clear structural and functional effects of so-called stress inoculation paradigms in developing animals [5]. There is, however, still limited data available on the neural effects of interventions enhancing resilience or positive adaptation in healthy controls, patients or at risk populations.

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S.22.03 The impact of the early life environment on stress resilience in adulthood

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Throughout the millennia of human evolution most individuals will have been exposed to a variety of stressors throughout early life. Today multiple epigenetic and molecular adaptations triggered by exposure to early life stress (ELS) are known, with life-long consequences for the physiological and behavioral phenotype [1]. Since epidemiological studies have linked ELS with a higher risk to develop psychiatric disorders, it was assumed that the molecular alterations occurring as a consequence of ELS must be causal for the increased disease risk and therefore maladaptive. From an evolutionary perspective this seems odd, though, given that the stress-induced adaptations are highly conserved and very specific. An alternative view integrates the consequences of ELS in a more holistic framework that also takes into account the genetic predisposition and the environment encountered in adulthood [2]. We have tested this hypothesis by comparing the developmental effects of supportive or aversive early life conditions, followed by supportive or aversive adult environments. Our studies show that early life adversity severely affects the adult phenotype under non-stressed conditions, but may also increase resilience to challenging adult environments [3,4]. Specific endophenotypes, like hypothalamic-pituitary-adrenal axis activity, anxiety-related behavior and glucocorticoid receptor expression levels in the hippocampus were not significantly altered when adversity is experienced during early life and in adulthood, and are mainly affected by either early life or adult life adversity alone. Overall our data support the notion that being raised in a stressful environment prepares the offspring to better cope with a challenging adult environment.

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S.23 From the lab to the clinic: Chemogenetics as an innovative tool to develop new therapies for brain disease

S.23.04 Targeting the dopamine system with chemogenetics to treat psychiatric disease

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Hyperdopaminergic states in mental disorders (which include ADHD, Addiction and eating disorders) are associated with impulsivity, impaired attention, hyperactivity and deficits in decision-making. However, the precise contribution of topographically distinct mesencephalic dopamine projections to these processes remains elusive. Chemogenetics is a novel tool which revolutionizes neuroscience since it enables us to bring specific neuronal circuits under control of a drug that acts on a designed (usually G protein-coupled) receptor. We investigated the effects of chemogenetic activation of different populations of dopamine neurons in the ventral tegmental area (VTA) or substantia nigra pars compacta (SN) on performance of a variety of tasks that quantify behaviors related to psychiatric traits. The results suggest that enhanced midbrain dopamine neuronal activity underlies deficits in attentional performance, but is not sufficient to provoke impulsive actions (in the 5-CSRTT). Furthermore, our results suggest that impaired attention caused by VTA dopamine activation is tightly linked to behavioral activation, whilst SN dopamine activation disrupts attention and performance accuracy at a more cognitive level [1,2]. Activation of VTA neurons projecting to the

accumbens decreased performance on a reversal learning paradigm because rats did not learn from losses efficiently [3]. These findings support that chemogenetic targeting of VTA dopamine neurons is an innovative approach for the treatment of motivational deficits in psychiatric disorders. Chemogenetics has the potential to become a novel brain-directed treatment strategy for psychiatric disease such as major depression and anorexia nervosa.

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S.25 The 'golden hours' of personalised intervention in post-traumatic stress disorder

S.25.03 Best practice of secondary prevention in PTSD

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Despite considerable research, there remains no definitive way to prevent PTSD following a traumatic event although a number of psychological and pharmacological approaches hold some promise. The evidence continues to slowly increase but very early interventions remain evidence-informed rather than evidence-based.

The evidence against providing single-session, trauma-focused preventive psychological interventions for everyone involved has grown [1], remains at best neutral and may even cause harm in some people [2]. Multiple-session psychosocial interventions are more effective but only if targeted at individuals with symptoms rather than at everyone involved in a traumatic event [3].

A number of pharmacological approaches to prevent PTSD have been tried. Attempts to temper the initial adrenergic response associated with the development of PTSD with propranolol have not been successful and other pharmacological approaches, for example hydrocortisone and morphine in individuals with severe physical traumatization, hold more promise [4].

The opportunities for further research using both pharmacological and psychological and social approaches, not least in the consolidation and reconsolidation process, are significant and much needed. Until new evidence emerges, however, current best practice of secondary prevention in PTSD involves the delivery of supportive, practical and pragmatic input in a supportive and empathic manner, following the principles of psychological first aid, with avoidance of formal clinical interventions until symptoms emerge and do not spontaneously resolve [2].

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S.25.04 Guideline for terror, update on NATO guideline

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Overwhelming traumatic experience or sudden changes in social circumstances that become a reality due to terrorist threats in Europe continue to be the focus of the attention and undermine the public sense of safety. Terrorist attacks are associated with a high risk for the development of Terrorism Induced Stress (TIS) such as Posttraumatic Stress Disorder (PTSD). The burden of PTSD may be related to impairment of the individual's quality of life, work, family and social relations [1]. Being a long-lasting debilitating mental illness it is crucial to explore possibilities of prevention. As a large body of evidence demonstrates that memory consolidation takes place in the first few hours after exposure to a traumatic event, interventions in this window of opportunity are critical for the development of PTSD (the 'golden hours'). Hence, there is urgency to come with better, evidence-based, guidelines that harness our current neuroscientific understanding of the pathology of PTSD into the clinical practice of interventions in the 'golden hours', the so-called secondary prevention [2]. The presentation will focus on the following aspects:

1 What? What needs to be done in the immediate aftermath of terror (and what should be avoided)?

2 Who? Who is vulnerable and who is resilient? What is the neuroscientific evidence that justifies secondary prevention of vulnerable individuals?

3 When? When to intervene? Identification of therapeutic 'golden hours' and implementations of rational interventions for secondary prevention of terrorism-induced stress related disorders.

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