There are several impressions that immediately come to mind when the term mental disorder pops up in a conversation. “He’s lost it”, “She’s gone mad”, “There is a screw loose up there” - all carry a derogatory connotation and refer to a noticeable change in behavior loosely bundled together into mental disorders. There is the issue of stigma from films, books, or simply the eccentricity of behavior. There is also the extreme case of physical violence and the personal safety of others, which then gets highlighted in the media and has the danger of inappropriately painting the entire community with one broad brush-stroke. There is the issue of where we draw the line, is it eccentricity or is it a mental disorder? The lines blur when it comes to degrees of charisma.

What is really ‘normal’? Foucault and other postmodern thinkers write about this extensively. And in a cosmopolitan city like in Berlin, where the cultural heritage spans from all across the globe, how do you define cultural differences and segregate this concept from normalcy or convention? Clearly, the definition of mental illness quickly becomes complicated. Nevertheless, we attempted to write about some of the complexities from varying angles. This issue is not meant to be a position statement, nor will it ever do justice to a very complex and intricate theme. However, with the heightened awareness due to recent multinational reports on this topic (see our lead story: 38% of Europeans are affected by mental disorders) and the ongoing research in the neuroscience community, we wish to highlight some of the angles.

We also ask the community to send in their opinions and feedback, with conferred anonymity upon request.

Before letting you explore our new issue, let me please highlight that Veronika Lang has joined our editorial team.

- Gina

**Schöne Grüße an Alle!**

We would like to congratulate Caroline Szymanski and Ha Thi Hoang for winning awards for their Master thesis that they have completed in the Medical Neurosciences program.

Caroline won the Katharina-Heinroth-Preis 2012 for her Master thesis entitled “Changes in effective connectivity upon consciousness - An intracerebral study in humans”. The Katharina-Heinroth-Preis is awarded annually for excellent Bachelor, Master, and Diploma theses by the Gesellschaft Naturforschender Freunde zu Berlin (http://www.gnf.de/). Next deadline for application: November 15, 2012.

Ha Thi Hoang was awarded the Humboldt-Preis 2011 for his Master thesis “Chromogranin B Levels are increased at lesions in Experimental Autoimmune Encephalomyelitis”. The Humboldt-Preis annually rewards outstanding Bachelor, Master, Diploma, and PhD theses (http://www.hu-berlin.de/pr/medien/informationen/auszeichnungen/humboldtpreis).

**Cover Page:**
The drawing on the cover page, inspired by Pablo Picasso, was created during art therapy at the Clinic for Psychiatry and Psychotherapy, Charité Medical University, Berlin (artist: anonymous).
Mental and Neurological Disorders Come to the Forefront: Significant Health Burden on Society

Arguably, one of the most profound findings of 2011 was an epidemiological report on the mental health status of the European Union. Hans-Ulrich Wittchen and his international team of mental health experts have unraveled striking data on just how extensively disorders of the brain impact European society, and if the trend has been changing over the last three decades.

With an initial goal to systematically assess the prevalence and burden of neurological and mental disorders in the European Union, experts from each disease category met and combined their data, only to find that it was difficult to segregate prevalence between mental and neurological disorders, due to significant overlap. However, it was possible to assess the burden of mental and neurological disease separately, when expressed as disability adjusted life years. Previous knowledge on this subject has been sparse – the World Health Organization reported an estimated 19% of global health burden to be from mental disorders. The World Mental Health Survey quotes that one in three adults suffers from a mental disorder.

Wittchen and colleagues set out to sample all of the EU countries as well as Norway, Iceland, and Switzerland. The team combined retrospective studies, consistent reanalyses of existing epidemiological datasets and supplementary survey data from national experts to gather the best possible comprehensive dataset. 19 epidemiological panels were dispatched and at least one international expert was recruited per diagnostic group. Data was collected as far back as 1980, when the first diagnostic criteria were published on an international level (Diagnostic and Statistical Manual of Mental Disorders (DSM) and International Statistical Classification of Diseases and Related Health Problems (ICD)).

The results were startling: 38% of all Europeans are affected by disorders of the brain. Combined, mental and neurological diseases comprise Europe’s largest disease burden, in terms of disability adjusted life years. The highest proportion of this burden was due to anxiety disorder, unipolar depression and insomnia.

Previously, Wittchen and colleagues had published a similar report in 2005, where the numbers were significantly more conservative, citing that 27% of the EU population are affected by mental disorder. However, this study produced a much more restrictive estimate due to age restrictions of the sample (only adults and not kids nor elderly were included), and a much more limited set of criteria for mental disorders. This time around, the team decided to get an unrestricted estimate regardless of age range or disease type.

Drug-Induced Mental Disorders: A Common Reason for Concern?

By Anne Schwerk, PhD Student, AG Neuronal Regeneration and Plasticity

Most psychoactive drugs alter our cognitive and emotional states, but does chronic use implicate a pathological change in our mental condition? If we chronically alter transmitter pathways, adaptations will certainly take place. Adaptations are expressed during addiction as sensitization and desensitization of transmitter pathways. This leads to an up- or downregulation of receptors and transporters and eventually to tolerance as well as craving when the drug is withdrawn. These adaptations originate out of natural compensation, but leave former drug users with an imbalanced brain chemistry and an increased risk for several mental disorders. Patients with substance disorders are twice as likely to suffer from mood and anxiety disorders (National Institute on Drug Abuse). Basically, all drugs alter dopaminergic regulation and consequently, our motivation and ability to experience pleasure is changed. Several drugs also cause neurotoxicity and can therefore easily lead to permanent damage, e.g. depression after prolonged ecstasy use due to serotonergic cell death. Apart from emotional disturbances, the most common drug-induced illness is psychosis; with alcohol (18%), cannabis (13%) and cocaine (18%) being the most common inducers [1]. One could blame everything on ‘high risk drugs’, yet, for many mental disorders susceptibility genes have been found, e.g. the VAL/VAL variant of the COMT-gene in cannabis users who go on to develop schizophrenia [2]. Other factors, such as food intake, can severely affect mental outcome after chronic drug use, for example vitamin b12 deficiency in alcoholics, which can lead to several mental disorders, including psychosis and depression.

Hence, aside from chronic substance use, our environmental and genetic conditions play a decisive role in the development of long lasting drug-induced mental pathologies. 

References:
• Wittchen et al., Eur. Neuropsychopharmacol, 2011
• Wittchen and Jacobi, Eur. Neuropsychopharmacol, 2005

References:
Navigating Mental Health Disorders

**Anxiety Disorders**

**Symptoms:**
- Excessive worrying about events or activities lasting at least 6 months with difficulty controlling the worrying
- Restlessness or feelings of being on edge
- Fatigue
- Difficulty concentrating
- Irritability
- Sleep disturbances
- Autonomic hyperactivity

**Prevalence:**
- Most prevalent mental health disorder
- Approx. 14% of EU population affected
- Approx. 61.5 million EU citizens currently affected
- Females affected two and a half times more frequently compared to males

**Brain Areas Involved:**
- Elevated medial prefrontal cortex activity
- Heightened amygdala responsiveness
- Anterior cingulate cortex

**Treatment:**
- Antidepressants
- Cognitive Behavioural Treatment
- Exposure therapy

**Major Depression**

**Symptoms:**
- Sadness or low mood
- Loss of interest or pleasure
- Fatigue or low energy
- Disturbed sleep
- Feelings of guilt
- Increase in physical health complaints

**Prevalence:**
- Second most prevalent mental health disorder
- Approx. 6.9% of EU population affected
- Approx. 30.3 million EU citizens currently affected
- Females affected twice as frequently as males

**Brain Areas Involved:**
- Hyperactive ventromedial prefrontal cortex
- Hypoactive dorsolateral prefrontal cortex
- Increased activity of subgenual cingulate cortex
- Increased activity in amygdala

**Treatment:**
- Antidepressants: SSRIs
- Psychotherapy
- Electroconvulsive Therapy
- Transcranial Magnetic Stimulation (TMS)
- Deep Brain Stimulation
- Light Therapy
**Somatoform Disorders**

**Symptoms:**
- Somatic symptoms that cannot be explained by a medical condition
- Multiple and chronic complaints of unexplained physical symptoms including:
  - Pain
  - Gastrointestinal symptoms
  - Sexual complaints
  - Pseudoneurological symptoms

**Prevalence:**
- Ranked as third most prevalent mental health disorder
- Approx. 4.9% of EU population affected
- Approx. 20.4 million EU citizens currently affected between ages of 18-65
- Females affected twice as frequently as males

**Brain Areas Involved:**
- Concrete neural correlates remain largely unknown for most somatoform disorders
- Dysfunctional pain processing in somatoform pain disorder involving increased activation of anterior cingulated cortex and insula
- Hyper-reactivity of amygdala
- Abnormalities in caudate nuclei

**Treatment:**
- Psychiatric consultation with primary care provider
- Cognitive Behavioural Therapy

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**Schizophrenia**

**Positive Symptoms:**
- Hallucinations
- Delusions
- Ego-disturbances

**Negative Symptoms:**
- Blunted affect
- Reduced drive
- Social withdrawal

**Prevalence:**
- Affects approx. 1.0% of normal population; however, the prevalence is much higher when there is a family history of the disorder
- Affects females and males equally

**Brain Areas Involved:**
- Enlarged ventricles
- Grey and white matter reductions in several brain regions

**Treatment:**
- Antipsychotics
- Psychotherapy:
  - Social skills training
  - Cognitive remediation
  - Psychoeducation
Epigenetics: Regulating New Outlooks on the Correlates of Addiction

Epigenetics, derived from the Greek word *epi* meaning ‘upon’ and genetics, provides a mechanism through which the environment can exert an effect on the genome without altering the actual sequence composition of the DNA itself. This is a regulating mechanism that determines whether or not transcription factors have access to the DNA for gene expression. The underlying molecular processes involved in these epigenetic marks can be seen at two different levels of regulation. The first is the more classical epigenetic mark occurring on the DNA itself whereby methyl groups are added to the cytosines resulting in gene repression. The second occurs at the level of the chromatin on key components known as histones. Modification of these allows a much more extensive array of possibilities, including but not limited to the most widely studied marks: acetylation and methylation, each of which is associated with varying degrees of gene activation or repression. This complex regulation, especially at the level of the chromatin, illustrates how epigenomic marks carry an additional layer of information particularly relating to environmental influences, expanding upon the information our genome carries through the classically known principles of Mendelian inheritance. Understanding these epigenetic marks may provide a new regulated mechanism for how researchers view the correlates of mental health disorders and evidence from addiction research is beginning to converge upon this evolving idea.

**Epigenomic marks carry an additional layer of information**

The nucleus accumbens (NAc), a key region involved in the neural reward circuitry has long been known to show changes in gene expression during administration of addictive drugs. Research into the mechanisms through which this alteration occurs has now elucidated the role of chromatin remodelling at specific gene promoters. Hyperacetylation of the histones, an epigenetic mark of transcriptionally active genes, has been found at a number of gene promoters including cFos, FosB, BDNF and Cdk5, all of which are well understood to be highly regulated by acute and chronic cocaine administration [1]. Induction of increased FosB gene expression resulted in increases in its splice variant DeltaFosB, which has been well documented to increase in the striatum during drug exposure. DeltaFosB accumulation has also been linked to cocaine’s rewarding and addictive properties. Insight into the mechanism of transitioning from recreational drug use to addiction has identified that when acetylation of the FosB gene is prevented, less FosB expression and, more importantly, DeltaFosB was found after chronic cocaine administration [2]. This decreased expression as a result of acetylation inhibition translated into a reduction in sensitivity to cocaine administration measured through locomotor activity.

More recent evidence from within the NAC has also shown that repeated cocaine administration produced increased levels of histone dimethylation, an indication that cocaine can also act as a repressor of gene expression [3,4]. Interestingly, there was very little overlap between genes that were acetylation inhibition translated into a reduction in sensitivity to cocaine administration.

Correlation that exists between methylation and behaviour is believed to be due to its effects upon learning and memory processes implicated in addiction [5]; however, much remains to be elucidated. This suggests that a multitude of epigenetic marks coexist as an underlying mechanism that mediates the long-term effects of addictive drugs. These dynamic patterns of chromatin remodelling fit well with the idea of the ‘histone code’, emphasizing that many modifications act in concert to ultimately affect downstream signaling cascades.

Altering the enzymatic machinery that is responsible for these chemical modifications has become a driving force in the pursuit of addiction therapy. Pharmacological manipulations of histone deacetylases (HDAC), the enzymes responsible for removal of acetyl groups, have illustrated that HDAC inhibition results not only in elevations in gene expression of factors such as FosB, but more functionally in potentiated effects of cocaine reward [3,6]. Conditioned place preference, a measure of the rewarding effects of cocaine, was significantly higher when HDAC inhibitors such as sodium butyrate or trichostatin A were injected [1,3]. Conversely and more therapeutically relevant to abolishing addictive behaviour, reducing acetylation of these genes through inhibiting histone acetyl transferases (HATs) or overexpressing HDAC has proved to be an effective mechanism for decreasing behavioural sensitivity to cocaine [1,2]. This evidence illuminates the mediating effects of HATs on addiction and that alteration of these enzymes may prove to be an effective therapeutic strategy. Overall, understanding this epigenetic regulation yields a new outlook on therapeutic targets in the hope that preventing or reversing these changes will result in amendment of addictive behaviour.

While epigenetics provides a viable mechanism and target for future therapy in addiction, one should still keep in mind that the easiest way to ease addictive behaviour is to abstain from drug indulgence from the start! (JF)

**References:**

[1] Kumar et al., Neuron, 2005
[2] Levine et al., PNAS, 2005

**Further Reading:**

Tsvankova et al., Nat Rev Neurosci, 2007
For this CNS issue, we decided to feature an article to distinguish between ‘depression’ and ‘burnout’. Luckily, just a few days after our editorial meeting, ‘burnout’ made it as the headline of my favorite weekly newspaper. Perfect timing! Within the following weeks, I was able to accumulate quite a number of popular magazine articles dealing with depression and/or burnout. But why is that? Why is depression and burnout such a hot topic nowadays? And what exactly does the expression burnout mean? Is it a newly appearing epidemic? A buzz word? Some kind of euphemism for depression?

At any rate, burnout is not a brand new expression. The New Yorker psychoanalyst Herbert Freudenberger introduced it back in 1974 to describe the condition of many workers employed in helping and social professions. They attracted attention because of frequently suffering from exhaustion, headaches, digestion problems and aggression due to overwork.

The diagnosis ‘burnout’ does not actually exist

Nowadays, these observed conditions are no longer restricted to professions with strong interpersonal interactions and emotional burden; the burned-out celebrities appear from every direction. Politicians, soccer player, cooks, authors, you name it. These are the prominent representatives of the third of Europeans who are currently affected. Despite its omnipresence, the diagnosis ‘burnout’ does not actually exist. Not even a clear and universal definition can be found. Within the WHO’s International Statistical Classification of Diseases and Related Health Problem (ICD-10), burnout-syndrome is listed as factor Z73.0 in the category of ‘problems related to life management difficulty’ leading to use of the health system. Therefore, burnout is not a recognized somatic or psychiatric disease. It can rather be understood as a physiological or psychiatric disease. Therefore, burnout is not a recognized somatic or psychiatric disease. 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It can rather be understood as a physiological or psychiatric disease. Therefore, burnout is not a recognized somatic or psychiatric disease. It can rather be understood as a physiological or psychiatric disease. Therefore, burnout is not a recognized somatic or psychiatric disease. It can rather be understood as a physiological or psychiatric disease. Therefore, burnout is not a recognized somatic or psychiatric disease. It can rather be understood as a physical, emotional and cognitive reaction to a long lasting stressor at the work place, which is expressed as the core symptom of lasting exhaustion. Furthermore, alienation and cynicism towards work are typical symptoms. It is mainly due to the cardinal symptom – several months of long-lasting exhaustion – that burnout often gets mixed up with the psychiatric disease depression. Although exhaustion is also frequent, it is not demanded for a diagnosis of depression.

According to ICD-10 criteria, major depression is diagnosed if at least two of the main symptoms, i.e. depressed mood, inability to experience pleasure OR loss of drive and energy are present for a minimum of two weeks, accompanied with at least two additional common symptoms, such as decreased self-esteem, suicidal thoughts, cognitive impairments, sleep disorders or loss of appetite.

A distinction can be made simply by asking the patient what they would like to do if they had more energy. A burnout patient would likely answer with a whole string of ideas, whereas a depressed patient will listlessly shrug their shoulders.

Why and when somebody ‘burns out’ is an interplay between personal traits and the ‘toxicity of the working place’ [1]. Does one tend to ‘over-commit’ oneself to work, or have problems with asking for help or with passing on work due to the fear of losing control? Does the work demand high responsibility or long working hours? Is the available reward too low in the sense of wages, appreciation or career opportunities? When the discrepancies between our own ideas and professional demands grow, so too does inner tension. Additionally, if one has few coping strategies, an insufficient social network and an inability to switch off, the risk of emotional exhaustion becomes quite high. Such job-related burnout-associated symptoms can be recorded and rated with the Maslach Burn-out Inventory (MBI), a questionnaire inquiring about exhaustion, alienation, cynicism and reduced work performance.

Still, why is burnout widely talked about today? The psychiatrist Markus Pawelzik justifiably wonders: Did our professional life become more burdening? Did we become less loadable? Or is the label ‘burnout’ a role model we would like to be identified with [2]?

Surely, our present time is characterized by high pressure to perform, high pressure from competition, high risk of unemployment, insecurities regarding old-age provision, blurring of the boundaries of work and working hours, dissolving family structures. We strive for globalization, transience, speed and perfection, constant availability and maximum flexibility. Mankind has never had more freedom of choice or more freedom of decision. However, this gain of freedom comes together with an increase in personal responsibility, also in case of failure. All these aspects might contribute to a tendency in our present generation to ignore the first signs of fatigue and imbalance.

For people experiencing long-lasting exhaustion, Pawelzik assumes burnout to be a much more welcomed label than depression. As opposed to the latter, it is not stigmatized and may even be morally relieving, as whoever ‘burns out’ had to be forewarned beforehand [2]. According to Isabella Heuser, director of the Charité Clinic for Psychiatry and Psychotherapy, this is why people, but especially men, can accept burnout way easier than depression [3]. She emphasizes that this circumstance accounts for the risk of disguising real depressions and thereby impedes the application of appropriate anti-depressive therapy. The inflationary use of the term burnout once had the beneficial effect of promoting communication about mental diseases. Now, it complicates the appropriate handling, as therapeutic approaches differ massively between depression and burnout. While time-out might be beneficial for a burnout, depressive episodes often worsen during vacation. The broad therapeutic spectrum for burnout includes a guided improvement of self-management, psycho-education, psychotherapy, increasing balance through physical activity, relaxation exercises, and social and non-work-related activities. As burnout patients clearly need a therapy with such content, one would never prescribe anti-depressive drugs as for the metabolic disease depression.

“The best way towards an optimal treatment of the disease depression is to call a depression a depression” recommends the psychiatrist Professor Ulrich Hegelri [4].

References:

AM I SICK?

Depression vs. Burnout
Not Guilty by Reason of Insanity
A Short Essay About the Correlation of Mental Illness and Crime

July 22, 2011, 3:22 pm (CEST) – a car bomb explosion in Oslo killed eight people and eleven others were critically injured. Less than two hours later, 69 people were killed and 66 injured at a summer camp on the island of Utøya in Tyrifjorden, Buskerud. The same evening, the assassin was caught by the police. November 29, 2011 – The psychological examination of the assassin went public. Diagnosed with paranoid schizophrenia, he was considered not to be responsible for his crime because he was suffering from psychosis at the time of the massacre. Hard to swallow for the public, this initiated a debate about whether a person who killed 77 innocent people should not be responsible for his crime because of a mental illness.

In fact, most people would consider a person with schizophrenia, alcoholism or drug addiction as dangerous to others and unpredictable [1]. The truth is that only one in twenty violent crimes is committed by a person with severe mental illness, as was shown in a study of the Swedish population between 1988 and 2000 with Sweden having high-quality national registers for hospital admissions and criminal convictions [2]. Most of the crimes are still committed for socio-demographic or socio-economic reasons [3]. Despite this, the debate of whether mentally ill people are more violent or dangerous than the general population is still ongoing. Some studies suggest an increased risk of up to 3-fold [4] whereas others do not find this correlation [3]. However, they all agree that substance abusers are more violent and add a large percentage of crimes to community violence. This seems to be independent of whether the person has another concurrent mental illness or not [3]. Conversely, another study found that the risk of violence is rather related to symptoms of the psychiatric illnesses and that patients who have been treated and who do not show any symptoms of the illness any longer are not more likely to be violent than people without a psychiatric illness [5]. These issues are further complicated as social isolation can itself lead to the development of psychiatric diseases [6]. People who are excluded from society may wish to draw the attention of others to themselves despite the risk that this might be their last action, which is the case in gun rampages. Therefore, psychiatrists recommend integrating mentally ill persons into the society. Behavioural therapy is often needed to complement drug treatment [7].

There are a lot of reasons why there is still an extensive stigmatization of people suffering from mental illnesses, despite the fact that every third European is affected by disorders of the brain [8] and every second person claims to know somebody with a mental illness [1]. Besides general ignorance and fear of the unknown, one of the major factors is probably how people suffering from psychiatric disorders are presented in the media. Up to 80% of newspaper articles about people suffering from psychiatric disorders report that these people are violent [9]. Thereby, prejudices and stereotypes develop, shaping our minds and making the social taboos associated with mental illness even harder to overcome.

“Mental disorders are neither necessary nor sufficient causes of violence” [3]. It is social circumstances that better determine whether violence occurs or not. Research should be directed towards early diagnosis and improvement of treatment, since mentally ill people undergoing treatment are no longer likely to commit a violent act. (mz)

References:
[5] Steadman et al., Arch Gen Psychiatry, 1998
[7] Feng et al., Worldviews Evid Based Nurs, 2012

Further Reading:
http://www.neuro24.de/vorurt.htm (in German only)

“For there is nothing either good or bad, but thinking makes it so.” - The Tragedy of Hamlet, William Shakespeare
Are You Crazy, When Is It Too Much?

If we think about the multitude of ways individuals perceive reality, have feelings, think and relate to others, it might become hard to set a threshold for normality [1]. Based on these perceptions, together with a genetic background, each individual expresses unique emotional and behavioral patterns and attitudes, the so-called personality [2]. But what determines whether a personality is socially acceptable or not? Is it black and white or is there a ‘grey zone’?

Personality disorders are an enduring pattern of experiences and behaviors that are deviant from what is accepted as the norm in our society. Is a personality disorder a disturbance of behavior or is an aberrant behavior created by a disturbance of personality? Personality disorders could perhaps be more accurately described as ‘maladaptive variants of common personality traits’ [3]. However, the definitions remain subject of discussion, as their diagnosis is based on society values and one should be able to distinguish a disorder from normal personality traits, personality disorders from other mental disorders, and the various personality disorders from each other.

When looking at the International Classification of Diseases (ICD-10) provided by the World Health Organization, we can probably all name someone for whom the definitions fit perfectly: let’s start with paranoid disorder. A paranoid personality type is defined by “excessive sensitivity to setbacks, unforgiveness of insults; suspiciousness and a tendency to distort experience by misconstruing the neutral or friendly actions of others as hostile or contemptuous; recurrent suspicions, without justification, regarding the sexual fidelity of the spouse or sexual partner; and a combative and tenacious sense of personal rights. There may be excessive self-importance, and there is often excessive self-reference”. Schizoid personalities are characterized by “withdrawal from affectional, social and other contacts with preference for fantasy, solitary activities, and introspection. There is a limited capacity to express feelings and to experience pleasure”. Dependent personality disorder is characterized by “persistent passive reliance on other people to make one’s major and minor life decisions, great fear of abandonment, feelings of helplessness and incompetence, passive compliance with the wishes of elders and others, and a weak response to the demands of daily life. Lack of vigour may show itself in the intellectual or emotional spheres; there is often a tendency to transfer responsibility to others”. Other types of personality disorders are the dissociative, emotionally unstable, histrionic, anankastic and anxious (avoidant) personality disorders [4].

In the ICD-10 classification, personality disorders do not necessarily imply an ongoing pathological process in the brain, nor are they the symptoms of other psychiatric disorders, although a personality disorder is co-diagnosed in 40 to 60% of patients suffering from other psychiatric conditions. Because disturbances of the personality directly affect the main facet of an individual mediating interaction of the ego with the external world, people with a personality disorder often suffer from major distress. These conditions can lead to maladaptation, exclusion, and most often depression if a sufferer feels they do not meet the expectations of the society. Most disorders are reflected in various components of one’s personality and tend to be traced back to childhood, prevailing throughout adolescence and adulthood.

Some argue that personality disorders are similar pathological conditions as depression or anxiety, where the border between normality and abnormality is not clear-cut, although clear diagnosis is possible [5]. Nonetheless, personality disorders have some fixed patterns that differ from normal personality traits: they can be traced from an early period of the individual’s life, they are maintained over time and cross a broad range of situations, and they are not induced by an event in one’s life. A final characteristic of personality disorders is that the patterns of behavior expressed are experienced by the individual as normal, often causing distress as well as disparity between the self and the others.

Personality disorders might be as debilitating as other psychiatric conditions; they are inflexible and pervasive, causing social and occupational dysfunctionality in an individual’s daily life. However, they are not mere episodes of insanity belonging to a ‘grey zone’ but require different approaches of understanding.

Time for Some Virtual ‘Rat’atouille!

Virtual Rat to Cure Human Diseases

Virtual models of rats will help researchers to gain new insight on human diseases like high blood pressure and heart failure. Daniel Beard and his colleagues at the University of Wisconsin aim to study how multiple genes and environmental conditions, as well as their interactions can lead to the development of a disease. The starting point of this project is the modelling of a healthy rat’s cardiovascular system to make predictions about potential diseases. The accuracy of the data will then be verified on living rats. Once a healthy rat has been successfully tested, the model will be extended to rats with high-blood pressure and other cardiovascular diseases, as well as new genetic strains with interesting cardiovascular phenotypes. Thus, the researchers want to recommend early interventions to stop heart diseases that can then be confirmed or falsified in living rats. As the models will closely reflect the rat physiology, they will help researchers to analyze data from animal experiments better and to develop more precise hypotheses.

In this issue, we would like to introduce Prof. Dr. Britta Eickholt, a NeuroCure Professor for Cellular and Molecular Neurobiology and faculty member of the Medical Neurosciences Program. In 2011, after 17 years of research in London, Britta decided to come back to Germany. Her research seeks to analyze the signaling mechanisms controlling the dynamic reorganization of the cytoskeleton within the growth cone and at the synapse using a wide range of in vitro and in vivo model systems.

MZ: Dear Britta, thank you for taking some time to talk about yourself and your career. First of all, what is your scientific background?

BE: I started my degree in Biology in Düsseldorf, but went to Tübingen after one year. Tübingen had (and still has) quite a few Max Planck Institutes, one of them being the Max Planck Institute for Developmental Biology. I had the chance to work as a student assistant in developmental neurobiology with Elisabeth Pollerberg, which led to my diploma thesis. I learned all about the development of the retinotectal projection and it was fascinating. Today, my interest centers on the molecular and cellular mechanisms that control neuronal circuit formation, and we apply our molecular and cellular tools in vivo in order to make our findings relevant at the physiological level.

And how did you come across neuroscience? During my time at the Max Planck Institute, I attended a lot of neuroscience courses and developed an interest in the subject. After my diploma thesis in 1994, I was not sure about doing a PhD. Not that my time at the Max Planck Institute wasn’t enjoyable, but it felt like the right moment to explore something else. My supervisor initiated contact with Prof. Andrew Lumsden who was visiting the Max Planck Institute at that time. He is a developmental biologist working in London who (re-) discovered the rhombomere patterning of the developing hindbrain. This whole topic was fascinating! I worked for three months with Andrew Lumsden and then started my PhD on signaling mechanisms in axonal growth with Prof. Patrick Doherty at King’s College. I stayed in London for 17 years.

Why London, why did you stay there for 17 years? There was never really a reason to leave London. Once, I wanted to go to the US (about two years after finishing my PhD), but then King’s College offered me a lectureship. This enabled me to establish my own research group and to start teaching as well. The position of a lecturer is one of the major differences between the British and German academic systems. In Germany, the number of mid-level faculty positions not requiring habilitation is very limited. I think that the British system is tough, but it does give you the opportunity to explore your research ideas and projects. You probably have greater independence earlier on in your career. You can have a secure position AND try out your ideas. As I said, shortly after completing my PhD I got a permanent position as a lecturer. I didn’t have to worry about job security and I was on my own. And, if you are successful in this kind of position, you can apply for grants and hire people. I am not saying that the British system is ideal, it is highly competitive and can be very tough, but I was independent quite early on.

Another option in Britain would have been to apply for the career development scheme that provides stipends for about 4 to 5 years; you just have to find the research environment you would like to work in. The institution has to give you space for your research, but you come with your own funding and have the chance to establish yourself. The disadvantage of this scheme is that you won’t have a job when these 4 to 5 years are over.

Why neuroscience and not biochemistry? I finished my undergraduate studies in 1994 when the basic mechanisms of neuroscience became apparent and the field opened up into molecular and cellular research; the study of interactions, pathways and receptors. The major receptors in axon guidance were identified, and lots of other discoveries were made at that time. The neuron is a very special, complex cell that is highly spatially regulated. To understand this is my motivation.

And what are your main topics of interest in neuroscience?

We are interested in signaling mechanisms that are activated, for example, in response to axon guidance molecules. How do they contribute to the development of the nervous system? How are synaptic contacts established and maintained? These basic questions lead us to other topics. There are many diseases in which the signaling and the control of cytoskeleton are affected, for example, neurodegenerative conditions and neurodevelopmental disorders.

You do a lot of basic research, why did you come to Berlin then when London was perfect for you and why did you join NeuroCure?

My situation here is very similar. In London, I was in the MRC Center for Developmental Neurobiology and had teaching obligations. Here, I am a part of the NeuroCure Excellence Cluster and will be teaching biochemistry at the Charité. Teaching in German will be a challenge for me. I studied Biochemistry in German, of course, but the rest of my career has been in English. I didn’t know much about NeuroCure itself before I saw the advertisement for my current position. It sounded really interesting so I applied and was invited to interview, which was amazing. The concept of NeuroCure focuses on translating basic research into clinical application. In London, I was more involved in investigating how the nervous system is put together, looking at the early aspects of patterning, finding the right way to make a synapse, etc. The change makes sense in relation to my previous work but I also have to learn new things. I also look forward to establishing new contacts with researchers here.

What impressed or astonished you most during your career?
Online Anatomy Class

By Nikolas Karalis, MSc Student Medical Neurosciences

Starting in 2012, Stanford University will offer some of the school’s most popular classes for free online, using an experimental online education system. This new project is aimed at a global audience and provides open access to a high-quality education. Among other classes, clinical anatomy will be taught by Dr. Sakti Srivastava, Division Chief of Clinical Anatomy. This course will cover the region of the upper limb (other body regions will be covered in subsequent courses) and it will make extensive use of interactive multimedia resources (e.g., a virtual dissection table). Students are expected to read the course material, complete assignments and take quizzes as well as an exam. The course can be completed in a self-paced manner.

Classes start on March 5th and you can enroll online at the website of the class. For a full list of the online classes offered please refer to www.anatomy-class.org.

Sometimes - this might sound odd - the best thing is when an experiment actually works (laughter), when your hypothesis turns out to be true. I like the moment when you find out you were right and can now prove it. Sometimes, even in a beautiful way and ideally using different methods. Everybody knows how difficult this is. It’s not that I don’t believe in my hypotheses, but it is always good when everybody’s hard work comes together, when everyone’s expertise and patience pays off.

What will be the big milestones in neuroscience research in the future?

A big milestone will be when our basic research results in better therapies for different diseases. There are diseases that are difficult for us to tackle - especially neurological disorders, for example, have proven to be very resistant to the approaches taken by pharmaceutical industry so far. Society grants us space and time for intensifying our research into unraveling underlying causes. We should take the increasing demand seriously to translate our findings more immediately and, I really believe, society will benefit from it. This is one of the reasons I find NeuroCure exciting. We’re on the edge of realizing a lot of important applications of basic research could become success stories in providing new avenues for treatments.

What other passions do you follow besides neuroscience?

I’ve played the violin and viola since I was a child. In London, I played in a band called Beskydy (check it out: http://www.beskydy.net) - playing Eastern European music. There are so many good musicians from Eastern Europe in Berlin, so it would seem odd for me to do this here. Now, I would like to play in a classical quartet or in other chamber music ensembles. I’ve started playing in a trio (with Christoph Harms), but if there are any other musicians out there... I’d be open to playing with them, too.

What would your message be to aspiring neuroscience students today?

Trust your instincts and follow your ideas. It’s difficult to make the jump from dependence to independence, from being told what to do to deciding on one’s own actions. In the driving seat of your own project you have to deal with the results, to decide whether your findings are real, to ask: is it interesting? In this position, you have to consider the big picture and not just the small entity that is part of your studies. When it comes to choosing where to do a PhD or to deciding on the next step in your academic career, you need to choose the environment you want to work in very carefully, to think about whether it is supportive and responsive and if you can develop in that particular environment.

What do you consider as your greatest achievements so far?

One of our achievements was the realization that major signaling pathways involved in tumour formation and growth are important also in controlling nervous system development. We have been, for example, working specifically on the function of the tumour suppressor PTEN in the nervous system for almost 10 years now. Taking a step back from the way this question focuses on just me, I think it’s great when a study works out. That really makes me feel proud. But one of the best things is when you realize the results are not only your own achievements. I’m happy when I have a great team. Part of my achievement is that I managed to get good people to work with me. You have to form a good team that likes to work together and that has fun.

Who are the researchers (dead or alive) to whom you look up to as role models?

I always admire colleagues with integrity and determination, who are interested, persuasive, creative, and show initiative. I have many colleagues that I admire because they pay continuous attention to detail, not only in the lab but also in the review process of papers and grants.

Thank you very much, Britta. (mz)
Charité International Cooperation Office

An Interview with Pamela Glowacki Who Manages the Charité Welcome Center

Just landed in Berlin? New to Charité as an international researcher? You certainly must have several questions then, and are probably confused where to get all the information under one roof. Don’t worry, help is right round the corner. We interviewed Pamela Glowacki, who almost single-handedly manages the Charité Welcome Center (CWC) at the Charité International Cooperation office, specially formed to help you with most of the administrative and organizational affairs related to your stay in Berlin.

In an exclusive tête-à-tête with our former editorial team members Aditya Mungee and Katyayni Vinnakota, Ms. Glowacki answered some basic questions that we have as international students of the Charité.

AM & KV: Hello, Pamela. Thank you so much for taking out time for this interview. We really appreciate it.

PG: Thank you too, Aditya and Katyayni, for having me on your newsletter. I hope this interview can benefit as many researchers as possible.

We are sure it will. So tell us, what is the Charité International all about, and what services do they offer to the research community?

So, before I go on, let me clarify that Charité International is a different organization and deals only with patients. My work is connected to Charité International Cooperation, under which I take care of the Welcome Center office. I basically handle international researchers who come to Berlin after being invited through a specific program or as a scientist of the Charité. The core group mainly consists of scientific staff members, doctoral candidates and scholarship holders as well as a smidgen of people who combine clinical and research work and also guest co-operation partners of various research departments. My job, in combination with the help of these people is to assist them with official matters relating to their stay in Berlin. These include: immigration and visa applications, health insurance issues, work contracts, medical exams, local address registration, housing matters, and marriage and family concerns. Essentially all those things that are important at the beginning of their arrival and also during the entire period of their stay in Berlin. And we all know that not many people speak English in these offices (laughs) and that is a huge advantage I offer to these newly arrived international researchers, who are at the beginning culturally- and language-wise challenged. So, here I am, happy to centralize and delegate all these issues for people who come to me with their problems.

Okay, that’s a lot of work we must say and you do a marvelous job of it too, and from our own personal experiences, we can safely vouch that you are the right person to contact for these bureaucratic matters. Great going! But tell us, how is the funding scene at the Charité and what can they offer? Many people are unaware of the types of funding for research and clinical work.

Part of the problem is that the Charité or the Universities in general are broken up into 3 different groups. There is money for education (Lehre), money for clinics (Klinikumsvorsorge) and partly for research. My boss is the Dean and hence, my focus is on research and faculty funds at the Charité. Since I single-handedly manage all these affairs, my forte is not clinical funding. As far as researchers are concerned, they can apply for different funds, such as money for doctoral students to get through with their thesis and for projects of different departments which are extra-murally funded and which hire people on limited contracts at the Charité. As Masters students, one can apply for Studentische Hilfskraft (student aid) money and as Doctoral students one can apply for some limited scholarships. The situation is otherwise tight with some stipends offered by the DAAD or the Alexander von Humboldt Stiftung for PhD or Post-Doc studies, but the emphasis in the end is more on doctoral students who need the funding to finish their dissertation.

That is definitely important to know. This leads us to the next question regarding the visa problems faced by doctoral students as compared to a staff member. What are the exact problems that these candidates have and why is it so?

The main reason for this discrepancy is due to different immigration and labor laws in Germany. Doctoral studies are not considered as a course of study but further training. So the choice of being enrolled as a student after a Masters degree is entirely one’s own decision as it comes with certain privileges and rights. But the Charité does not permit you to sign a work contract if you are a student and if it is not mentioned in your passport that you are allowed to work since both of these are two different entities. This is true for PhD students while the Masters students get a regular student visa for studying, irrespective of their enrollment status. If one is not enrolled, then they are allowed to work. Essentially there are two different rights that one gets- if you have a student visa that allows you to work 90 full days or 180 half days outside the Charité, the Ausländerbehörde considers that in addition to your work at Charité and regard that you are allowed to work. They are only concerned that you have a student visa which gives you the privilege to stay in Germany for a year to look for a job after completing your degree. This is not the case with work contracts, wherein if you stay for 5 years in Germany on a work contract, you are subsequently entitled to apply for permanent residency in Germany, thereby avoiding all the visa prolongation hassles. The Ausländerbehörde has so far allowed both these arrangements, but are now discontinuing them due to differences in the rights. What I am trying to get done for doctoral candidates now, is to get an amendment to their residence permits as students so they can stay enrolled but are also able to work as a wissenschaftlicher mitarbeiter. The reason is so that they can finish their thesis even if their work contract runs out.

What about the new finger-printing rules for the visa application that started from September 1st of 2017? Will you continue helping the students like before, with the visa processing despite the newly introduced changes?

Whether or not you have to fingerprint depends on how you arrived in Ger
many and how long you have been here for. If you are here on a German scholarship like the one offered by the DAAD or a program student, then you don’t have to record your fingerprints. If you come from one of the so-called 41er Staaten (USA, Canada, New Zealand, Australia, Israel, South Korea or Japan), then no matter how long you have resided in Germany, you are entitled to get the sticker. If you are from somewhere else, been here for more than one year, do not have a German scholarship or have a job, you will have to record your fingerprints. This means, that you go along with me with all your regular documents and passport to the Ausländerbehörde to finger-print and if desired, you can later on give me the power of attorney to collect the digital card with your fingerprint, address and photo whenever it is ready. One pays 110 EUR the first time while subsequent extensions on the visa would cost 80 EUR. It is still unclear who are exempt from paying this fee, the DAAD stipend holders. A note of caution however: this visa card is not an ID card and needs to be carried along with the passport at all times.

**Does your office also offer any useful courses to the international researchers?**

Indeed, we have the Charité Internationale Academy that offers various courses. We do not have any basic German language courses, since it is difficult to get the German at one particular time. Usually people often go to the Volkshochschule as one gets to learn more, meet different people while the course is extremely cost-effective. We also offer specific courses in Statistics, or courses on German medical jargon for effective communication and presentation in German or English. However, but these courses cost a bit, and can be co-sponsored by your department if needed and be paid in parts. Even though they are not so cheap, such courses are definitely an investment and could perhaps improve your skills and be beneficial to you in certain ways.

**That is good to know. This brings us to the last question. Based on your previous experiences and feedback, how affordable is the Charité towards the international community of researchers?**

Let’s put it this way: there is scope for improvement as far as communication with newly arrived international researchers is concerned. The personnel working at various offices in Charité speak mainly German and may appear very direct and unfriendly at the outset, so a person who faces them for the first time gets a rude culture shock apart from getting overwhelmed by the entire German bureaucratic system. This leads to plenty of misunderstandings. Having said that, a two-way street and I certainly see ways of improving the unfriendly attitude of these personnel no matter how busy they are. My opinion is that these personnel should receive some training on how to be more aware, empathetic and more accommodating when dealing with international scholars of the Charité for the first time. This could certainly create a more genial image of the Charité (smiles).

And we hope to see that change soon. It was a pleasure interviewing you, Palmea. Thank you once again for the insights you provided our newsletter into the functioning of the Welcome Center at the Charité International Cooperation office.

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**Bad Science**

A Man Who Signed His Dead Cat Up As a Certified Professional Member of the American Association of Nutritional Consultants to Prove a Point

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*Let me tell you how bad things have become* begins Bad Science, before describing the Brain Gym exercises currently practiced in British schools. If you, as a budding neuroscientist (or even just as a sane individual), are concerned by the idea of children being taught that nodding their heads vigorously will make them smarter by increasing blood flow to the frontal lobes then you might want to read on. Ben Goldacre, a British doctor, is on a crusade and this book outlines his manifesto. He targets three main audiences and carries them on a crash course through modern science, mainstream media and money-making ‘medical’ quackery. Goldacre writes for us scientists - as well as reaching out to people with no scientific education and implores his ‘enemies’ - scare-mongering journalists and greedy nutritionists - to see reason.

The book outlines a clear set of ideas about the advancement of public knowledge of science and Goldacre explains the obstacles he sees to these goals through a series of succinct examples of media debacles and blatant false advertising. Bad Science is the art of misinterpreting statistics, underestimating placebo effects and taking advantage of health worries and scientific ignorance in the general public to make a quick buck. Most of this is explained whilst maintaining a humorous tone - if you like gathering fun facts about the reality of recreational drug use or finding out the truth about ‘Horny Goat Weed’ aphrodisiacs then this is your book - but he also describes a darker side: the people who don’t want to stop making money from dodgy therapies. One chapter is only included in the most recent edition of the book as Goldacre was being sued for libel by its subject, a multivitamin-pill magnate peddling lies in AIDS-striken South Africa.

As a population with at least basic knowledge of the procedures of evidence-based medicine, we medical neuroscientists may end up feeling a little smug as Goldacre dips into statistics and scientific reasoning. Despite this, for me at least, it served as a necessary reminder that one must always seek the full story beneath anything from a peer-reviewed academic paper to a sensationalised tabloid newspaper article. Although probably preaching to the converted, Goldacre’s closing plea to scientists to make sure our work is known and not misinterpreted is sound advice. This book will make you reassess the way you think about science in the media. Please read it (or at least watch his TED talk). *(er)*

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Check this out: [http://www.ted.com/talks/ben_goldacre_battling_bad_science.html](http://www.ted.com/talks/ben_goldacre_battling_bad_science.html)
Oblicza Neuronauk ‘Faces of Neuroscience’

By Filip Morys, MSc Student Medical Neurosciences

Warsaw welcomes you, young neuroscientists. ‘Faces of neuroscience’ is a project, created by a group of keen students from the University of Warsaw, Poland, in order to popularize neuroscience in all of its aspects among young people. To make it even more interesting, these young scientists have organized a conference that is certainly worth mentioning. It took place in the capital city of Poland, November 4 to 6, 2011.

The task was very hard to perform; however, it must be said that the organizers did a great job, especially by gaining many sponsors and patronage of the Polish Neuroscience Society. Quite an achievement for a first edition, isn’t it?

Five sessions of the conference (‘neurobiology’, ‘neurocognitive’, ‘neurology and neurosurgery’, ‘neuroinformatics’ and ‘borderland of neuroscience’) gave a general picture of the broad interests of young and future scientists. All of the speeches were presented in Polish and a few of them were especially noteworthy, including ‘The role of the reward system in food intake’, a speech that interested not only biologists but also psychologists, and ‘Electrophysiological indicators of the deterioration of attention during aging’, which presented an interesting approach to the subject.

Organizers had invited the most distinguished professors from the Polish neuroscience scene, who delivered their speeches about stem cells, neuromarketing, cognitive psychology, learning processes and much more.

The conference was not only about attending lectures! Being students, the organizers obviously included a party in the agenda, so there was no time to get bored but instead lots of time to meet people sharing your interests!

With a performance like this in 2011, it is hard to imagine how it can possibly get better in 2012! And my information source told me that preparations for the next edition of the conference have already begun.

Berlin Brain Days 2011

By Filip Morys, MSc Student Medical Neurosciences

Organized for the eighth time, and for the fourth time with cooperation of six graduate programs, the Berlin Brain Days 2011 were a huge success. From December 7 to 9, many international students attended our annual PhD symposium devoted to the broad field of neuroscience. The meeting was opened by a lecture on addiction, delivered by Christian Lüscher from the University of Geneva. Also, students from the two graduate programs Medical Neurosciences and Computational Neurosciences received their graduation diplomas.

The second and third day of the BBD were full of lectures and scientific discussions. On Thursday, Frank Bradke spoke about cytoskeletal mechanisms of axonal growth and regeneration, Luiz Pessoa explained the relationship between emotions and cognition and Adrienne Fairhall introduced the audience to the basics of deconstructive and adaptive coding. On Friday, Kalanit Grill-Spector re-thought the functional organization of the human high-level visual cortex, Hermona Soreq delivered a lecture about micro-RNAs in the interface between inflammation and neurodegeneration and Hans Markowitsch spoke about memory and the brain.

All the science was followed by an improvised comedy show by the Creative Heads, which preceded the awards for best posters and best talks.

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<tr>
<th>Best Talks</th>
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<tr>
<td>1st Jorge Jaramillo</td>
<td>1st Ekaterina-Maria Lyras and Nefeli Slavi</td>
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<td>2nd Jakob Gutzmann</td>
<td>2nd Theodora Mour</td>
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<td>3rd Michael Kintscher</td>
<td>3rd Bernhard Sonnenschein</td>
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After a short break, participants could have a rest and some fun at a BBD party, which definitively closed the whole event and was a perfect addition to these three days that had been literally filled with science.
**ISN 2011**

The ISN 2011 is jointly organized by the International Society of Neurochemistry (ISN) and the European Society of Neurochemistry (ESN). It was held in the capital city of Greece, Athens, from August 28 to September 01. The ISN provided several travel grants for presenting a poster at this event. It was a big event with over 900 people, 33 symposia, 10 workshops, and 6 young investigator sessions to overview the latest advances in molecular and cellular neuroscience. More than 300 students presented posters in various sessions. *(mir)*

**SiNAPSA Neuroscience Conference ‘11 (SNC’11)**

My participation in the SiNAPSA Neuroscience Conference ‘11 (SNC’11) in the beautiful city of Ljubljana, the capital of Slovenia was a wonderful experience. Not only in terms of scientific knowledge but I also enjoyed the city itself. The conference was held from September 22 to 25, 2011. The FENS and SINPASA provided several travel grants to students for participation in the conference. In the poster sessions, over 170 students presented their findings. There were several parallel sessions during the three days covering almost every field of neuroscience such as:

- Molecular neuroscience
- Systems neuroscience
- Cellular neuroscience
- Clinical neuroscience
- Cognitive neuroscience
- History of neuroscience
- Computational neuroscience

During the conference, several courses and educational workshops were offered, such as an educational workshop on affective neuroscience, an international course on EMG, SFEMG and nerve ultrasonography, and a workshop on ethical dilemmas in neuroscience.

Apart from the main conference and in order to encourage young students and researchers, a separate program with the title ‘Young Neuroscientist Forum Ljubljana 2011, (YNFL’11)’, was also organized. During the YNFL’11, 22 students presented their research using posters. *(mir)*

**1st IBRO-KIST School of Neuroscience**

The 1st IBRO-KIST School of Neuroscience was held between June 26 to July 08, 2011 in Seoul, South Korea. As the name of the summer school indicates, it is sponsored by IBRO (International Brain Research organization) and KIST (Korea Institute of Science and Technology) Seoul, Korea. Out of 112 applicants from various countries, 15 students were selected, including students from Korea, the Republic of Korea, Iran, United Kingdom, China, Japan, Pakistan and India. To provide PhD students and Junior Postdocs with current and applied neuroscience research, hands-on practice-based sessions had been designed in various labs. This summer school focused on cutting-edge techniques in systems neuroscience, including EEG recording, in vivo single unit recording, deep brain stimulation, optogenetics, transgene delivery, and functional imaging of brain activity.

The course comprised two components: each morning, didactic lectures on ‘Systems Neuroscience’ and advanced technologies were held by prominent faculty members and researchers of the appropriate fields. Later each day, time was devoted to hands-on training sessions where students could gain practical experience. At the beginning of the school, a poster session was arranged by students. In addition, during the practical training sessions, each group had lab discussion about what had been learnt and the results of the day were presented. At the end of the school, a symposium was organized by students in which they delivered and presented data obtained during the two weeks. Students were especially inspired by optogenetic techniques since they provide results within a short time compared to conventional electrophysiological methods of recording. Despite the fact that it was the most laborious and tiring school I have ever attended (sessions from 9am in the morning until presentations at 10pm), I really enjoyed it and learned a lot. *(mir)*

**Contest:**

For each issue, we would like to also include your contributions. You can submit anything you see fit on the topic of neuroscience. Send us your most exciting microscopic pictures, or a creative photo, thoughts on neuroscience or self-written poems - whatever comes to your mind! The best contribution will be published and rewarded with a 25€ voucher for Lehmanns bookstore. So, what are you waiting for, start the engine of your mind and get going! Trust us, it is worth participating! Send your contribution to cns-newsletter@charite.de to win a 25€ voucher for Lehmanns bookstore. **Deadline for submission:** April 30, 2011.

This issue’s winner is **Filip Morys** who reported about two conferences he had visited. Thank you very much for your contribution!
Neuroscience in Your Everyday Life

Why Is It Again that Light Reflects Off of Animal Eyes at Night? Why Doesn’t It in Humans?

The phenomenon of ‘eye-shine’ is seen in a variety of species, and is thought to be due to the presence of an intraocular reflecting structure, the tapetum lucidum. This structure was described as early as 1854 in the Medical Lexicon by Robley Dunglison (p. 843):

“TAPETUM, Ta'petry, Tape'tum choroidea. A shiny spot, on the outside of the optic nerve, in the eyes of certain animals, which is owing to the absence of the pigmentum nigrum, occasioning the reflection of a portion of the light from the membra Ruyschiana.”

And he wasn’t too far off back then. The tapetum lucidum is basically a biological reflecting system that is a common feature in the eyes of vertebrates. Some species, usually diurnal animals (primates, squirrels, pigs), do not have this structure. Depending on the species, location and composition may differ; the tapetum lucidum can either be located within the retina or within the choroid behind the retina. The reflecting material in the tapetal cells also varies from guanine crystals (in some teleosts, reptiles) or lipid (in some teleosts, some mammals) to zinc cysteine/Riboflavin/collagen (most mammals). Therefore, not all animals eyes glow the same color, ranging from yellow, to green, to blue, and everything in between. Age and light angle can also affect the color of the eye shine. The tapetum functions like a mirror and provides the light-sensitive retinal cells with a second opportunity for photon-photoreceptor stimulation, thereby enhancing visual sensitivity at low light levels.

But wait a second... what about the ‘human’ red eye effect in pictures? Interestingly this effect rarely occurs in animals that have a tapetum lucidum; however, as we all know, it often does in humans. The cause of it is that the light flash occurs too fast for the pupil to close, allowing much of the very bright light from the flash to pass through the pupil into the eye. It then reflects off the fundus at the back of the eyeball and out through the pupil. The red to orange color which we then observe on photographs is due to the reflection of light from choroidal blood vessels.

Do you also sometimes wonder about the simple neuroscientific questions in everyday life, but don’t really feel like looking them up right away? For questions like this, just mail us your question (cns-newsletter@charite.de) and Dr. Harebrained will give us his explanation in the next issue! Our next issues question: Why is it again that we yawn? (vl)

References:
- Dunglison, Medical lexicon, p. 843, 1854
- Ollivier, Vet Ophthalmol, 2004

Calendar of Events

| March       | 7-9 | 3rd EFCAP Congress: Young Offenders and Victims - Forensic Psychiatry and Psychology in Children, Adolescents and Young Adults (http://www.efcap2012.de/) |
| April       | 23  | Charité Entrepreneurship Summit 2012 (http://www.charite-summit.de/) |
| May        | 2-5  | Neurorepair 2012 in Potsdam (http://www.neurorepair-2012.de) |
|            | 3-4  | 2nd Symposium on Adaptive T Cell Therapy (http://www.sfb-tr36.com/) |
|            | 3-6  | 8th International Congress on Mental Dysfunction and Other Non-Motor Features in Parkinson’s Disease and Related Disorders (www2.kenes.com/MDPD2012) |
|            | 9-12 | Force transduction and emerging ion channels (http://www.forcechannels2012.de) |

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