

CCNP NEWSLETTER
MARCH 2020
(<http://www.ccnp.ca>)

43RD ANNUAL MEETING: TORONTO, ONTARIO

Given the widespread travel restrictions and the need to practice healthy personal distancing that have been imposed because of the COVID-19 pandemic, the CCNP Executive and Local Organizing Committee (LOC) of this year's Annual Meeting have made the very difficult decision of postponing the upcoming meeting originally scheduled for June 10-13, 2020 at the Chestnut Conference Centre in Toronto.

The meeting will be postponed until the summer of 2021 and will be held in Toronto, under the direction of the current LOC. Information on the exact dates and venue will be circulated once confirmed.

The LOC will be seeking advice on how to manage the symposia submitted for this year's originally intended meeting. Information about the distribution of this year's CCNP Major Awards will be made available shortly.

We want to thank the entire CCNP community for your patience as we navigate through this very challenging situation.

We wish you, your loved ones and your esteemed colleagues safety and good health.

Regards,

Francesco Leri, Ph.D. | Professor
Associate Dean, Research and Graduate Studies
College of Social and Applied Human Sciences | University of Guelph
MacDonald Institute 105 | 50 Stone Rd E | Guelph, ON | N1G 2W1
[519-824-4120](tel:519-824-4120); [58264](tel:58264) | fleri@uoguelph.ca

CCNP 2020 MAJOR AWARDS RECIPIENTS:

Heinz Lehmann Award	-	Dr. Martin Alda
Innovations in Neuropsychopharmacology	-	Dr. Jeffrey Meyer
Young Investigator Award	-	Dr. Caroline Menard
CCNP Medal	-	Dr. Beverley Orser

Please see attached the bios as well as next year's awards notices.

Congratulations to the above individuals and thank you to everyone who took the time to apply for the awards!

CCNP 2020 ELECTION:

An election was held in the New Year. The following individuals were elected and will commence their two-year position June 15, 2020:

President	-	Dr. Jeff Daskalakis (Toronto)
Vice-President	-	Dr. Cecilia Flores (Montreal)
Past-President	-	Dr. Francesco Leri (Guelph)
Treasurer	-	Dr. Tak-Pan Wong (Montreal)
Secretary	-	Dr. Darrell Mousseau (Saskatoon)
Councillors (3 Basic)	-	Dr. Paul Clarke (Montreal) Dr. Jennifer Murray (Guelph) Dr. Natalina Salmaso (Ottawa)
Councillors (3 Clinical)	-	Dr. Danielle Baribeau (Toronto) Dr. Ishrat Husain (Toronto) Dr. Weihong Song (Vancouver)
Junior Councillors (2)	-	Stephen Daniels (Toronto) Victoria Marshe (Toronto)
Awards Committee Basic (1)	-	Dr. Nadia Chaudhri (Montreal)
Awards Committee Clinical (1)	-	Dr. Sherif Karama (Montreal)

Congratulations to all the above!



CCNP MEMBERSHIP

We encourage each member of the CCNP to invite at least one other person in the field of neuropsychopharmacology to join our ranks. Please fill in your name as the sponsor and invite a colleague that you feel will be a valuable addition to the CCNP to submit an application for membership. This is very important since a larger membership will ensure a broader representation of neuropsychopharmacology research. Therefore, please consider asking all of your colleagues who are interested in research to consider joining. Those wishing to apply for CCNP membership can do so on-line at the CCNP website (<http://www.ccnp.ca>).

Membership dues are **\$150 per year for Fellows** and **\$25 per year for both Junior Members and Retired Fellows**. Subscription to the *Journal of Psychiatry and Neuroscience*, the CCNP's official journal, is offered to the CCNP membership free of charge.

PROVISIONAL NEW CCNP MEMBERS FOR 2019-2020

FELLOWS:

AGUILAR VALLES, Argel, PhD

Assistant Professor
Department of Neuroscience
Carleton University
1125 Colonel By Drive
Ottawa, ON K1S 5B6
Tel.: (613) 520-2600 Ext. 7044
Email: argel.aguilavalles@carleton.ca or
argel.aguilar@gmail.com
Sponsor: Dr. C. Flores

BARIBEAU, Danielle, MD, FRCPC

Child Psychiatry Fellow, PhD Student
123 Edward Street, Unit 1210
Toronto, ON M5G 0A8
Tel.: (416) 813-1500
Email: danielle.baribeau@sickkids.ca
Sponsor: Dr. B. Goldstein

HUSAIN, Ishrat, MBBS, MD (Res.),

MRCPsych
Clinician Scientist; Staff Psychiatrist
General Adult Psychiatry & Health Systems
Centre for Addiction and Mental Health
100 Stokes Street
Toronto, ON M6J 1H4
Tel.: (416) 899-3951
Email: ishrat.husain@camh.ca
Sponsor: Dr. Z. Daskalakis

SALMASO, Natalina, PhD, CPO

Associate Professor, CRC
Carleton University
1125 Colonel By Drive
HSB 5312
Ottawa, ON K1S 5B6
Tel: (613) 520-2600
Email: natalina.salmaso@carleton.ca or
nsalmaso@gmail.com
Sponsor: Dr. P. Albert

JUNIOR MEMBERS:

AHMED, Mashal, BSc.

Graduate Student
Centre for Addiction and Mental Health
250 College Street
Toronto, ON M5T 1R8
Email: mashal.ahmed@camh.ca or
mashal.ahmed@mail.utoronto.ca
Sponsor: Dr. I. Boileau

BUCKHALTER, Shoshana, BSCH

MSc. Candidate
Department of Molecular & Cellular Biology
University of Guelph
23 Moore Ave.
Guelph, ON N1G 1R5
Tel.: (416) 841-3618
Email: sbuckhal@uoguelph.ca or
buckhalter.shoshana@gmail.com
Sponsor: Dr. M. Perreault

DANIELS, Stephen, MSc.

PhD Student
Department of Psychology
University of Guelph
Apt. 5, 4 Howick Place
Ottawa, ON K1S 3S5
Tel.: (519) 897-9071
Email: daniels@uoguelph.ca
Sponsor: Dr. F. Leri

MANDUCA, Josh, BSc.

MSc. Candidate
Department of Molecular & Cellular Biology
University of Guelph
15 Valeriotte Pl.
Guelph, ON N1G 3X1
Tel.: (807) 357-5649
Email: jmanduca@uoguelph.ca
Sponsor: Dr. M. Perreault

NEUFELD, Nicholas, MD, MSc, FRCPC
Psychiatrist
CIHR Research Fellow
250 College Street
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Email: nick.neufeld@utoronto.ca or
Nicholas.neufeld@camh.ca
Sponsor: Dr. B. Goldstein

WATLING, Sarah, MSc.
PhD Student
Institute of Medical Science
University of Toronto
39 Jerman St.
Markham, ON L3P 2S4
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Email: sarah.watling@camh.ca or
sarah.watling@mail.utoronto.ca
Sponsor: Dr. I. Boileau

CCNP Newsletter compiled by:
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CANADIAN COLLEGE OF NEUROPSYCHOPHARMACOLOGY
COLLÈGE CANADIEN DE NEUROPSYCHOPHARMACOLOGIE

CCNP Medal

This Award was established to honour individuals for a meritorious career in, and outstanding contribution to, neuropsychopharmacology in Canada as evidenced by their activities in education, administration and/or patient care. Achievement in research is not a necessary criterion for this Award. An outstanding contribution implies achievement at the national or international level, and evidence of novel initiatives.

The Award, which does not have to be awarded each year, consists of a bronze medal engraved with the name of the recipient.

Nomination for 2021 CCNP Medal

The names of nominees should be received by Dr. Jeff Daskalakis by **November 30th, 2020**. Supporting documentation must be received by **December 31st, 2020**. For each award, this documentation shall consist of:

1. A completed CCNP Medal checklist, signed by the nominee.
2. A two-page summary prepared by the sponsor describing the nominee's work and its importance in furthering the field of neuropsychopharmacology.
3. The nominee's curriculum vitae.
4. Up to 5 manuscripts or reprints considered by the sponsor to be pertinent to the nomination and which highlight the nominee's work.
5. A brief biographical sketch of the candidate prepared by the sponsor.

Formal presentation of the Award will be made to the recipient during the Annual Meeting of the College.

Please send the name of the nominee and a short supporting letter to:

Dr. Jeff Daskalakis
President - CCNP

*** Please send one copy of the above electronically to Dr. Daskalakis at jeff_daskalakis@camh.net and one copy electronically to the CCNP Secretariat at rmena@ualberta.ca.

Deadline for receipt of initial nomination and short supporting letter is November 30, 2020.



CANADIAN COLLEGE OF NEUROPSYCHOPHARMACOLOGY
COLLÈGE CANADIEN DE NEUROPSYCHOPHARMACOLOGIE

CCNP Medal

Sponsored by the Canadian College of Neuropsychopharmacology

Checklist

_____ Two-page summary of my work and its importance to neuropsychopharmacology.

_____ Manuscripts and reprints pertinent to the nomination (maximum = 5)

_____ My CV

_____ Brief biographical sketch

_____ I agree to be nominated for the 2021 CCNP Medal.

_____ I attest to the accuracy of the information supplied in my application.

Signature

Date

Previous CCNP Medal Recipients

1988	Y.-D. Lapierre
1990	T. L. Sourkes
1991	N. P. V. Nair
1992	R.T. Coutts, J.M. Cleghorn
1993	W. G. Dewhurst
1994	P. D. Hrdina
1995	D. J. McClure
1996	A. Villeneuve
1997	G. Baker
1998	No award given
1999	No award given
2000	A.G. Awad
2001	No award given
2002	T. Reader
2003	S.N. Young
2004	D. Addington
2005	No award given
2006	S. Kennedy
2007	R. Quirion
2008	S. Kutcher
2009	L. Yatham
2010	No award given
2011	M. Steiner
2012	A. Phillips
2013	L.T. Young
2014	No award given
2015	A. Malla
2016	No award given
2017	Z. Merali
2018	P. Boksa
2019	L. Srivastava
2020	B. Orser



CANADIAN COLLEGE OF NEUROPSYCHOPHARMACOLOGY
COLLÈGE CANADIEN DE NEUROPSYCHOPHARMACOLOGIE

Heinz Lehmann Award

For Outstanding Contributions to Neuropsychopharmacology
Sponsored by Pfizer Canada Inc.

The Heinz Lehmann Award is designed to recognize the outstanding contributions and distinguished career by a single individual in the field of research in neuropsychopharmacology in Canada. The Award consists of \$2,000 honorarium and a suitably engraved plaque. The Heinz Lehmann Award shall be presented annually for work done primarily in Canada by Canadian scientists. Exceptionally, if there is no qualified nominee in the view of the Awards Committee, the award will not be given.

Eligibility shall include individuals from academic institutions, foundations, governmental, industrial and research organizations, regardless of age or sex. The decision of the Awards Committee shall be based on originality and uniqueness of approach to clinical or laboratory research that had led to new, significant neuropsychopharmacological knowledge or concepts, or to the development of new therapeutic agents for the treatment of mental diseases. This should be evidenced by contributions based either on a specific piece of research or on a large body of neuropsychopharmacological research done over a period of years. In assessing individual publications, the committee will consider citation history, but not to the exclusion of other information. For works by multiple authors, the particular contribution of the award nominee must be clearly specified. The Awardee is expected to give a lecture based on his/her research at the Annual Meeting of the CCNP, and to contribute a manuscript based on the lecture to the CCNP official journal, the Journal of Psychiatry & Neuroscience, no later than six months after the lecture.

Nomination for 2021 Heinz Lehmann Award

The names of nominees should be received by Dr. Jeff Daskalakis by **November 30th, 2020**. Supporting documentation must be received by **December 31st, 2020**. For each award, this documentation shall consist of:

1. A completed Heinz Lehmann Award checklist signed by the nominee.
2. A two-page summary prepared by the sponsor describing the nominee's contributions, distinguishing career accomplishments, and importance of the nominee's work in furthering the field of neuropsychopharmacology.
3. Up to 5 manuscripts or reprints considered by the sponsor to be pertinent to the nomination and which highlight the nominee's work.
4. The nominee's curriculum vitae.
5. A brief biographical sketch of the candidate prepared by the sponsor.

Formal presentation of the Award will be made to the recipient during the Annual Meeting of the College.

Note: The Heinz Lehmann Research Award may be given for basic research or clinical research in alternate years. The 2021 Award will be presented for basic research.

Please send the name of the nominee and a short supporting letter to:

Dr. Jeff Daskalakis
CCNP President

*** Please send one copy of the above electronically to Dr. Daskalakis at jeff_daskalakis@camh.net and one copy to the CCNP Secretariat at rmena@ualberta.ca.
Deadline for receipt of initial nomination and short supporting letter is November 30, 2020.



CANADIAN COLLEGE OF NEUROPSYCHOPHARMACOLOGY
COLLÈGE CANADIEN DE NEUROPSYCHOPHARMACOLOGIE

Heinz Lehmann Award
For Outstanding Contributions to Neuropsychopharmacology
Sponsored by Pfizer Canada Inc.

Checklist:

- _____ Two-page summary of my work and its importance to neuropsychopharmacology.
- _____ Manuscripts and reprints pertinent to the nomination (maximum = 5)
- _____ My CV
- _____ Brief biographical sketch
- _____ I agree to be nominated for the 2021 Heinz Lehman Award.
- _____ If I am the award recipient, I will give a lecture at the 2021 CCNP annual meeting.
- _____ If I am the award recipient, I will contribute a manuscript to the CCNP journal, the *Journal of Psychiatry & Neuroscience*, within 6 months after the 2021 CCNP meeting.
- _____ 250-word abstract for a paper that could be submitted to the *Journal of Psychiatry & Neuroscience* if I am awarded the prize.
- _____ I attest to the accuracy of the information supplied in my application.

Signature

Date

Previous Heinz Lehmann Award Recipients

1982	T. L. Sourkes
1983	G. M. Brown
1984	B. Belleau
1985	P. Seeman
1986	S. Lal
1987	C. Fibiger
1988	C. de Montigny
1989	A. A. Boulton
1990	S. N. Young
1991	R. Quirion
1992	P. Grof
1993	K. K. Midha
1994	R. O. Pihl
1995	A. C. Cuello
1996	R. Joffe
1997	N. Barden
1998	B. Sherwin
1999	J. Stewart
2000	M. Steiner
2001	F. Vaccarino
2002	H. Steiger
2003	T. DiPaolo
2004	G. Chouinard
2005	M. Meaney
2006	L.T. Young
2007	H. Anisman
2008	W. Honer
2009	A. Phillips
2010	P. Blier
2011	R. Tyndale; D. Weaver
2012	G. Turecki
2013	S. George/B. Rusak
2014	G. MacQueen
2015	D. van der Kooy
2016	L. Yatham
2017	P. Albert
2018	A. Evans
2019	G. Rouleau
2020	M. Alda



CANADIAN COLLEGE OF NEUROPSYCHOPHARMACOLOGY
COLLÈGE CANADIEN DE NEUROPSYCHOPHARMACOLOGIE

CCNP Innovations in Neuropsychopharmacology Research Award **For Outstanding Innovations in Neuropsychopharmacology by an Individual or Group** **Sponsored by Pfizer Canada Inc.**

The Innovations in Neuropsychopharmacology Research Award is designed to recognize innovative research in neuropsychopharmacology by independent investigators. The Award consists of \$2,000 and a suitably engraved plaque. The Innovations in Neuropsychopharmacology Award shall be presented annually for work done primarily in Canada by Canadian scientists. Exceptionally, if there is no qualified nominee in the view of the Awards Committee, the award will not be given.

The decision of the Awards Committee will be based solely on the outstandingly innovative nature of the work by an individual or a group, as demonstrated by a single piece of research or by a body of work contributed over a number of years. Since science, by its nature, generates novel findings, the Awards Committee will seek more than the reporting of novel data. In particular, the committee will seek to identify contributions that have had a major impact in the field, for example: the introduction of a new research tool, or findings that lead to new avenues of research or successfully challenge the prevailing consensus. In assessing individual publications, the committee will consider citation history, but not to the exclusion of other information. For works by multiple authors, the particular contribution of the award nominee or nominated team (typically no more than 2 or 3) must be clearly specified. The Awardee(s) is/are expected to give a lecture based on his/her/their research at the Annual Meeting of the CCNP, and to contribute a manuscript, based on the lecture, to the CCNP official journal, the Journal of Psychiatry & Neuroscience, not later than six months after the lecture.

Nomination for 2021 Innovations in Neuropsychopharmacology Research Award

The names of nominees should be received by Dr. Jeff Daskalakis by **November 30th, 2020**. Supporting documentation must be received by **December 31st, 2020**. For each award, this documentation shall consist of:

1. A completed CCNP Innovations Award checklist, signed by the nominee.
2. A two-page summary prepared by the sponsor describing the nominee's work and what makes it innovative and influential, furthering the field of neuropsychopharmacology.
3. Up to 5 manuscripts or reprints considered by the sponsor to be pertinent to the nomination and which highlight the nominee's work.
4. The nominee's curriculum vitae.
5. A brief biographical sketch of the candidate prepared by the sponsor.

Formal presentation of the Award will be made to the recipient during the Annual Meeting of the College.

Note: The Innovations in Neuropsychopharmacology Research Award may be given for basic research or clinical research in alternate years. The 2021 Award will be presented for basic research.

Please send the name of the nominee and a short supporting letter to:

Dr. Jeff Daskalakis
CCNP President

*** Please send one copy of the above electronically to Dr. Daskalakis at jeff_daskalakis@camh.net and one copy to the CCNP Secretariat at rmena@ualberta.ca.
Deadline for receipt of initial nomination and short supporting letter is November 30, 2020.



CANADIAN COLLEGE OF NEUROPSYCHOPHARMACOLOGY
COLLÈGE CANADIEN DE NEUROPSYCHOPHARMACOLOGIE

**Innovations in Neuropsychopharmacology Award
For Outstanding Contributions to Neuropsychopharmacology
Sponsored by Pfizer Canada Inc.**

Checklist

- _____ Two-page summary of my work and its importance to neuropsychopharmacology.
- _____ Manuscripts and reprints pertinent to the nomination (maximum = 5)
- _____ My CV
- _____ Brief biographical sketch
- _____ I agree to be nominated for the 2021 Innovations in Neuropsychopharmacology Award.
- _____ If I am the award recipient, I will give a lecture at the 2021 CCNP annual meeting.
- _____ If I am the award recipient, I will contribute a manuscript to the CCNP journal, the *Journal of Psychiatry & Neuroscience*, within 6 months after the 2021 CCNP meeting.
- _____ 250-word abstract for a paper that could be submitted to the *Journal of Psychiatry & Neuroscience* if I am awarded the prize.
- _____ I attest to the accuracy of the information supplied in my application.

Signature

Date

Previous Innovations in Neuropsychopharmacology Award Recipients

1996	C. Fibiger, A. Phillips
1997	J. Bradwejn
1998	S. Gauthier, J. Poirier, R. Quirion
1999	G. Baker, R. Coutts, A. Greenshaw
2000	M. Diksic
2001	H. Robertson
2002	S. Lal
2003	No award given
2004	P. Seeman, S. Kapur
2005	No award given
2006	R. Tyndale
2007	N. Barden
2008	G. MacQueen
2009	S. Josselyn
2010	S. Weiss
2011	M. Szyf
2012	G. Remington
2013	X. Zhang
2014	A. Lozano
2015	M. Leyton
2016	D. Mueller, G. Robertson
2017	Y. Wang
2018	No award given
2019	C. Flores
2020	J. Meyer



CANADIAN COLLEGE OF NEUROPSYCHOPHARMACOLOGY
COLLÈGE CANADIEN DE NEUROPSYCHOPHARMACOLOGIE

Young Investigator Award

**For Outstanding Contributions to Neuropsychopharmacology by a Young Investigator
Sponsored by Pfizer Canada Inc.**

The Young Investigator Award is designed to recognize outstanding contributions in the field of research in neuropsychopharmacology by an individual young basic scientist or clinical investigator in Canada. Applications will be judged primarily on the basis of the candidate's work as an independent investigator. The Award consists of a \$2,000 honorarium and a suitably engraved plaque. The Young Investigator Award shall be presented annually for work done primarily in Canada by Canadian scientists, unless there is, in the view of the Awards Committee, no qualified nominee.

The major selection criterion is that the candidate be actively engaged in high quality neuropsychopharmacological research in Canada. There is no restriction concerning the field in which nominees have obtained their doctoral degree, but not more than ten years should have elapsed since the completion of their post-doctoral or residency training by July of the year of presentation. It is not required that the candidates be members of the College or have an academic appointment. The Awardee is expected to give a lecture based on his/her research at the Annual Meeting of the CCNP, and to contribute a manuscript based on the lecture to the CCNP official journal, the *Journal of Psychiatry & Neuroscience*, no later than six months after the lecture.

Nomination for 2021 CCNP Young Investigator Award

The names of nominees should be received by Dr. Jeff Daskalakis by **November 30th, 2020**. Supporting documentation must be received by **December 31st, 2020**. For each award, this documentation shall consist of:

1. A completed Young Investigator Award checklist, signed by the nominee.
2. A two-page summary prepared by the sponsor describing the nominee's work and its importance in furthering the field of neuropsychopharmacology.
3. Up to 5 manuscripts or reprints considered by the sponsor to be pertinent to the nomination and which highlight the nominee's work.
4. The nominee's curriculum vitae.
5. A brief biographical sketch of the candidate prepared by the sponsor.

Formal presentation of the Award will be made to the recipient during the Annual Meeting of the College

Note: The Young Investigator Award is given for basic research or clinical research in alternate years. The 2021 Award will be presented for clinical research.

Please send the name of the nominee and a short supporting letter to:

Dr. Jeff Daskalakis
CCNP President

*** Please send one copy of the above electronically to Dr. Daskalakis at jeff_daskalakis@camh.net and one copy to the CCNP Secretariat at rmena@ualberta.ca.

Deadline for receipt of initial nomination and short supporting letter is November 30, 2020.



CANADIAN COLLEGE OF NEUROPSYCHOPHARMACOLOGY
COLLÈGE CANADIEN DE NEUROPSYCHOPHARMACOLOGIE

Young Investigator Award
For Outstanding Contributions to Neuropsychopharmacology
Sponsored by Pfizer Canada Inc.

Checklist

- _____ Two-page summary of my work and its importance to neuropsychopharmacology.
- _____ Manuscripts and reprints pertinent to the nomination (maximum = 5)
- _____ My CV
- _____ Brief biographical sketch
- _____ I agree to be nominated for the 2021 Young Investigator Award.
- _____ If I am the award recipient, I will give a lecture at the 2021 CCNP annual meeting.
- _____ If I am the award recipient, I will contribute a manuscript to the CCNP journal, the *Journal of Psychiatry & Neuroscience*, within 6 months after the 2021 CCNP meeting.
- _____ 250-word abstract for a paper that could be submitted to the *Journal of Psychiatry & Neuroscience* if I am awarded the prize.
- _____ I attest to the accuracy of the information supplied in my application.

Signature

Date

Previous Young Investigator Award Winners

1987	A. J. Greenshaw
1988	B. Suranyi-Cadotte
1989	F. J. Vaccarino
1990	P. Blier, P.B.S. Clarke
1991	J. Bradwejn
1992	M. Martin-Iverson
1993	R. Joffe
1994	A. Gratton, J. Poirier
1995	G. Koren
1996	G. Robertson
1997	W. Honer
1998	J. Nalbantoglu
1999	S. Kapur
2000	No award given
2001	R. Joober
2002	S. Kar, C-D. Walker
2003	G. Turecki
2004	L-E. Trudeau
2005	J. Meyer
2006	S. Floresco
2007	M. Lepage
2008	T. Woodward
2009	J. Pruessner
2010	J-M. Beaulieu, C. Flores
2011	J. Daskalakis
2012	G. Gobbi
2013	L. Booij
2014	A. Barr
2015	S. Karama
2016	M. Chakravarty
2017	L. Palaniyappan
2018	I. Boileau, S. Borgland
2019	V. DeLuca
2020	C. Menard

Dr. Caroline Menard

2020 Young Investigator Award Recipient

The 2020 Young Investigator Award will be presented to Dr. Caroline Menard at the 43rd Annual Meeting of the Canadian College of Neuropsychopharmacology in Toronto, Ontario. The Young Investigator Award, sponsored by Pfizer Canada Inc., is designed to recognize outstanding contributions in the field of research in neuropsychopharmacology by an individual young basic scientist or clinical investigator in Canada.

Dr. Menard's research program aims at deciphering the neurobiology of mood disorders and stress resilience. Her lab combines behavioral experiments to functional, molecular, pharmacological and imaging studies and validate rodent findings in human samples to provide translational value to our basic projects. Despite being an independent faculty for only 2 years, she already secured over 3 million \$CAN including a Sentinel North Research Chair sponsored by Canada First Research Excellence Fund and funding from CIHR, NSERC, New Frontiers in Research Fund, FRQS and private foundations. Her team published several manuscripts in leading journals such as *PNAS*, *Neuron*, *Nature Biomedical Engineering* and the *European Journal of Neuroscience*. She has a broad background in neuroscience and psychiatric disorders with specific training and expertise in behavioral studies, vascular biology, immunology, pharmacology and brain plasticity. Her research includes 44 peer-reviewed publications (4 as corresponding author, 17 as first author, >2,000 citations, h-index: 22). Over the last decade she has been very active in the fields of mental health, psychiatry and neuropsychopharmacology, evidenced by a number of honors including a prestigious Young Investigator Award from the Brain & Behavior Research Foundation (USA) and a selection in the Quebec Science magazine Top 10 discoveries of the year. She is also part of the highly competitive American College of Neuropsychopharmacology (ACNP) travel award program which annually select distinguished young scientists in the field of neuropsychopharmacology.

Caroline obtained a BSc in Biophysics and a PhD in Biophysics & Cell Biology from the Université du Québec à Trois-Rivières (Canada) in the laboratory of Dr. Guy Massicotte. She then went on to perform postdoctoral training in Psychiatry at McGill University with Dr. Remi Quirion. This is where I met her for the first time in the context of a collaboration for one of her paper. In *J Neurosci* (Menard et al., 2013), she showed that knockdown of prodynorphin gene prevents cognitive decline, reduces anxiety and rescues loss of group 1 mGluR function in aging. She took advantage of pharmacological approaches such as positive modulators of mGluRs and antagonists of dynorphin-related opioid receptors to confirm that elevated prodynorphin expression impairs emotional regulation and cognitive behavioral processes. This innovative study allowed her to secure a 2nd postdoc position in the group of Dr. Scott J. Russo at the Icahn School of Medicine at Mount Sinai (New York, USA). There she directed a wide array of high impact work to uncover the neurovascular and neuroimmune interface that promotes greater stress vulnerability. In 3 short years, Caroline has coauthored a total of 21 manuscripts, published in *Nature*, *Nat Neurosci*, *Nat Med*, *Nat Commun*, *Mol Psychiatry*, *PNAS*, *J Neurosci*, *Sci Rep*, *Neurobiol of Stress*, *Neuroscience* and a special issue of *Neuropsychopharmacology* about the neuroimmune interface in depression (over 100 citations).

Her main project, which was published in *Nat Neurosci* (Menard et al., 2017) investigated the role of blood-brain barrier permeability and tight junction proteins in mediating vulnerability to social stress and major depressive disorder. This was the first comprehensive, functional analysis of blood-brain barrier integrity in the context of mood disorders. It combined behavioral

studies to imaging techniques, antidepressant treatments and viral-mediated manipulations. Her work was highlighted by *Nat Immunol*, *Nat Neurosci*, *Sci Transl Med*, *Nat Rev Neurosci* and cited 150 times already. She presented this project at the 2018 CCNP meeting.

Throughout her training, Caroline showed a remarkable degree of productivity publishing 40 manuscripts, along with over 40 professional meeting abstracts as first author. She has been invited to present her work at international conferences and has received numerous awards and honours, including the Governor General Academic gold medal, CIHR Age+ prize and the Quebec Network for Research on Aging Award for Excellence in Research. Her training in academia and industry was supported by scholarships and fellowships from the NSERC and CIHR.

This outstanding productivity led to her recruitment at the Department of Psychiatry and Neuroscience, Faculty of Medicine, Université Laval. Her lab is located at the CERVO Brain Research Center, one of Canada's leading neuroscience and mental health centers, focusing on the root causes of brain diseases. It brings together some sixty research in charge of research teams with more than 500 people offering multidisciplinary expertise, ranging from membrane biophysics to social intervention, and the psychology of cognition.

Since becoming a PI in 2018, Caroline already produced 4 manuscripts as corresponding author published in *Neuron*, *Nat Biomed Eng*, *Eur J Neurosci* and *PNAS*. In her recent study (*Dudek et al., PNAS, 2020*) they combined behavioral, pharmacological and cell-specific gene profiling experiments in mice with epigenetic, molecular and anatomical analysis of human samples to unravel mechanisms with therapeutic potential to protect the brain and promote stress resilience. As the official journal of the National Academy of Sciences (USA) and the 2nd most cited scientific journal, publication of her lab work in *PNAS* is giving tremendous exposure to her neuropsychopharmacology-related findings and was covered by several medias.

She developed a unique expertise and receives multiple requests to review manuscripts related to her research including for leading journals such as *Neuron*, *Nat Commun*, *Mol Psychiatry*, *Biol Psychiatry*, *PNAS* and *Neuropsychopharmacology*, the ACNP society journal. This is exceptional at this stage of her career. Proof of her growing international recognition she will be chair of upcoming symposiums at the Canadian Association for Neuroscience (Montreal, Canada), Society of Biological Psychiatry (New York, USA) and Japan Neuroscience Society (Kobe, Japan) annual meetings.

Her research program is well funded and combines her work on the neurovascular unit interface in depression and stress resilience, with her previous work on aging to delineate the mechanisms of increased comorbidity of psychiatric illness in inflammatory- and age-related pathologies such as cardiovascular diseases, obesity and diabetes. The mission of her Sentinel North Chair in the Neurobiology of Stress and Resilience aims to shed light on the biological mechanisms underlying vulnerability or resilience to stress, with the help of state-of-the-art photonic technology, in order to develop population-based or personalized innovative treatments to treat or even prevent depression and mood disorders. Caroline was awarded a highly competitive 5-year CIHR project grant in the last competition to explore sex-specific neurovascular adaptations driving stress-induced depression or resilience. She is also receiving funding from NSERC (5-year Discovery Grant) to investigate modulation of memory encoding by the blood-brain barrier and is co-PI on a New Frontiers in Research Fund Exploration grant with collaborators from her institution. The Canadian Foundation for Innovation is supporting her through the John R. Evans Leader Fund as does the *Fonds de Recherche du Québec* via a

Junior 1 salary award and the Brain and Behavior Research Foundation (NARSAD, USA) with a Young Investigator Award.

Caroline developed an extensive network of collaborators and is co-applicant on several large grants currently under review, for example the Canadian Brain Research Strategy (CIHR Network Catalyst Grants) or a CIHR platform dedicated to considering age and sex as biological variable in basic science research.

She is actively collaborating with clinicians to confirm her mouse findings on samples from patients including from Northern communities. Her ambitious research program combining basic research with translational approaches exposes her lab members to a dynamic research environment offering tremendous opportunity for multidisciplinary projects. Since she opened her lab she already recruited and directly supervised 13 trainees including a research associate, 1 postdoctoral fellow and 3 graduate students. Most of them secured independent funding confirming the quality of Caroline's lab and mentorship. She created a supportive, collaborative, creative and diverse research group including members from Canada but also Europe and South America which will be beneficial for her lab members training and future careers. Indeed, by developing a large toolbox they will be adequately prepared to face scientific challenges requiring an interdisciplinary vision and a wide skillset. She is supporting her students to attend local, national and international meetings – including CCNP annual meeting, 2 posters last year - as listed in her CV.

Not surprisingly, Caroline's work has been receiving increasing attention in the fields of psychiatric research and neuropsychopharmacology. She received a highly competitive travel award to attend annual meetings of the ACNP and was invited to present her work at Hot Topic sessions. The ACNP travel award program selects distinguished young scientists in the field to attend the annual meeting for 5 years after which they are invited to submit their application to become member of the College. Caroline is planning to apply this year to become an Associate Member, the 1st step to become full member of this prestigious College.

Dr. Caroline Menard is undoubtedly a most worthy co-recipient of the CCNP 2020 Young Investigator Award. Congratulations to Dr. Menard!

Dr. Martin Alda

2020 Heinz Lehmann Award Recipient

The 2020 Heinz Lehmann Award will be presented to Dr. Martin Alda at the 43rd Annual Meeting of the Canadian College of Neuropsychopharmacology in Toronto, Ontario. The Heinz Lehmann Award, which is sponsored by Pfizer Canada Inc., is presented annually for work done primarily in Canada by Canadian scientists.

Martin Alda, MD, FRCPC is a Professor of Psychiatry and Killam Chair in Mood Disorders at Dalhousie University in Halifax, Canada. He also holds appointments at McGill University, University of Pittsburgh, and at the National Institute of Mental Health in the Czech Republic. Clinically, Dr. Alda works as the head of the Mood Disorders Program at the QEII Health Sciences Centre in Halifax.

Dr. Alda received his medical degree from Charles University in Prague. He trained in psychiatry at Charles University and at the University of Ottawa. Prior to his arrival in Halifax, Dr. Alda held Canada Research Chair at McGill University.

Dr. Alda has made significant contributions to the psychiatric science in several areas including 1) optimization of long term treatment of bipolar disorder through pharmacogenetic and neurobiological studies of mood stabilizers; 2) mapping genes for bipolar disorder using innovative phenotypic approaches; 3) better understanding of the brain structure and function in the development and progression of mood disorders; and 4) studies of factors affecting the outcome of bipolar disorder.

Dr. Alda published over 320 original papers and book chapters; his current h-index is 55 (Web of Science, January 2020).

Dr. Alda is an international leader in research on the biological mechanisms underlying mood disorders and their treatment, and an outstanding example of an accomplished clinician-scientist. He is especially well known for his work on bipolar disorder, a disabling psychiatric condition with major personal and societal impacts. His contributions and leadership have been recognized with extensive grant funding, personal awards and appointments to leading national and international institutions, as documented in his *curriculum vitae*.

Through his mentorship and collaboration, he has also supported the development of the next generation of clinician-researchers in mood disorders, both in Canada and internationally. Many of these junior colleagues are now themselves leaders in their respective clinical research fields.

Dr. Alda's translational research on bipolar disorder has been focused on three related areas. The first is the genetic and neurobiological basis of treatment responsiveness in bipolar disorder. He demonstrated that a subtype of bipolar disorder that is responsive to lithium treatment is a highly heritable form of the illness with distinct clinical and neurobiological features. This work opens the possibility for more rapid and effective treatment of people with bipolar disorder. Dr. Alda was the first to demonstrate that responsiveness to lithium treatment is characteristic of family lineages. He also developed a rating scale to evaluate responsiveness to treatment; the scale is now accepted as an international standard, and the treatment response ratings are commonly referred to as "Alda scores".

He co-founded a worldwide consortium, ConLiGen, that completed the largest pharmacogenomic study in psychiatry to date, providing evidence for a genetic factor associated with lithium responsiveness. Dr. Alda is a senior author on a paper reporting the ConLiGen results in *The Lancet*. Further validation of these findings involved development of highly innovative cellular models of bipolar disorder, based on pluripotent stem cells and derived neurons (published in *Nature* and *Proceedings of the National Academy of Sciences USA*, among others).

Dr. Alda's second area of research relates to studies of children of people with bipolar disorder, who are at elevated genetic risk of developing the condition. In collaboration with Dr. Tomas Hajek, he identified specific structural brain changes as a risk factor for development of the illness in at-risk children. More recently, Drs. Alda and Rudolf Uher (whom he recruited to Dalhousie) co-founded a large-scale, longitudinal project to assess whether early interventions in such at-risk children can reduce the risk of developing serious mental illness.

The third research area relates to factors that influence the long-term course of the illness and its outcome. In particular, in a series of studies on suicide behaviour in people with bipolar disorder, Dr. Alda showed that the risk of suicide is a heritable characteristic, associated with specific molecular markers, and confirmed that risk can be reduced by treatment with lithium. Dr. Alda and colleagues have also demonstrated that metabolic abnormalities in bipolar patients increase the risk of poor outcomes. Insulin resistance (a pre-diabetic symptom), for example, is highly prevalent in this population; its presence reduces the chances of successful treatment outcomes more than eight-fold.

Currently, Dr. Alda lists 297 published or in press peer reviewed papers; his work has been cited more than 10,800 times (over 1,400 times in 2019) and his h-index is 55 (based on Web of Science).

Dr. Alda's impressive research contributions should be seen in the context of his continuing responsibilities in running a large clinical program. He has touched the lives of thousands of patients to whom he has provided direct and indirect care. He has brought world-class quality of care to those with mood disorders in a region where patients often struggle to find adequate specialist care. His leadership in integrating clinical care with cutting-edge research programs provides the basis for the advancement of evidence-informed care and serves as a model for trainees of contributing to the full breadth of academic medicine. It is this combination of intensive longitudinal clinical focus with application of modern genetic, biological and imaging methods that has allowed him to achieve some of the most robust and replicated results in mood disorders research.

Dr. Alda has had an important impact in fostering the next generation of Canadian and international psychiatrists. He has always generously supported junior colleagues and his peers. Some of those he has mentored have gone on to make major contributions to medicine, including Gustavo Turecki (now Professor and Chair of Psychiatry at McGill University), Anne Duffy (Professor of Psychiatry at Queens University), and Tomas Hajek (Professor of Psychiatry at Dalhousie University and Charles University in Prague). Dr. Alda's expertise, advice and collaboration have been sought by numerous groups internationally, and he has worked tirelessly to forge research and clinical linkages among those working on bipolar disorder around the world.

Dr. Alda's achievements have been acknowledged by numerous awards and visiting positions. He held a Tier 1 Canada Research Chair at McGill University and since 2007 has held the

Killam Chair in Mood Disorders at Dalhousie. His international reputation has resulted in his serving as a visiting professor at the University of Cagliari, Italy, as a visiting senior scientist at the National Institute of Mental Health in the Czech Republic, and as an adjunct professor at McGill University, Charles University in Prague and the University of Pittsburgh in the USA. He has won some of the most prestigious awards in the field of psychiatric research, including a NARSAD Independent Investigator Award, the Douglas Utting Award and Mogens Schou Award for research.

He has served the research community as a reviewer for agencies in the USA, UK, Israel, Australia and several European countries, as well as serving as Chair of the Behavioural Sciences committee for the Canadian Institutes of Health Research in Canada. He has been elected as a member of the American College of Neuropsychopharmacology and a fellow of the International College of Neuropsychopharmacology. He is regularly invited to give keynote and named lectures (e.g., The Mogens Schou Lecture on pharmacogenetics of lithium at a CINP Congress, and plenary lectures at the European Psychiatric Association Congress and World Psychiatric Congress).

In summary, Dr. Martin Alda has made significant contributions to the field of neuropsychopharmacology and is a very worthy recipient of the 2020 Heinz Lehmann Award. Congratulations to Dr. Alda!

Dr. Beverley Orser

2020 CCNP Medal

The 2020 CCNP Medal will be presented to Dr. Beverley Orser at the 43rd Annual Meeting of the Canadian College of Neuropsychopharmacology that will be held in Toronto, Ontario. This Award, sponsored by Pfizer Canada Inc., honours individuals for a meritorious career in, and outstanding contribution to, neuropsychopharmacology in Canada as evidenced by their activities in education, administration and/or patient care.

Dr. Orser is a clinician-scientist and Chair of the Department of Anesthesiology and Pain Medicine at the University of Toronto, Co-Director of the Perioperative Brain Health Centre and a practising anesthesiologist at Sunnybrook Health Sciences Centre, Toronto, Canada. Her bench research aims to understand the molecular mechanisms of general anesthetic drugs and determine how the brain changes after anesthesia and surgery. Her laboratory first identified the unique pharmacological properties of extrasynaptic GABAA receptors then advanced our understanding of how these receptors contribute to health and disease. Her clinical research has improved patient safety by preventing catastrophic events, particularly medication errors for patients in emergency departments, operating rooms and other critical care environments.

Dr. Orser is a leading investigator in the field of neuroscience and a passionate advocate for patient safety. The amino acid γ -aminobutyric acid (GABA) is the principal inhibitory neurotransmitter in the brain. Dr. Orser pioneered the study of extrasynaptic GABAA receptors and was the first to identify the role of these receptors in health and disease. Dr. Orser's major scientific accomplishment in this area was to demonstrate the unique physiological and pharmacological properties of these receptors. She then characterized their potential as therapeutic targets for neuropsychiatric and neurological disorders such as depression, autism spectrum disorder, postoperative cognitive dysfunction and epilepsy. Her studies showed that these receptors generate a powerful "tonic" inhibitory conductance in neurons, which is targeted by multiple classes of psychoactive drugs, including benzodiazepines, general anesthetics and gabapentinoids. These findings created a paradigm shift by focusing attention and drug discovery on the extrasynaptic GABAA receptors. In addition, this work has resulted in patents for new treatments, clinical trials, guidelines and establishment of the Perioperative Brain Health Centre (<http://www.perioperativebrainhealth.com/>), the first of its kind in the world. Dr. Orser has been recognized for her substantial body of work with numerous prestigious honours, including a Foundation Grant from the Canadian Institutes of Health Research, a Canada Research Chair and election to US National Academy of Medicine, the Royal Society of Canada and the Canadian Academy of Health Sciences.

Translational Neuroscience: Dr. Orser is a clinician-scientist, Chair of the University of Toronto's Department of Anesthesiology and Pain Medicine and a practicing anesthesiologist at Sunnybrook Health Sciences Centre. Her research lab is located within the Department of Physiology at the University of Toronto, where she has worked as a "bench scientist" for more than 30 years. Her studies were first driven by such vexing questions as "What is the molecular basis of general anesthesia?" and "What are the causes of the adverse effects of neurodepressive drugs?" This work then led to studies of the molecular basis for delirium, cognitive deficits and mood disorders, which commonly occur in hospitalized patients. Dr. Orser's team uses complementary experimental methods, including electrophysiological studies, biochemical assays, behavioral assays and mouse models, to show how changes in the activity of extrasynaptic GABAA receptors correlate with changes in animal behaviour and

human disorders. In addition, in collaboration with leading clinical investigators, she studies the repurposing of anesthetic drugs (specifically ketamine and nitrous oxide) for the treatment of mood disorders and postoperative cognitive disorders.

One example illustrating the impact of her work relates to delirium, a common and debilitating neurological disorder that occurs in many older patients who undergo surgery. Postoperative delirium is associated with poor long-term outcomes and increased mortality, yet no effective treatments exist. Using mouse models, Dr. Orser showed that anesthetic drugs and inflammatory factors such as cytokines trigger a persistent increase in extrasynaptic GABAA receptor activity. She then identified several mitigation strategies that have led to clinical trials, currently in progress.

Other preclinical studies conducted in Dr. Orser's lab showed that drugs that up-regulate (e.g., gabapentin) or down-regulate (e.g., tranexamic acid) the activity of extrasynaptic GABAA receptors also cause cognitive deficits and seizures, respectively. Several clinical studies are now under way to examine the effectiveness of ketamine and nitrous oxide in treating refractory depression and the potential of dexmedetomidine to prevent delirium and postoperative cognitive deficits.

Dr. Orser has published more than 200 peer-reviewed articles. Many of these have appeared in elite journals, including *The New England Journal of Medicine*, *The Lancet*, *Nature*, *Nature Medicine*, *Nature Neuroscience*, the *Journal of Clinical Investigation* and *Proceedings of the National Academy of Science*. Her h-index is 56 (Google Scholar, 13,189 citations). Dr. Orser has described her work in numerous keynote addresses presented in Canada and abroad. In addition, her research has achieved international prominence in the public media and the lay press, as evidenced by invited reviews (e.g., *Scientific American*) and media interviews (e.g., with CBC, CTV and the international press).

Advocate for Patient Safety: In addition to producing a substantial body of scientific research, Dr. Orser has developed novel initiatives that have improved medication safety. Central to this work has been the need to prevent catastrophic errors involving patients receiving high-risk drugs in complex environments such as the emergency department and operating rooms. She co-founded the Institute for Safe Medication Practices Canada (ISMP Canada; <https://www.ismp-canada.org/>), a not-for-profit organization that is Canada's national reporting agency for medication errors. She established and Chaired the committee that developed the first national standard for labels on drug ampoules and vials, which is now referenced by Health Canada and the World Health Organization. She co-founded the Patient Safety Committee of the Canadian Anesthesiologists' Society and co-created the world's first Perioperative Brain Health Centre, as described above.

In addition to this work on behalf of patients of all ages, Dr. Orser has made special efforts for those in their early years. It is known that prolonged or repeated exposure to anesthetic drugs early in life is associated with long-term neurobehavioural disorders later in life, including attention deficit hyperactivity disorder. In collaboration with the US Food and Drug Administration and the International Anesthesia Research Society, Dr. Orser co-leads a program called SmartTots (Smarttots.org), which aims to prevent the neurotoxic effects of anesthetic drugs in children.

Dr. Orser has led or co-led national and international initiatives. For example, she founded or co-founded ISMP-Canada (www.ismp-canada.org), the world's first Perioperative Brain Health Centre (www.perioperativebrainhealth.com) and the first standard for labels on drug ampoules

and vials in Canada (CAN/CSA-Z264.2-99). Her contributions have been recognized by awards including a Gold Medal from the Canadian Anesthesiologists' Society (2017), the Peter Dresel Award in Pharmacology from Dalhousie University (2017), a Canada Research Chair (2003), the first Frontiers in Anesthesia Research Award from the International Anesthesia Research Society (1995), the Excellence in Research Award from the American Society of Anesthesiologists (2018) and the Australian and New Zealand College of Anaesthetists. She is an elected Fellow of the Canadian Academy of Health Sciences (2013), a Fellow of the Royal Society of Canada (2018) and an International Member of the US National Academy of Medicine (2018).

Dr. Beverley Orser is undoubtedly a most deserving and worthy recipient for the 2020 CCNP Medal. Congratulations to Dr. Orser!

Dr. Jeffrey Meyer
2020 Innovations in Neuropsychopharmacology Award
Recipient

The 2020 Innovations in Neuropsychopharmacology Award will be presented to Dr. Jeffrey Meyer at the 43rd Annual Meeting of the Canadian College of Neuropsychopharmacology in Toronto, Ontario. The Innovations in Neuropsychopharmacology Award, sponsored by Pfizer Canada Inc., is presented annually for work done primarily in Canada by Canadian scientists.

Dr. Jeffrey Meyer is a Tier 1 Canada Research Chair in the Neurochemistry of Depression and leads the Neurochemical Imaging Program in Mood and Anxiety Disorders at the Campbell Family Mental Health Research Institute at CAMH. He is also a full professor at the University of Toronto Department of Psychiatry. Initially Dr. Meyer completed his medical school and graduate studies at the University of Toronto, and then completed fellowship training at Imperial College in London, England. After this he returned to the University of Toronto and CAMH.

Dr. Meyer has made a number of replicated discoveries including the first definitive evidence of neuroinflammation during major depressive episodes and obsessive compulsive disorder; that monoamine oxidase A level is elevated throughout the grey matter during major depressive episodes, that serotonin reuptake inhibitor medications block 80% of their target at clinical doses and that monoamine oxidase B binding is increased in the prefrontal cortex during major depressive episodes. Much of his recent research focuses on neuroinflammatory markers in major depressive disorder. He is an author on more than 100 peer-reviewed papers in journals including 19 papers as a lead/senior author in *JAMA Psychiatry/Archives of General Psychiatry* and the *American Journal of Psychiatry* as well as other journals such as *lancet psychiatry* and *PNAS*. Dr. Meyer's research has a strong translational component, and he has experience in a variety of techniques and technologies extending from a PET imaging focus including early phase and late phase clinical trials of therapeutics, natural health product development and advancement of peripheral biomarkers.

He has received several important awards for this work including the AE Bennett award from the Society of Biological Psychiatry, the Royal College Medal Award in Medicine, the Samarthji Lal award from the Graham Boeckh Foundation and the John Dewan Prize from the Ontario Mental Health Foundation.

In 2015, Dr. Meyer published a seminal finding confirming neuroinflammation throughout grey matter regions in the brain including within affect modulating brain circuits during major depressive episodes (MDE), (*JAMA Psych 2015, cited >380 times, also Lancet Psychiatry 2018*). Translocator protein (TSPO) PET imaging was applied and when TSPO VT, an index of TSPO density is elevated this is indicative of gliosis. This finding is already replicated across four sites spanning 142 MDE cases and 93 controls. A fifth site with a preliminary sample (Yale) has a positive finding in the subset with current MDE amongst a sample mixed with recovered MDD. The key study by Dr. Meyer addressed the initial skepticism of the neuroinflammatory theory of depression due to a lack of brain evidence, and is pushing the PET neuroimaging field as well as the postmortem brain field towards further investigations of selective inflammatory targets and processes in MDE. Because elevated TSPO binding was found within the neurocircuitry of MDE, this study is cited as key justification for current pharmaceutical development of inflammatory modulating medications for MDE at major pharmaceutical

companies, such as Boehringer for their 2,3 indoleamine dioxygenase inhibitors and at Janssen for their P2X7 inhibitors.

Dr. Meyer has extended the TSPO imaging direction into two important research directions. One is neuroprogression of MDD. As the committee is aware, MDD frequently exhibits a course of increasing recurrence and persistence of MDE. However, despite a number of plausible mechanisms, evidence for neuroprogression (ie, quantitatively increasing brain pathology with longer duration of illness) is scarce, with decreased hippocampal volume having been the most prominent, consistent finding, being ~4% difference between MDE and health. In 2018 in *Lancet Psychiatry* Dr. Meyer discovered progressively greater TSPO binding with greater duration of untreated illness in the prefrontal, anterior cingulate and insular cortex of a sample of 51 MDE subjects. This study showed that the greatest elevation of TSPO binding was approximately 30 to 40% in those with 10 or more years of untreated MDD. Greater gliosis is considered an indicator of neuroprogression in degenerative diseases but it is conceptually novel that neuroprogression is occurring in the circuits of MDD; and this is the first large magnitude, pathological change with progression of illness demonstrated in MDD.

The second important extension of TSPO imaging was in OCD. Although, autoimmune disease has been theoretically implicated in the pathophysiology of OCD; a critical gap in the literature was a lack of evidence for inflammation in the brain in OCD. Dr. Meyer demonstrated with PET imaging that TSPO binding is particularly elevated in the corticostrialthalamocortical circuit of OCD (~30%), a robust finding that should be straightforward to replicate. This finding is impactful in the OCD field because it is the first definitive evidence of neuroinflammation in the corticostrialthalamocortical circuit and it is prompting further investigations of neuroinflammation and development of therapeutic interventions targeting gliosis in OCD.

Earlier in his career, after publishing a number of influential PET papers that further advanced the monoamine theory of depression, demonstrating that receptors sensitive to changes in monoamine concentrations show regional binding changes linked to alterations in symptoms (*Am J Psych* 2003, 2004, 2006), Dr. Meyer moved his research in a related but divergent direction, leading a series of important studies investigating the enzyme, MAO-A. While MAO-A is commonly known for metabolizing monoamines, it also has key roles in generating oxidative stress signaling, predisposition towards apoptosis and mitochondrial function. Prior to his work, it was generally believed that monoamine oxidase A (MAO-A) levels were normal in major depressive disorder but Dr. Meyer's studies indicate otherwise. Applying PET with a radioligand that binds to the functional region of MAO-A, Dr. Meyer found that MAO-A distribution volume values, an index of MAO-A level are increased by 35% during MDE in brain regions that regulate emotion including the prefrontal cortex, anterior cingulate cortex and hippocampus (*Arch Gen Psych/JAMA Psych* 2006 cited ~550 times). He replicated these findings and an independent laboratory at the University of Mississippi subsequently reported similar magnitude results for protein level and activity in postmortem tissue. He expanded these investigations to address recurrence, antidepressant non-response, illness specificity, illness subtype and illness risk, linking MAO-A binding within the prefrontal and anterior cingulate cortex to mood state and vulnerability to MDE, postpartum MDE, depressed mood in perimenopause, depressed state of alcohol abuse disorder, withdrawal from heavy nicotine abuse, and the dysphoria of borderline personality disorder (*Arch Gen Psych/JAMA Psych* 2006, 2009, 2010, 2011, 2014, *Biol Psych* 2014, 2016, *Neuropsychopharm* 2014, 2015). More recently, to detect this high MAO-A level phenotype of MDD in clinical settings, he is discovering low cost predictors of elevated MAO-A level, applying symptom measures, concentration of plasma peptides of MAO-A and genotype; with symptoms predicting 45% of the variance. The MAO-A studies are highly cited and continue to have tremendous research traction and influence in the areas of mitochondrial

function/disease, miRNA and MAO-A transcription/translation, neuroimaging, neurodegenerative disease and biomarker development.

Within the line of PET studies investigating MAO-A binding in health in disease, Dr. Meyer discovered that MAO-A level was elevated by over 40% during the postpartum blues (*Arch Gen Psych/JAMA Psych 2010*), and advanced this into a model of nutraceutical development to enhance resiliency. Although postpartum blues is a healthy range syndrome, when severe it is associated with a fourfold greater risk of postpartum depression. MAO-A level is typically highly correlated with MAO-A activity in brain tissue. To counter the 40% temporary rise in MAO-A distribution volume in early postpartum, he invented a dietary kit composed of tryptophan, tyrosine and blueberry extract with blueberry juice and demonstrated that they completely eliminate the effects of depressed mood induction during the postpartum blues during open trial with an effect size of 2.9 (*PNAS 2017*). Dr. Meyer brought depressed mood induction, a robust method of activating affect related circuits, into the postpartum field for assessment of resiliency in early postpartum and this approach in combination with the nutraceutical has been well accepted, being presented in symposium or plenary talks at all the major international postpartum conferences. The ingredients were specifically chosen based on a combination of brain penetration and safety; and he had previously empirically demonstrated that these amino acids do not affect their total concentration in breast milk because 99% of these amino acids are found in proteins which are not readily influenceable (*Arch Wom Ment Health 2014, Eur Neuropsychopharmacol 2015*). Dr. Meyer now leads a randomized double blind placebo controlled trial to assess impact on early postpartum mood that is approximately 15% complete. This line of investigation shows an innovative approach to develop nutraceuticals through detecting a central biomarker abnormality in a prodromal state, and, after addressing safety issues, investigating the effect of the nutraceutical on resiliency to a paradigm that stresses affect regulation.

This year Dr. Meyer applied PET to discover that MAO-B VT, an index of monoamine oxidase B level is often elevated within the prefrontal cortex and its subregions in MDE with 50% (10 of 20) of patients with MDEs having MAO-B VT values in the PFC exceeding those of healthy controls (*JAMA Psych 2019*). This finding is important because MAO-B overexpression is associated with pathologies of mitochondrial dysfunction, elevated synthesis of neurotoxic products, increased metabolism of non-serotonergic monoamines as well as behaviors in rodents of reduced exploration and activity. Although MAO-B is a well known enzyme, there were only two previous investigations of MAO-B confined to the dorsal raphe and amygdala and this target was not considered important in antidepressant development, being perceived as an off-target effect in MDE. Now, with this finding in MDE, Dr. Meyer is in the process of contacting companies with selective MAO-B inhibitors compatible with SSRI use that do not require dietary restrictions, to repurpose their therapeutics for MDE. An example of such is sembragiline, which went through phase 2 trials in Alzheimer's disease and had positive effects on associated behavioural symptoms.

Dr. Meyer also spearheaded seminal PET antidepressant occupancy studies that led this to being a standard tool in antidepressant development. Dr. Meyer discovered that steady state dosing of common SSRIs at doses that distinguish from placebo in clinical trials is associated with an 80% occupancy of the serotonin transporter in affect modulating brain regions (*Am J Psychiatry 2001, 2004, cited >350, >400 times respectively*). The finding was compelling because occupancy was assessed at a wide range of dosing across five well established SSRI, results were highly robust, and replicable. Antidepressant occupancy studies for the serotonin transporter hastened the development of several antidepressants such as levomilnacipran, fetzima, and vortioxetine; and the general strategy of antidepressant occupancy continues to be

applied for novel therapeutics in development for MDE such as PDE4, and P2X7 inhibitors. In general, brain penetration with PET occupancy studies is now a standard in antidepressant development such that near the time of phase 1 clinical trials, most major pharmaceutical companies assess occupancy. This enables prioritization across candidate therapeutics, go-no go decisions for further clinical development and optimization of dose, hastening development of therapeutics.

Dr. Jeffrey Meyer is an undoubtedly most deserving and worthy recipient for the 2020 CCNP Innovations in Neuropsychopharmacology Award. Congratulations to Dr. Meyer!