Symposium 23: Genetic approaches to psychobiological stress research in humans

Time: Saturday, 09/Sep/2017: 2:30 pm–4:00 pm
Session Chair: Stefan Wüst, Robert Kumsta

Heritability of hair cortisol and genetic overlap with psychological variables

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Background: Measuring cortisol in hair is a promising method to assess alterations of the biological stress-response which is altered in psychiatric disorders. While first studies indicate a contribution of genetic factors to inter-individual variance in hair cortisol concentration (HCC), it is unknown whether genes influencing HCC also account for inter-individual differences in psychological variables. The existence of such a true biological link would point at a causal involvement of the HPA axis in the vulnerability for psychiatric disorders. The aim of the present study was (1) to assess the heritability of HCC (2) to estimate the genetic and environmental association of HCC and perceived stress, depressive symptoms and neuroticism using twin models and a molecular genetic approach, i.e. polygenic risk scores (PRS).

Method: Hair samples from 671 individuals (mean age = 14.5 years) including 183 dizygotic twin-pairs were analysed. PRS scores were based on large published genome-wide association studies and analyzed in 432 individuals.

Results: The twin model revealed (1) a heritability of HCC of 72%, but no phenotypic nor genetic overlap of HCC with psychological variables.

Conclusion: HCC is highly heritable, but shows no phenotypic/genetic correlation with any of the studied psychological variables in our individuals from the general population. Future studies need to explore possible correlations in clinical samples displaying more pronounced phenotypes.

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Examination of immediate gene–environment interplay by means of experience sampling

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Background: A gene–environment interaction (G×E) is observed when the effects of environmental influences are dependent on genetic background. The differential susceptibilty hypothesis suggests that individuals are not just more vulnerable than others to the negative effects of adversity, but also disproportionately susceptible to the beneficial effects of supportive and enriching experiences.

Methods: Here we tested this hypothesis on the micro-level by means of the Experience Sampling Method. 350 individuals were genotyped for a common polymorphism in the serotonin transporter gene promoter (5HTTLPR), and two oxytocin receptor gene (*OXTR*) single nucleotide polymorphism (rs53576 and rs2268498). Sampling periods consisted of four days with 4 assessments per