Mapping Emotions and Social Function in the Brain

Thursday, Jun 21: 10:30 AM - 11:45 AM
Oral Sessions
Thursday - Oral Session

Presentations

1534: Multilocus genetic profile scores account for gender differences in reactivity of the reward system

10:30 AM - 10:42 AM
The neurotransmitter dopamine is well known for its involvement in reward processing and has a key role in modulating the responsiveness of the reward circuitry (Sesack, 2010). In order to explore the biological mechanisms mediating individual functional responsiveness of the dopamine system we used a multilocus genetic composite (MGC; Nikolova, 2011) approach rather than focusing on independent effects of single polymorphisms with only modest impact. Therefore, we compiled individual MGC profile scores reflecting the additive effects of alleles conferring relatively exaggerated dopamine signaling across six polymorphic loci: DRD 2 Taq1A, DRD 2 C957T, SNP2*, SNP17*, SNP19* (*labeling according to Zhang, 2007) and DARPP-32. We investigated the combined effect of these six functional polymorphisms on reward-related functional activity and connectivity within the reward circuitry using a fMRI reward-related decision making paradigm.

Presenter

Anja Richter, Heidelberg University

1515: Bidirectional Modulation between Temporal Pole and Amygdala in Emotion Processing:A Stereo-EEG study

10:42 AM - 10:54 AM
Amygdala and orbito-frontal cortex (OFC) are most commonly linked to socio-emotional processing. The role of the temporal pole (TP) that connects to both these regions is less clear. fMRI literature has only inconsistently reported TP activation in social-emotional tasks which can partly be explained by susceptibility artefacts near air-bone interfaces. In this study, we took advantage of intracranial recordings from temporal pole and amygdala in patients with intractable epilepsy to investigate the role of TP and amygdala in emotional processing.

Presenter

Saurabh Sonkusare, QIMR Berghofer

1501: Closed-loop amygdala neurofeedback using emotional faces

10:54 AM - 11:06 AM

The ability to regulate one's internal affective states and response to perceived emotions, such as emotional faces, is an important aspect of personal well-being and functioning within a social group. Abnormalities in these regulation mechanisms have been associated with a variety of psychiatric disorders. Real-time fMRI-based neurofeedback (NFB) of the amygdala, which is involved in emotion processing, has been suggested as a viable training method to support people in improving their emotion regulation capabilities (Bruhl et al., 2014; Linden et al., 2012; Young et al., 2017; Zotev et al., 2011). The amygdala is particularly responsive to faces and, in this context, exhibits abnormal reactivity (Phan et al., 2006; Sladky et al., 2012) and connectivity (Minkova et al., 2017; Sladky et al., 2015) in affective disorders. Additionally, there is evidence that amygdalar activation scales with the intensity of the emotional images (Karlsson et al., 2010) and faces (Wang et al., 2017). Based on these notions, we conceived a new closed-loop NFB paradigm where we used emotional faces with dynamically changing stimulus intensities depending on the subject's amygdala activation. Such closed-loop feedback is more motivating and increases the participant's sense of agency. At the same time, there is no task interference between the processing of naturalistic affective stimuli and NFB presentation (e.g., displayed as numbers or scales). This new approach might facilitate modulation of the amygdala response to emotional stimuli in order to improve emotion regulation in health and disease.

Presenter

Ronald Sladky, University of Zurich

1521: Emotions induced by naturalistic stimuli explain right hemisphere activity in an independent sample

11:06 AM - 11:18 AM

Emotions are biologically rooted mechanisms that play a pivotal role in daily social interactions[1], elicited not only by direct first-person interactions, but also by simply watching interactions among other individuals. Indeed, drama have been known to induce emotional states in the audience and nowadays movies reproduce the immersiveness of social situations to a point that viewers can relate to character states, ultimately leading to 'emotional contagion' in a naturalistic way[2]. Given the cultural independent meaning of emotions, we hypothesized that the timecourse of the inner experience elicited by an emotionally-charged movie would predict brain activity in an independent sample of individuals exposed to the same stimuli.

Presenter

Giada Lettieri, IMT School for Advanced Studies Lucca

2417: Oxytocin Sex-dependently Increased Intrinsic Cooperation between Default and Salience Network

11:18 AM - 11:30 AM

Overarching frameworks on the modulatory role of the neuropeptide oxytocin (OXT) on behavior propose that OXT regulates attention via modulating the salience of social-emotional cues (Shamay-Tsoory and Abu-Akel 2016), with the specific effects being dependent on contextual as well as personal factors, including sex (Gao, Becker et al. 2016). Accumulating evidence suggests that the modulatory effects of OXT on attention and salience processing may be based on the regulatory role of OXT on intra- and inter-network communication (Johnson, Walum et al. 2017). From a large-scale intrinsic network perspective attention and salience processing depend on the interactions between the default network (DN) with the dorsal attention (DAN) and the salience network (SN) (Christoff, Irving et al. 2016). The present resting-state pharmaco-fMRI study employed an independent component analysis (ICA)

approach to (1) determine the modulatory effects of OXT on the intrinsic connectivity between these large-scale networks and, (2) to examine whether these effects are sex-dependent.

Presenter

Fei Xin, University of Electronic Science and Technology of China

2625: Stomach-brain coupling reveals a novel, delayed connectivity resting-state network

11:30 AM - 11:42 AM

Resting-state networks (RSNs) offer a unique window into the brain's functional architecture (Fox and Raichle, 2007), but their characterization remains so far limited to instantaneous connectivity. In addition, visceral organs provide continuous input to several brain regions (Critchley and Harrison, 2013), which may influence spontaneous activity. In particular, the stomach intrinsically produces a slow (0.05 Hz) electrical rhythm that can be measured noninvasively with the electrogastrogram (EGG, Koch and Stern, 2004). Here, we describe a novel RSN based on the delayed connectivity between the stomach and brain regions sustaining body representations.

Presenter

Ignacio Rebollo, Cognitive Neuroscience Lab Ecole Normale Superieure