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EHDN News

EUROPEAN **HUNTINGTON'S DISEASE** NETWORK

Astri Arnesen

The next deadline for the EHDN/International Parkinson and Movement Disorder Society Fellowship Exchange Programme will be the end of February 2017.

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EHDN 2016 – progress in plain language

Jean-Marc Burgunder, Chair, EHDN Executive Committee

The 2016 plenary meeting followed EHDN tradition in bringing together scientists and clinicians from diverse specialities with people affected by HD and their families and carers. This year there was one important innovation, however: we asked presenters to preface their talks with a few words that explained the significance of their work in plain language. The speakers understood what was being asked of them very well, and judging by the feedback we have received from delegates with a non-scientific background, or who work in disciplines other than the one under discussion, the innovation was a success.

Much of the science presented at the meeting was novel and exciting, as this newsletter will attest. It's always hard to pick out individual talks, but this

Jeff Caroll

Emilie Hermant

Anne Lennon-Bird

Martha Nance

year we were treated to some motivating insights from research in other diseases, notably the positive results of the application of RNA therapy to neuromuscular diseases of children. These kinds of presentations bring home to us just how important it is to look beyond our own field for guidance about the directions our research could take – and for hope that it will ultimately make a difference.

On a personal note, I was particularly impressed by the speakers in the session entitled "Living with HD", who talked about the disease from the perspectives of a scientist (Jeff Carroll), an artist (Emilie Hermant), a mother (Anne Lennon-Bird) and a physician (Martha Nance). One idea they conveyed, that touched me deeply, was that those affected by the disease can sometimes discover an inner world – one they might not have been aware of previously, but that can be a source of boundless creativity. As a clinician, I believe I have caught glimpses of that creativity, in chronic care situations, but not wanting to impose my own interpretation, I hadn't dared reflect on its deeper significance. What these speakers made clear is that there is inner peace to be found, even in the shadow of HD – a butterfly emerging from the cocoon. Finally, it was wonderful to hear more than one speaker raise the subject of laughter. Laughter, it seems, does indeed have therapeutic properties – in HD as in life in general. What is certain is that it strengthens bonds in the fight against HD, be it in the clinic or in a tremendous meeting such as the one we had in The Hague.

Clinical trials – past, present, future

Starting with the good news, **Monica Busse** (Cardiff) reported that a phase 2 trial of a supervised exercise regime in patients with early to mid-stage HD had led to significant improvements in the Unified Huntington's Disease Rating Scale-Total Motor Score (UHDRS-TMS), as well as in fitness. No improvement was seen in cognitive performance, however, and patients in the exercise group lost weight – something that could be offset by a balancing nutrition regime in future trials.

Claudia Testa (Richmond) presented positive results from First-HD, a phase 3 trial of deutetrabenazine for HD, explaining that it had met both its primary endpoint, of reduced chorea, and its secondary endpoint of significant improvement in patients' and clinicians' overall impression of change. Deutetrabenazine has the same mechanism of action as the approved chorea drug tetrabenazine, but it is metabolised more slowly. An open-label extension trial, ARC-HD, is ongoing.

Topline results from Pride-HD, a phase 2 trial of the dopaminergic stabiliser pridopidine, indicate that the drug did not improve motor scores with respect to placebo. It did lead to improved motor scores, but the improvements were not significant, due to an unprecedented placebo response that lasted 52 weeks. However, said **Michael Hayden** of Teva Pharmaceuticals, the trial's sponsor, there was a significant slowing in the decline of total functional capacity (TFC) – the current gold standard for measuring HD clinical progression – that was particularly marked in early stages of the disease. In a statement released after the meeting, EHDN's executive committee (EC) said that the causes of this effect were not yet clear. The EC welcomed Teva's commitment to conduct a phase 3 trial, to address whether pridopidine can deliver functional benefits to HD patients.

CYST-HD, a trial of cysteamine for motor symptoms in 96 patients, did not meet its primary endpoint of an improvement in the UHDRS-TMS, probably because it was underpowered, said **Dominique Bonneau** (Angers). However the results of an ongoing open-label study are awaited. The mechanism of action of cysteamine is not well understood, but it has shown beneficial effects in at least eight animal models of HD. Another trial that failed to meet its primary endpoint was Action-HD, a study of buproprion for apathy in HD. **Harald Gelderblom** (Berlin) said that after 10 weeks of treatment with the drug, which works by blocking the re-uptake of neurotransmitters dopamine and norepinephrine, there was no significant improvement in HD patients' scores on the apathy evaluation scale AES-I, compared to those of untreated controls.

Bernhard Landwehrmeyer (Ulm) gave a roundup of ongoing clinical trials. These fall into two categories: investigator-initiated trials, and trials run by EHDN's partners in industry. Ongoing investigator-initiated trials include HD-DBS, a study of deep brain stimulation of the globus pallidus; a comparator trial of approved HD drugs olanzapine, tetrabenazine and tiapride; and a trial of laughter therapy for various neurodegenerative diseases including HD. Landwehrmeyer highlighted five trials being run by industrial sponsors, including Ionis's phase 1/2a trial of an antisense oligonucleotide (ASO) that targets huntingtin RNA to lower levels of the mutant protein (mHTT) in the brain. The trial is due to finish in September 2017.

The Ionis trial is the first of an ASO for HD. Fortunately **Francesco Muntoni** (London) was on hand to describe a similar trial that he was involved in, for the neuromuscular disorder spinal muscular atrophy (SMA). He described SMA as a kind of "genetic polio", because as in polio it is the motor neurons that are affected, meaning that children who have the disease lose muscular control. In the infant-onset form, signs appear before six months of age. Typically, these babies are never able to sit and they die before the age of two. The faulty gene is *SMN1*. But this gene has a "twin", *SMN2*, that is identical except for a small variation that means that only one in 10 *SMN2* genes is translated into the full-length protein. Ionis designed an ASO that corrects this "glitch", meaning that in theory, the missing SMN1 protein can be replaced by its functional equivalent, SMN2.

Francesco Muntoni

In a large phase 3 trial, this ASO – which goes by the name of nusinersen – was delivered to hundreds of babies with SMA via intrathecal injection, or lumbar puncture. Interim data from the trial, released in August, suggested that treated infants were living up to 60% longer than those who received a placebo. At that point, the trial was stopped and all the children in the placebo arm started receiving the treatment. Some of the children in the ongoing open-label study have learned to use their hands, sit, stand with support and even – in a few cases – walk independently. Muntoni said that nusinersen demonstrated the progress that RNA therapies have made, from proof of concept to phase 3 trials in less than a decade.

Looking to the future, CHDI's chief clinical officer **Cristina Sampaio** (Princeton) predicted that at most two, and more realistically one, first-in-human (FIH or phase 1) trials for HTT-lowering therapies will get underway in the next two years. Three or four new phase 3 or 2/3 trials are likely to be launched in the same period.

Update: Enroll-HD

Essential to the success of such clinical trials is the global observational study Enroll-HD, for which **Tim McLean**, EHDN's clinical operations manager and Enroll-HD's co-leader, gave a status update. So far, the study has recruited 11,721 participants at 133 sites in 14 countries. 76 of those sites are currently recruiting for three clinical trials, and 815 subjects have been randomised in those trials. But Enroll-HD is also contributing to the care of HD patients in another way. According to **Jan Frich** (Oslo), a member of the study's care improvement committee (CIC), researchers are using it to gather information on – and compare the efficacy of – different models of care in an evidence-based way. The CIC hopes that this will enable them to identify best clinical practices, and then apply them to the unmet care needs in the HD patient population – of which recent surveys have detected high levels, especially in the middle stages of the disease.

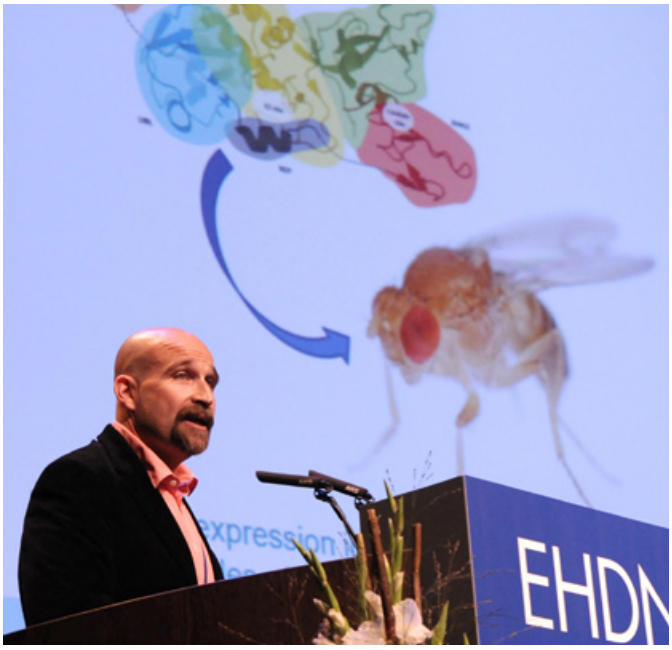
Enroll-HD is also supporting basic research in HD, as the study's principal investigator, **Bernhard Landwehrmeyer** (Ulm) explained. Two periodic data sets have been released to date, with a third scheduled for December 2016. 85 requests to use those data have been approved, and they are now being used to model disease progression and identify genetic modifiers of HD, among other things. There are also procedures in place for accessing specified data sets and biosamples collected through Enroll-HD, of which over a million are already in storage. Five so-called "platform" studies – that is, studies that make use of the Enroll-HD infrastructure and database – are being reviewed or have been approved.

The HD Clinical Trial Site Certification scheme will soon be up-and-running. All sites providing HD clinical care will be eligible to apply. Further details of the scheme and how to apply will be released in the near future.

Promising in preclinic

One longstanding area of interest in HD research has been energy metabolism, which is disrupted in the disease. A trial of coenzyme Q10, a naturally occurring compound that is found mainly in the cell's mitochondria or "powerplants", and contributes to the generation of energy in the form of ATP, failed in 2014. But researchers continue to think of energy metabolism as a promising therapeutic target, in part because of the publication in July 2015 of the results of a genome-wide association study conducted by the Genetic Modifiers of Huntington's Disease (GeM-HD) consortium, that identified three main clusters of genes that modify the age at onset of HD. These three clusters relate to energy metabolism, oxidative effects and DNA repair.

Robert Pacifici, CHDI's chief scientific officer, gave an overview of efforts to develop therapies that target energy deficits in HD. Pacifici thinks we need to understand more about energy metabolism before we try to modify it, and CHDI has been working with a number of groups to try to tease out relevant pathways. Recently, for example, researchers highlighted a role in HD for the gene *GPX6*, whose protein product counteracts oxidative stress. Stressed cells seem to be less able to make enough energy to survive. The key to understanding how metabolic processes relate to HD, Pacifici said, is to look in humans, to look in the central nervous system (CNS), and to look earlier in the disease – while remaining alert to the possibility that impairments in those processes may be an effect, rather than a cause, of HD.



Flaviano Giorgini

Flaviano Giorgini (Leicester) has been investigating the observation that mitochondria are excessively fragmented in HD, and that the mechanism for clearing damaged mitochondria from the cell – mitophagy – is also impaired, as it is in Parkinson's disease (PD). Work in PD has shown that a protein called Parkin controls mitophagy, and Giorgini's group has found that over-expressing Parkin in a fruit fly model of HD leads to a reduction in neuronal death and an extension of lifespan of roughly 35%. Parkin may therefore have a neuroprotective effect that merits further investigation.

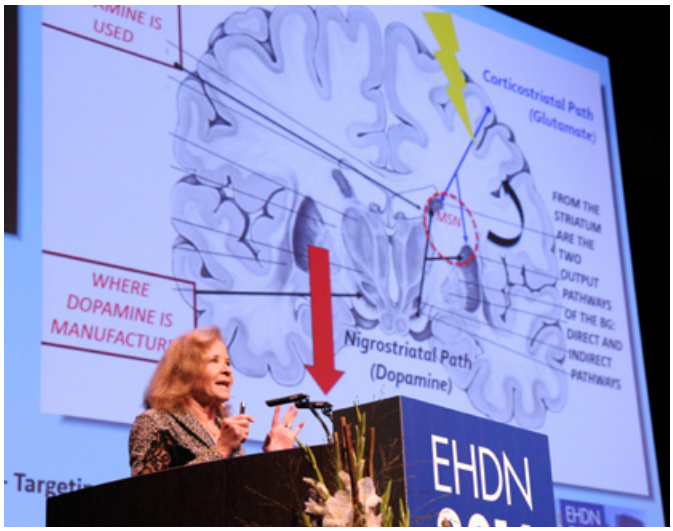
NRF2 is a master regulator of the cellular response to oxidative stress, and compounds have been identified that activate NRF2 by modifying a protein that regulates it, KEAP1, in such a way as to prevent the breakdown of NRF2. These drugs have been developed mainly for use outside the CNS, and they may not be suitable for use inside it. NRF2-KEAP1 binding can also be disrupted via a different pathway, however, and this one is potentially reversible, meaning that compounds that modulate it might be more appropriate for neurological indications. NRF2 and KEAP1 interact at a so-called Kelch domain in the terminal portion of KEAP1 – a domain that provides a sufficiently narrow "pocket" to be druggable by small molecules. **Alberto Bresciani** (Pomezia) and his colleagues have screened hundreds of compounds for their potential to bind to this domain, and they are also developing or improving tools that will enable them to accurately assess that binding potential.

A drug that has already been approved for multiple sclerosis (MS), and that may also be of interest for HD, is dimethyl fumarate or DMF (brand name Tecfidera). As **Brian Wipke** of pharmaceutical company Biogen explained, this is thought to work via two main pathways – an anti-inflammatory pathway, and a cytoprotective pathway that buffers cells from oxidative stress by activating NRF2. Its cytoprotective effects seem to contribute to the preservation of neuronal axons in MS, by reducing their demyelination and eventual transection. Some *in vitro* evidence for DMF's cytoprotective properties comes from work showing that human astrocytes survive for longer after an oxidative insult, if they have been treated with DMF.

Jeff Johnson (Madison) has developed a transgenic mouse that overexpresses NRF2 specifically in astrocytes. By crossing this mouse with the R6/2 mouse model of HD, his group was able to show that overexpression of NRF2 in astrocytes did not extend the lifespan of the HD mice. However, it did result in modest improvement in motor performance, notably in the rotarod and open field tests, and this encouraged them to explore the effects of NRF2 overexpression in neurons, in an HD mouse. That project is ongoing.

Jeff Johnson (left) and Brian Wipke (right)

ASOs targets the gene "message", or RNA. An alternative approach targets the DNA, and **Matt Chiocco** of Shire presented his company's efforts to "silence" the HD mutation by combining zinc finger proteins – which recognise the CAG sequence – with a transcriptional repressor. Chiocco's team delivered this drug to the brain of an HD mouse packaged in an adeno-associated virus (AAV), a vector that harmlessly infects brain cells. HD mice have an abnormal paw clasping response, but this was corrected by the drug. The team was also able to show that the drug selectively engaged the CAG expansion in the HD gene, and reduced its transcription by 60%.



Beth Fisher

Tapping into brain plasticity

The human brain possesses exceptional reserves and a capacity to compensate for damage that researchers have long been interested in enhancing in the hope of slowing, stopping or even reversing the ravages of HD. And not just HD. In PD, typically, the brain's substantia nigra loses up to 80% of its dopaminergic neurons before the patient reports symptoms.

Reporting from the PD field, **Beth Fisher** (Los Angeles) presented a finding that intensive treadmill exercise is associated with an increase in the expression of dopamine D2 receptors in the brains of mice and a small cohort of humans, as measured by PET imaging. The dopamine deficit that causes PD has the downstream effect of unleashing hyperexcitability in the cortex and striatum. D2 receptors are inhibitory, and Fisher's group found that the increase in their expression was accompanied by changes in glutamate receptors on medium spiny neurons in the mouse striatum, that caused those neurons to become less excitable. In a human study, they then applied transcranial magnetic stimulation (TMS) to the part of the motor cortex that controls the hand, before and after 24 exercise sessions. Those who had participated in the high-intensity workouts had a significantly lengthened cortical silent period – a measure of the strength of inhibitory influences on corticostriatal excitability. Fisher concluded that exercise has the potential to drive disease-modifying changes in PD.

Marina Papoutsi (London) has been exploring another way of stimulating cognitive performance in HD patients: neurofeedback. This works by asking a person to imagine performing a physical activity – swimming, say, or cycling – while lying in an MRI scanner. As they do so, they are presented with a near real-time, visual readout of the activity of their brain's supplementary motor area (SMA), and asked to adapt their imagery until, by trial-and-error, they find ways of increasing that activity.

In a small study of 10 early-stage HD patients, called HD Brain-Train, Papoutsi and colleagues found that all of them were able to increase their SMA activity over time, and eight of them showed improvements on post-training tests of HD progression – improvements that were associated with increased grey matter volume in the SMA, and increased connectivity between the SMA and the striatum. Papoutsi said that neurofeedback – which patients report is enjoyable – could potentially be used preventatively, or to boost brain re-organisation following treatment with an HTT-lowering therapy. Further trials are underway.

Finally, **Anne Rosser** (Cardiff) gave an update on cell replacement therapies for HD. Small-scale studies in humans have shown that transplanting fetal cells into the brains of HD patients is feasible, largely safe and well tolerated. Preliminary evidence, notably from the group of Anne-Catherine Bachoud-Lévi in France, indicates that it can also result in behavioural improvements. The technique is not yet reliable, however. Two outstanding issues are the need for better donor cells, and the question of whether the grafts need to be retrained. The Repair-HD consortium, which includes Rosser's group, is exploring alternatives to scarce and unstoreable fetal tissue – in particular human pluripotent stem cells – and looking at how to optimise the differentiation of such cells into neurons. Retraining seems to be desireable, and Rosser's colleague Stephen Dunnett is using animal models to explore ways of delivering it – for example, by enriching the graft recipient's environment.

What is the pathogen?

As senior scientific advisor emeritus to CHDI **Allan Tobin** observed, the HD story turns out to be far more complex than was anticipated when the mutation that causes it was identified in 1993. Though one mutation in one gene is responsible for HD, the exact nature of the pathogen remains mysterious – as several recent studies confirm.

Robert Pacifici, Laura Ranum and Darren Monckton

Presenting one of these, **Laura Ranum** (Gainesville) described an unexpected category of mutant proteins that accumulate in HD patients' brains, called repeat associated non-ATG (RAN) proteins. The discovery was unexpected because these proteins are made even in the absence of the usual "green light" for transcription, ATG. In HD, Ranum's group found, expansion mutations generate two RNAs and up to six proteins besides mHTT. They have yet to show that RAN proteins harm the brain, but RAN proteins are toxic to cells *in vitro*, and like mHTT, they build up in striatal and frontal brain areas. The good news is that, because many therapeutic strategies for HD target RNA, they eliminate one of the RNAs made as a result of the transcription of expansion mutations, eliminating three of the RAN proteins as well as mHTT. However, if it is shown that RAN proteins harm the brain, it may be necessary to consider strategies that target the other RNA too.

The test for the HD mutation is a blood test. That means that it measures the length of the CAG expansion in the HD gene in the nuclei of blood cells. But as **Darren Monckton** (Glasgow) explained, long repeat sequences are unstable, and the length of that expansion can vary enormously between different cell types – even in the same HD mutation carrier. Striatal neurons can contain thousands of repeats, for example, as compared to 40 or 50 in a blood cell. Given that we know that age at onset is correlated with the length of the CAG expansion in blood cells, how does that instability – and particularly the much longer expansions found in neurons – contribute to HD?

Nadira Ali and Gillian Bates

Another outstanding question concerns the incomplete splicing of the HD gene during transcription. In mice, this leads to the formation of short RNA fragments containing the expanded CAG sequence, but it remains unclear to what extent these fragments are also formed in patients' brains, since they have been difficult to detect there until now. **Nadira Ali** and **Gillian Bates** (London) described a new, more sensitive assay for detecting the intron or non-coding sequences that are incorporated into those fragments as a result of aberrant splicing, based on the reverse transcription polymerase chain reaction. Using this assay, they have easily detected RNA fragments in post-mortem brain tissue from HD patients, particularly if those patients suffered from early-onset forms of the disease.

My family and other animals

Dozens of mouse models of HD now exist, but the 0.5g mouse brain is small and smooth compared to the 1.5kg human brain with its convoluted surface. This means that findings don't always translate from mouse to human – a problem that sometimes only comes to light in the middle of a large and very expensive clinical trial, which has to be aborted as a result. Large animal models serve to bridge that translation gap. Though only humans suffer from HD, meaning that no model is perfect, such models can capture aspects of the disease that mouse models can't. To date, mid-sized or large animal models of HD include one sheep, four or more pigs, and around four monkeys – with more in the pipeline. When choosing which of these to use to answer biological or drug discovery questions, said **David Howland**, CHDI's director of model systems, it is essential to match the model to the specific aims of the experiment.

Jenny Morton (Cambridge) emphasised that, while a model must obviously be genetically and pathologically relevant, it must also be usable. The OVT73 transgenic sheep looks normal, but at five years of age it has brain pathology comparable to early-stage HD in humans. Sheep are highly amenable. They can be scanned in an MRI machine and monitored with electroencephalography (EEG). It is possible to study their

motor function, circadian rhythms, cognitive function and social behaviour. Morton's group has been testing the HD sheep on two-choice discrimination tasks that were designed for humans, but have been modified to capture the subtle cognitive changes that accompany the early-stage disease. The sheep could pass the tests, she said, and are "ready to go" as a model.

Ralf Reilmann (Münster) gave an update on the TRACK-tgHD minipig project, the porcine equivalent of the human TRACK-HD observational study. Pigs are useful models because their brains have already reached adult size by six months of age. They lend themselves to motor assessment including gait analysis, to cognitive assessment in the form of colour discrimination tasks, and to behavioural assessment based on dominance-submission behaviour patterns. Reilmann's group has been conducting high-resolution MRI imaging of the animals with a view to compiling a brain atlas that will be published soon. They are also about to launch a study of an HTT-lowering therapy with the pharmaceutical company uniQure. TRACK-tgHD has just completed its third year, and has funding for five more.

The first monkey model of HD was created by introducing a mutant form of the HD gene into the oocytes of rhesus monkeys. The result was four transgenic monkeys that **Anthony Chan** (Atlanta) and colleagues studied alongside four age-matched, non-transgenic controls, in a longitudinal study that spanned prodromal and symptomatic stages of a progressive, HD-like disease. The study encompassed motor and cognitive assessments as well as imaging and post-mortem pathological analyses. Having described the natural history of the disease in monkeys – the model animal that shares most genetic homology with humans – and developed sensitive measures of when particular deficits emerge, Chan's team feel the monkey model is poised to provide useful insights into HD biology and to aid drug discovery.

The science of measurement

Bringing new therapies to market is only possible if tools exist for accurately testing their efficacy. Hence the importance of biomarkers. CHDI is trying to develop quantitative biomarkers for the by-products of energy metabolism, reactive oxygen species, as well as molecular, imaging and physiological biomarkers of mHTT in the brain, for quantifying the efficacy of HTT-lowering treatments.

For a long time it wasn't clear if mHTT could be quantified in cerebrospinal fluid (CSF), but as CHDI's director of drug discovery and development **Douglas Macdonald** reported, we now know that it can. That result was published in 2015, and the Enroll-HD platform study HDClarity is now busy collecting CSF from HD mutation carriers and healthy controls. In the next three years, it hopes to collect 18 litres of CSF. Various assays have been developed for quantifying mHTT in CSF, including Singulex's Erenna single molecule counting platform, which provides

femtomolar sensitivity and is now available to the HD research community. Imaging biomarkers include novel PET ligands that bind either enzymes or receptors whose expression is altered in HD, and whose binding is modulated when mHTT is lowered. Physiological biomarkers include quantitative EEG to measure possible changes in neuronal activity when mHTT is lowered.

Early attempts to assess the impact of exercise on motor symptoms in HD were hampered by the difficulty of evaluating complex interventions such as sport or education, but ExeRT-HD followed guidance for conducting such evaluations first issued by the UK's Medical Research Council in 2000, and updated in 2006.

Apathy, a major problem in HD, is also difficult to assess. Currently this is done by means of pencil-and-paper tests that are neither suitable for all patients nor translatable to animal models. **Duncan McLauchlan** (Cardiff) described his group's attempts to develop a battery of more sensitive and widely applicable tools for measuring apathy. They tested 53 HD mutation carriers at various stages of the disease using the current gold standard – the problem behaviours assessment apathy score and apathy evaluation scale – and then compared their scores on those scales with their scores on tests of reward, effort, sensitivity to negative stimuli, decision-making and learning. They found that both apathy measures were related to impaired sensitivity to negative stimuli and deficits in decision-making, but not to reward, effort or learning. It seems, therefore, that HD patients' ability to change their behaviour even when it becomes counter-productive is impaired: they are "stuck in a rut". If so, then prompting may be the most effective behavioural intervention for apathy.

Ralf Reilmann gave an update on the development of the quantitative motor (Q-Motor) system. This assesses various motor functions including tongue protrusion, grasping, chorea and finger-tapping. It is designed to provide objective, physiological measures of the disease, and in so doing to complement the more subjective, categorical measures of the UHDRS. Changes in these physiological variables are detectable between 10 and 20 years before diagnosis, and because they are quantifiable, they can be tracked longitudinally and compared reliably across sites. Q-Motor has already been used in clinical trials where it has been shown to align well with UHDRS scores, and to be sensitive. In Pride-HD, for example, it corroborated the finding of an improvement in TFC in early-stage patients.

Business meeting

Following the summer's elections, **David Craufurd** (Manchester), **Ralf Reilmann** (Münster) and **Raymund Roos** (Leiden) have been re-elected to the executive committee (EC), while **Sandrine Humbert** (Paris) and **Patrick Weydt** (Ulm) join it for the first time. **Joaquim Ferreira** (Lisbon), **Bernhard Landwehrmeyer** (Ulm) and **Sarah Tabrizi** (London) stand down from the EC. **Kristina Becanovic** (Stockholm), **Leonor Correia-Guedes** (Lisbon), **Esther Cubo** (Burgos), **Caterina Mariotti** (Milan) and **Kathrin Reetz** (Aachen) join the scientific and bioethics advisory committee (SBAC), replacing in two steps **Chris Frost** (London), **Jennifer Thompson** (Manchester) and **Patrick Weydt** (Ulm) – who stand down now – and **Flaviano Giorgini** (Leicester) and **Hugh Rickards** (Birmingham), who do so in a year's time.

Thanks...

...to all those who made EHDN2016 a success, including the combined organising and programme committees co-chaired by Anne Rosser, and EHDN central coordination (especially Katrin Barth, Katharina Feihle and Kathrin Ring). Thanks to Ethan Signer and Allan Tobin, and to Jeff Carroll and Ed Wild, for their inspiring nightly round-ups, and to Alice Wexler for her commemoration of George Huntington. Thanks to all those departing from the various committees who have contributed to EHDN's growth in size and experience over recent years. And last but by no means least, thanks to sponsors Teva, uniQure, Pfizer, BioRep, AOP Orphan, Raptorpharma, Roche, Shire and the City of The Hague. Thanks in particular go to the CHDI Foundation, without whom neither the network nor the meeting would have been possible.

Photos by Gabriele Stautner, Artifox Communication Design, Ulm, Germany, for EHDN

More photos can be found here.
The full plenary report can be found here.

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Dates for your diary

Save the dates for

- 4th Symposium on RNA Metabolism in Neurological Disease (satellite to the 2016 Meeting of the Society for Neuroscience), San Diego, USA, 10-11 November 2016
- Understanding the Human Brain – A New Era of Big Neuroscience, Brussels, Belgium, 29 November 2016
- CHDI's 12th HD Therapeutics Conference, St Julian's, Malta, 24-27 April 2017