advances in neuroscience, no widely accepted biomarker is available to assist diagnostics or treatment choice for individual patients. Neuroimaging using fMRI is useful to investigate the pathophysiology of MDD and aid in the identification of biomarkers of treatment response. Traditional task-based fMRI analysis has used statistical approaches to locate areas of the brain which are activated differently between patients and control subjects. Several fMRI studies on responses to emotional stimuli found an association between greater baseline activity in regions throughout the dorsal-ventral extent of anterior cingulate (ACC) - medical prefrontal cortex (mPFC) and better treatment response to SSRI medications in depression. Another fMRI study reported that greater pretreatment amygdala activity predicted better outcome of cognitive-behavioral therapy (CBT). These studies suggest that measures of activity in ACC, mPFC and amygdala may differ in patients who benefit from psychotherapy compared with SSRIs.

More recently, resting-state fMRI has become increasingly popular to study for understanding brain network dynamics in MDD. The key findings in neural circuits supporting implicit emotion regulation and reward processing indicate either abnormally increased resting connectivity between amygdala and striatum, and ACC and ventromedial PFC, and decreased resting connectivity between subgenual ACC and cortical areas. Subcortical-ACC resting-state connectivity has shown an increase after SSRI treatment. Such abnormal resting-state connectivity between brain regions may be possible predictors of antidepressant response.

However, it is unlikely that a single clinical or biological marker can guide treatment selection, therefore multiple biological measures may be needed to provide more reliable markers to guide treatment. Recently, computational neuroscience techniques using machine learning are also applied for neuroimaging studies. In our laboratory, we found that the combination measurement of Childhood Abuse Trauma Scale (CATS) and the resting-state connectivity between angular and default mode network - executive network may be able to predict the non-responder for SSRI.

In this lecture, the recent neuroimaging studies including our current research on treatment response in depression will be reviewed and discussed.

**Speaker 4: Brian Dean, Australia**  
**Title:** Serotonin 2A receptor in depression and suicide

**Abstract**  
The serotonin 2A receptor is one of the most abundant serotonin receptors in the human CNS and is a target for drugs designed to treat psychiatric disorders (McCory and Roth, 2015). Significantly, levels of serotonin 2A receptors have been shown to be altered in the CNS of subjects with schizophrenia (Dean, 2003), major depressive disorders (Arora and Meltzer, 1989; Dean et al., 2014) and suicide completers (Mann et al., 1986; Dean et al., 2014). These findings raise the issue of whether or not changes in levels of the serotonin 2A receptor s are involved in a drive to suicide or are changed in the CNS of suicide completers because they have suffered from disorders such as schizophrenia or major depressive disorders in which there are changed levels of the receptor. In this presentation the current literature on changes in serotonin 2A receptors, as measured by neuroimaging and postmortem CNS studies, will be reviewed in the context of unravelling the role of these changes in the aetiology of psychiatric disorders versus a drive to suicide completion. In addition, the growing understanding of the regulation of levels of serotonin 2A receptors in the CNS will be discussed within the framework of understanding how changes in the receptors may have a role in the aetiologies of psychiatric disorders and their involvement in a drive to suicide.

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**S7: The role of Short and Long Non-coding RNA in Mental Illness**

**Chair:** Gustavo Turecki, Canada  
**Co-Chair:** Alexandra Sulcova, Czech Republic

**Speaker 1: Alon Chen, Germany & Israel**  
**Title:** The role of specific microRNAs in regulating stress-linked behaviors

**Alon Chen**  
**Department of Stress Neurobiology and Neurogenetics, Max Planck Institute of Psychiatry, Munich, Germany and Department of Neurobiology, Weizmann Institute of Science, Rehovot, Israel

**Abstract**  
The role of specific microRNAs in regulating stress-linked behaviors

The fine-tuning of gene expression determines both normal and pathological behavior. Posttranscriptional regulation by microRNAs (miRNAs) offers a new approach for studying dysregulation of psychopathology-related behaviors. Recent studies reveal that miRNAs expression profile in blood circulation correlates with psychiatric disorders, and may offer a novel diagnostic tool. Furthermore, manipulating the levels of miRNAs is emerging as a potential treatment of stress-linked psychopathologies. In this lecture, we will discuss the experimental approaches using human subjects, animal models, cellular systems and bioinformatics to advance our knowledge on miRNAs role in stress-related mental conditions and will describe our recent findings in this field (describe in part at the below publication).

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**Speaker 2: Claes Wahlestedt, USA**  
**Title:** Understanding and Drugging the Epigenome and the Non-Coding Transcriptome

Claes Wahlestedt, MD PhD