

NWO programma Brain and Cognition: an integrated approach

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Naam Projectleider: Benno Roozendaal

Titel: Glucocorticoid-endocannabinoid interactions in traumatic memory and posttraumatic stress disorder: a translational approach

1. Participanten

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2. Inhoudelijk verslag

The aim of this workshop was to explore the possibilities of submission of one or more joint grant proposals. As several of the participants did not know each other, the first day of the meeting consisted of a full-day symposium in which each of the participants gave a 30-min presentation of their work. The morning session consisted of 5 presentations discussing preclinical research in humans and animals on glucocorticoids, endocannabinoids and their interaction in influencing synaptic plasticity and memory. The afternoon session consisted of 5 presentations discussing glucocorticoids and endocannabinoid effects on cognition, immunity and anxiety disorders in clinical populations. Benno Roozendaal discussed the effects of glucocorticoids on brain mechanisms involved in learning and memory in experimental animals. Patrizia Campolongo discussed the effects of endocannabinoids on learning and memory in rats. Volker Korz presented his research on the effects of glucocorticoids and stress on electrophysiological models of synaptic plasticity and learning and memory in animals. Daniela Hauer presented mechanisms of endocannabinoid signaling in rats and humans and interactions between glucocorticoids and endocannabinoids in regulating memory and mood. Bernet Elzinga presented work on the role of glucocorticoids and the noradrenergic system on memory retrieval and reconsolidation in healthy human subjects. Dominique de Quervain presented data on the role of glucocorticoids on memory functions in human subjects and further on the influence of genetic polymorphisms of glucocorticoid and noradrenergic receptors on the formation of emotional memories. Joseph Briegel discussed work on the effects of extreme stress on glucocorticoid signaling in critically ill patients and Ines Kaufmann presented data on the role of endocannabinoids on the immune system and pain perception in critically ill patients. Finally, Gustav Schelling showed data on interactions between glucocorticoids and endocannabinoids on mood, cognition and anxiety disorders in critically ill patients and healthy humans exposed to extreme stressful situations.

The second day was used to discuss possibilities for the submission of a joint grant proposal. In the morning session we were joined by Peter Braun, a member of the international grants office of the University Medical Center Groningen. He explained the opportunities and difficulties of building an international consortium aimed at submitting

a large research grant for the KP7 Health program. All members agreed that the ultimate goal of this group of researchers should be to build such a consortium. A long discussion followed on what the main focus of this grant proposal should be. The final outcome of this discussion was that for such a large grant it would be critical to even more broaden the scope of the consortium. The following title was proposed: 'Stress effects on cognition in health and disease.' However, then it would be necessary to add some disciplines (e.g., psychiatry and epidemiology) to the consortium. Currently, we are working on contacting various researchers to see whether they could make a valuable addition to the consortium. In addition to such a KP7 grant proposal, we worked on possible ideas for other grant submissions as well. Some of the symposium participants (Roosendaal, de Quervain, Schelling, Kaufmann, Thiel, Briegel, Hauer) are members of a topical team of the European Space Agency. With these symposium participants we discussed possible collaborations/experimental designs and a grant proposal on the investigation of glucocorticoid-endocannabinoid interactions on cognition, immunity and anxiety during extreme stress exposure in space for an upcoming grant deadline by ILSRA-09-ESA. Finally, we discussed the possibility of submitting some smaller scale grants (e.g. Human Frontiers Science Foundation grant) and several new collaborations were suggested between individual participants of the symposium. In December 2009 there will be a follow-up meeting in Munich with 6 of the participants to discuss the next steps to form a balanced and successful consortium in the preparation of a KP7 grant.

3. Eindresultaten

As a result of this workshop, some members (Roosendaal, de Quervain, Schelling, Kaufmann, Thiel, Briegel, Hauer as well as others not participating in this symposium) have submitted a grant proposal to the International Research Announcement for Research in Space Life Sciences at the International Space Station (ILSRA-09-ESA) (September 2009) entitled 'Consequences of stress challenges on stress response systems and immunity in space: a multidisciplinary approach.' A copy of the submitted application is enclosed. Some of the experiments proposed in this application are a direct product of this symposium and are aimed at investigating interactions between glucocorticoids and endocannabinoids on cognition, mood and immunity during extreme stress exposure in space flight and simulated space flight. However, the main goal of this workshop was to form a consortium that will submit a large grant proposal to the KP7 Health program. As no appropriate topic could be found on the 2009/2010 call, no KP7 grant proposal has been submitted yet. Strategies are being developed on how to bring our topic of 'Stress effects on cognition in health and disease' on the agenda of a future call of this program. In the mean time, additional research groups are being added to the consortium (Oldehinkel, University Medical Center Groningen). A grant proposal to the Human Frontiers Science Foundation (Roosendaal, de Quervain; April 2010) is in preparation.