitory control on dorsal raphe nucleus serotonin neuron activity: a microdialysis study in the rat	P.10
Spencer, W. Clay The open chromatin landscape of 5-HT neurons	P.11
Vaidya, Vidita A. Serotonin – a regulator of neuronal mitochondrial energetics and biogenesis	P.12
van de Wouw, Marcel Modulation of host serotonin and the microbiota-gut-brain axis by the fermented milk drink, kefir	P.13
Voronezhskaya, Elena E. Non-canonical function of early serotonergic neurons in molluscan and annelid larvae: from neurite growth navigation to link between generations	P.14
Wallace-Fitzsimons, , Shauna E. Novel Crosstalk and Heterodimerization of the Oxytocin Receptor and Serotonin 2A Receptor	P.15
Zajdel, Paweł PZKKN-94 – a novel and potent dually acting 5-HT₆R antagonist/5-HT_{1B}R agonist with pro-cognitive, antidepressant and antiparkinsonian properties in animal models	P.16
Zajdel, Paweł A novel potent, selective and metabolically stable 5-HT₇ receptor inverse agonist PZ-1373 with antidepressant and anxiolytic properties	P.17
Zaniewska, Magdalena The ability of serotonin (5-HT)_{2C} receptor agonist to alleviate affective signs of nicotine withdrawal	P.18

Serotonin and the Irish

(adapted from speech given by John Cryan at ISSR mixer in 2012)

Being Irish is very much like serotonin.

- Relatively speaking serotonin makes up only a small number of the brain's neurons. Ireland is a small nation (5 million people) but the Irish sure make a lot of noise.
- Like being Irish, serotonin is in your blood.
- The rostral raphe nucleus, the "home" of serotonin is a small area divided in two segments, i.e., dorsal and median raphe, that can have differing effects. Ireland is a tiny island at the edge of Europe which is divided in two, both sides which have been known to fight with each other....
- Raphe serotonin can have a vexed relationship with its neighbors...less said about Ireland's neighbors the better.
- We all know that there is a large family of 5-HT receptors... and the Irish are known for their fecundity....In all families, especially Irish families there is always a black sheep:- 5-HT₃ anyone!
- If you deplete 5-HT by dietary means it can recover but it can have long lasting effects. In Ireland we had the potato famine that still leaves a mark on our social history.
- Serotonin's actions are often far away from its home. Being Irish means that emigration is part of our heritage, even if we've never wandered far from the family farm.
- Serotonin has got a lot of bad press recently, i.e., suicide, pharmaceutical conflicts, withdrawals – Irish, we've had the IMF in, banking crises, property crash, clerical sex abuse scandals.
- Serotonin is basically involved in everything; Irish are everywhere.....
- Serotonin is involved in mood; being Irish makes you happy; everyone wants to have more serotonin; everyone wants to be Irish...On the flip side no one does misery better than the Irish "Worse than the ordinary miserable childhood is the miserable Irish childhood, and worse yet is the miserable Irish Catholic childhood," wrote Frank McCourt, in his memoir, "Angela's Ashes". "This is one race of people for whom psychoanalysis is of no use whatsoever." - Sigmund Freud said about the Irish.
- Serotonin is involved in learning and memory; Irish never forget and the English never remember
- Serotonin is stubborn- very different to other monoamines and indeed it was Churchill who said "We have always found the Irish a bit odd. They refuse to be English."
- Gastrointestinal function: Approximately 90% of the human body's total serotonin is located in the enterochromaffin cells in the gut, where it is used to regulate intestinal movements. The majority of people who identify themselves as Irish live outside of Ireland. Serotonin is involved in motility and defecation and it has often been said that the Irish are full of s@*t.
- Serotonin is long known to modulate food intake –Irish have wonderful food ingredients but don't necessarily always use them optimally...
- Regarding Sex- Serotonin can have an inhibitory effect. It has been said "there was no sex in Ireland before television".
- Then there is alcohol: 5-HT is key to alcohol's action "I am a drinker with a writing problem" said the famous Irish writer Brendan Behan whereas a former soccer superstar George Best is reported to have said "I spent 90% of my money on women and drink. The rest I wasted."
- Serotonin has given us superstars –Prozac, LSD, buspirone, the triptans, ondansetron, MDMA, clozapine: The Irish have Yeats, Joyce, Beckett, Heaney, Bono & U2, Shaw, Wilde, Michael Fassbender, Saoirse Ronan, Liam Neeson and Rory McIlroy.
- Finally, if the corollary of my argument is to be taken then one can take something that the Irish are masters at and implicate a role for 5-HT in it. Thus I give you the hypothesis that serotonin is involved in being good at golf.
- Our President Michael D. Higgins has said he loves Ireland 'for its imagination and its celebration of the endless possibilities for our people'. Here we welcome wonderful friends, colleagues and serotoninologists to Cork, people who love 5-HT and all its complexities, love it for its imagination and celebrate its endless possibilities.....

Social Events

Sunday 15th July. “Serotonin Shindig” Young Scientists Social Evening

An organised pub tour along some of the local typical Irish pubs. A great networking opportunity for all and young scientists in particular. Groups of scientists will be accompanied by the local Cork Team along the indicated pubs. The final destination will be the crane lane. See MAP

Tuesday 17th July. “Luck of the Irish”, beer tasting and brewery.

On the evening of Tuesday 17th from 7pm we will have a tour and beer tasting at Cork’s Franciscan Well Brewery and Brew Pub. This is one of Ireland’s longest established and best respected craft breweries. The “Well” has gained national fame for its popular beers along with international recognition for its numerous craft beer awards from across Europe along with their successful collaboration with Jameson Whiskey. Founded by Shane Long in 1998, it is now Ireland’s No.1 Craft Brewery*. The brewery was founded on the North Mall in Cork City and is built on the site of an old Franciscan monastery and well dating back to the year 1219. Legend has it that water from the well had miraculous and curative properties, and people would come from afar to drink from it. When you first walk through the modest entrance of the Franciscan Well Brewery and Brew Pub you are struck by the passion of its brewers. This love for the well and its beer is infectious and emanates from all the staff. The tour runs for approximately 1.5 hours and entails 45 minutes in the brewery where the brewing process and equipment are outlined and around 45 minutes upstairs in our tasting room where you are given a tasting tutorial and samples of beer to taste. This costs €10 per person.

It is of course also possible to come a sip a tasty beer without the tour also. At the back there is a covered beer garden which also houses a fabulous pizza oven-it is possible to order pizzas for €10.

<http://www.franciscanwellbrewery.com/en/index>

Wednesday 18th “Cork Uncorked” Closing Banquet

On the final night Wednesday, the 18th July we will celebrate our new serotonin friends and the “heights” of our Irish adventure during the closing banquet “Serotonin Uncorked”. The closing Gala Banquet will be held in dual venues 'The Kingsley Hotel' and 'Vertigo' at Cork County Hall which is across the road from the Kingsley. Festivities kick off at 6pm with a reception for all, in the County Hall ground floor.

Serotonin Shindig- Young Scientists Social Evening



(1) The oval



(2) An spailpin fanach



(3) The Bodega



(4) Rising sons brewery



(5) The Vicarstown Bar



(6) Deep South



(8) Crane lane



(7) Mutton lane inn

Map showing UCC in relation Cork County Hall and Kingsley and River Lee Hotels and refer to detail map for UCC locations



Detail Map of UCC
showing conference locations



