

Presidential Address

by *Feliciano Ramos, President of the ESHG*

The ESHG promotes research in basic and applied human and medical genetics and facilitates contact between all persons who share these aims.

Dear ESHG members:

We are approaching the next ESHG Annual Conference in Barcelona (May 21-24). It will be our 49th Conference, and the fourth time we are hosting it in Spain. We hope to have at least similar success as we had eight years ago (Barcelona, 2008), where 2,400 delegates attended the Conference. Besides the excellent scientific programme, everybody still remembers what was arguably the best Conference party ever in "El Pueblo Español". Hosting our Conference will be an important event for promoting human genetics in Spain, especially now that the specialty of Clinical Genetics has been officially recognized (August 2014). I am confident of the global success of the Conference and we hope to receive around 3,000 geneticists from all over Europe and abroad. Plenary sessions, concurrent (always interesting and never possible to attend all) sessions, workshops and poster viewing fill an exciting Programme in which we will have a new (soon a classic) "building bridges" session together with the ASHG. This year in Barcelona the topic is "germline genome editing", a very hot topic of great interest to many. Finally this will be another joint Conference with the European Meeting on Psychosocial Aspects of Genetics (EMPAG), a successful adventure that brings together our professional knowledge and experience in dealing with individuals and families affected by genetic diseases.



ESHG has been present, representing Europe, in the last International Congress of Human Genetics, celebrated in Kyoto in early April. A pre-Congress Conference brought all the continental Human Genetics Societies together to share experiences and ideas about our present and future in the Medicine of the XXI century. Of course we all have our local differences, but all societies agreed that education and good practices are two of the main goals to work on cross-border genetics.

Our society is smoothly and healthily growing and we now have more than 2,000 members, representing a total of 74 countries, 36 of them non-European. New members are attracted by our different membership fees (combined, developing countries, etc.), adapted to the different potential members' needs.

The EU-NHGS Presidents meeting, held during the Annual Conference, keeps all European HG societies connected and discussing common issues aimed at implementing uniform cross-border genetic practices and making them available to all European citizens. Collaborations of the ESHG with agencies like EURORDIS or EUCERD have contributed to that goal, especially in the field of rare diseases.

ESHG Committees play a fundamental role in achieving the main goals of the Society. Last year PPPC released two recommendation documents on non-invasive prenatal testing and on whole-genome sequencing in newborn screening. Both have been published in the EJHG (open format). The ESHG-EuroGentest Committee has been recently formed and is working in four areas: quality issues, professional guidelines, training and dissemination. The now restructured Education Committee has significantly expanded the ESHG course portfolio: new courses on preimplantation genetics, hereditary cancer, cardiac genetics and statistical genetics have been added to the classical ones: Bertinoro and Manchester. Education of young geneticists, senior geneticists (CME) and professionals from other medical specialties are the major challenges to be addressed in the near future.

As usual, the Annual Meeting and the Scientific Programme Committees working together have built a Conference Programme of excellence for Barcelona. World-class speakers and young doctors and scientists will share platforms to bring the most exciting genetics to the attendees. We all are proud of the hard coordinated work of both Committees. We also recognize the hard work of our Executive Officer, Jerome del Picchia, and his team at the Vienna Medical Academy, always available to solve any unforeseen problems before and during the Conference.

Since its creation in 2012, the European Board of Medical Genetics (EBMG) is working on the professional aspects of the three specialties of human genetics: medical genetics, clinical laboratory genetics and genetic counselling. Elaboration of syllabuses and definition of professional competences are two of the main issues the Board is working on, as well the creation of an European registry of professionals in each specialty. Currently, the Clinical Genetics Section is included among the specialties recognized by the UEMS (European Union of Medical Specialists).

During the last year, ESHG has released two important policy statements on Regulation on In Vitro Diagnostic Medical Devices (IVDs) (October 2015) and, with the contribution of EuroGentest, on the guidelines for diagnostic next-generation sequencing, this one recently published in the EJHG, as an open paper.

Last but not least, this year we have to elect four new Board members from seven nominees. I wish good luck to all nominees, all of whom are excellent candidates coming from six different European countries and one from the United States.

I would like to finish this presidential address saying that it has been an honour to have been the first ESHG President from Spain. I personally think that I have just been the "face" of the country's Human Genetics, which is now recognized as one of the most active in Europe, especially after the official recognition of the specialty in 2014, for both medical doctors and laboratory geneticists.

Do not miss the 2016 ESHG Conference in Barcelona! ... and remember that next year we will celebrate our 50th anniversary, in Copenhagen.

Feliciano J. Ramos
President of the ESHG

A personal welcome from the program chairs

by *Brunhilde Wirth and Joris Veltman*

On behalf of the ESHG Program Committee we welcome you to the ESHG conference in Barcelona. Based on the 2716 submitted abstracts (highest number ever), we expect a large number of attendees at the meeting. A highly attractive program will hopefully enable you to particularly enjoy this meeting, to foster your scientific work and to find sufficient opportunities to discuss science and develop new ideas. We hope you will meet many old collaborators and friends and find new ones. Enjoy the meeting overall and the city of Barcelona!

Activities of the Scientific Programme Committee

The Scientific Programme Committee (SPC) for 2015-2016 was composed of twenty regular SPC members: Brunhilde Wirth (co-chair, D), Joris Veltman (co-chair, NL), Yanick Crow (F), Helen Dollfus (F), Brunella Franco (I), Lude Franke (NL), Daniel Grinberg (ES), Maurizio Genuardi (I), Erik Iwarsson (SE), Jose Machado (PT), William Newman (UK), Minna Nystrom (FL), Lucy Raymond (UK), Alexandre Reymond (CH), Samuli Ripatti (F), Peter Robinson (D), Maria Jesus Sobrido (ES), Joris Vermeesch (BE), Xavier Jeunemaitre (F), Kristel Van Steen, four local SPC members from Spain: Juan Cigudosa, Pablo Lapunzina, Conxi Lazaro and Eduardo Tizzano, and three observers of the ESHG board: Francesca Forzano (I), Gunnar Houge (N) and Karin Writzl (SL). In addition Elisabetta Razzaboni (I), Sam Riedijk (NL) from EM-PAG joint this year SPC.

The SPC met twice to organize the ESHG conference in Barcelona 2016: in July 2015 in Barcelona to decide on the plenary sessions and symposia and in Vienna at the VMA offices in March 2016 to select the abstracts for oral presentations and posters.

All 2716 abstracts have been scored online by 3-12 evaluators, which apart from the SPC and the ESHG board included 122 external reviewers. We would like to thank all reviewers for their fantastic work and commitment. The ESHG will particularly acknowledge the contribution of all external reviewers by giving them a discount of 30% on the registration fee.

Based on topics and scores, 150 abstracts (5.6% of all submitted abstracts and 14.6% of abstracts submitted with the preference for an oral presentation) were selected for the 25 concurrent sessions including one plenary highlight session. The meeting has been extended to Saturday morning and a block of 6 additional concurrent sessions have been added. Among the oral presenters, 70 were Young Investigator Candidates (at least 1 in almost every session and half of all the presenters), reflecting the high level of contribution of young scientists to this program. From the 1829 poster presenters, 34 Young Investigator Candidates were selected for the best poster award and will be marked with an ESHG Rosette. Also, 601 abstracts will be presented as electronic posters and 55 abstracts were rejections either due to very low quality or multiple submissions of the same first author.

After the Barcelona conference, the SPC shall have to say goodbye to Daniel Grinberg, Genuardi Maurizio, Peter Robinson and Joris Vermeesch. We thank them for their excellent work and their dedication to making the meeting better. Also, after 7 years, Brunhilde Wirth will step down as chair and hand over this most important function for the ESHG meeting and society to Joris Veltman.

2016 Meeting Highlights

After the opening ceremony, the meeting will start with the first plenary session including three local stars: Mariano Barbacid, Carmen Ayuso and Carlos Lopez-Otin. The "What's new?" session will follow with the most exciting new findings selected from submitted abstracts.

The meeting will include 24 concurrent symposia, which will address topics of new insights and challenges from next generation sequencing in gene discovery, new mechanisms underlying human disease, functional studies and underlying pathomechanisms of various human disease groups, cancer genetics, clinical and social implications of genomics and the implementation of the new technologies in genetic testing, modelling in statistical genetics and analysis of complex datasets, challenges in clinical genetics and genetic counselling.

Four educational sessions will start already before the opening session on Saturday morning and more educational sessions will continue throughout the meeting. These include: Novel genome sequencing technologies, Genetic privacy and data sharing, Generation and use of induced pluripotent stem cells, Peroxisomal disorders – still a need for metabolic assays?, Ciliopathies, Cost-effectiveness in genetic testing, Cleaning the noise from big data, and Clinical interpretation of genetic variants.

Our initiative of building bridges between the ESHG and the ASHG will continue with a common symposium on Monday on "Debating germline genome editing" with Robin Lovell-Badge (UK), Annelien Bredenoord (NL) and Kelly Ormond (US)

On Tuesday, we will have an interactive debate on „My vision on Genomic Medicine?" with Jean Louis Mandel (FR) and Mary-Claire King (US).

The meeting will conclude with our distinguished speaker of the Mendel lecture Adrian Bird (UK), who will talk about his work on Rett syndrome. The ESHG award will be given to Stefan Mundlos from the Institute of Medical and Human Genetics in Berlin, in recognition of his groundbreaking work on how genomic rearrangements alter topologically associating chromatin domains causing gene misexpression and ultimately defects in skeletal development and bone diseases.

The meeting will end with awarding the Best Young Investigators: There will be 8 awards selected from oral presentations (4 ESHG, 1x Isabelle Oberlé, 1x Lodewijk Sandkuijl, 1x Vienna Medical Academy Award, 1 x Mia Neri Award) and 2x for the best posters selected from the category of "best posters" (abstracts scored >3.8 and not included in the concurrent sessions).

We wish you a fruitful, informative and enjoyable meeting in Barcelona.

Brunhilde Wirth & Joris Veltman

Co-chairs of the Scientific Program Committee 2016

PS: Similarly to this year, we already invite all ESHG members to propose topics and speakers for the 2017 meeting in Copenhagen: www.eshg.org/proposeaspeaker.0.html

Please do this before our next SPC meeting on July 4th 2016 so your proposal can be taken into consideration!



The ESHG SPC during the abstract selection meeting, March 2016, Vienna.

Report from the Public and Professional Policy Committee 2015-2016

By *Martina Cornel, Chair of the PPPC*

The Professional and Public Policy Committee aims at:

- Identifying and discussing the ethical, social and policy issues related to human genetics and its application in research, clinical practice and laboratory genetic services.
- Being informed of various research projects, conferences and events, as well as policy initiatives and actions relating to those issues
- Informing and stimulating the discussion around these issues at meetings
- Addressing these issues and providing guidance through background documents, policy statements, recommendations or other publications
- Participating in the public debate around these issues



- Informing, interacting with and providing advice to national and international policy makers

In 2015-2016 the PPPC proposed and further developed workshops and educational sessions for ESHG/EMPAG, ASHG and Brocher Foundation. Some examples are: ESHG meeting: E6 Cost-effectiveness in genetic testing; EMPAG Educational Session: DTC genetic testing revisited: empowering patients – caring for consumers?; W08. Pre-conception carrier testing; W18. The clinic: From face-to-face to interface.

In January 2016 the PPPC met in Zaandam (see picture), simultaneously with the new Professional Guidelines sub-committee of ESHG-EuroGentest Committee. To be transparent about the procedure of development and **endorsement** of ESHG guidelines and recommendations, first the current procedures were discussed and described, after which they were sent to the Board for approval in May 2016. Officially endorsed ESHG recommendations follow a procedure of agenda setting, preparation in a multidisciplinary setting, consultation of ESHG membership and external experts, integration of suggestions and voting by Board. Other types of papers can be developed for educational purposes or to contribute to discussion, or as fast response in a letter of the president of ESHG, in which case committees are available for consultation.

Responsible implementation of expanded carrier screening

In 2015-2016 the European Society of Human Genetics developed recommendations regarding responsible implementation of expanded carrier screening. Carrier screening is defined here as the detection of carrier status of recessive diseases in couples or persons who do not have an a priori increased risk of being a carrier based on their or their partners' personal or family history. Carrier screening aims to facilitate informed reproductive



The PPPC in January 2016 in Zaandam.

decision-making among identified carrier couples. In previous decades, carrier screening was typically performed for one or few relatively common recessive disorders associated with significant morbidity, reduced life-expectancy and often because of a considerable higher carrier frequency in a specific population for certain diseases. New genetic testing technologies enable the expansion of screening to multiple conditions, genes or sequence variants, and allows testing of individuals regardless of ancestry or geographic origin. Expanded carrier screening panels that have been introduced to date have been advertised and offered to health care professionals and the public on a commercial basis. This document discusses the challenges that expanded carrier screening might pose in the context of the lessons learnt from decades of population-based carrier screening and in the context of existing screening criteria. The final recommendations include e.g. the following: in line with the primary purpose of carrier screening (increasing reproductive autonomy), priority should be given to carrier screening panels that include (a comprehensive set of) severe childhood-onset disorders and the main focus should be on reporting sequence variants that clearly affect function; evaluation of new models of consent (e.g. 'generic consent') in this context is required; the effectiveness of carrier screening programmes should be measured by assessing the extent to which it optimises informed choice and reproductive decision-making and not by demonstrating how much it reduces the birth prevalence of affected children; and, governments and public health authorities should adopt an active role in discussing the responsible introduction of expanded carrier screening. The document aims at contributing to the public and professional discussion and to arrive at better clinical and laboratory practice guidelines. The final document has been published in *Eur J Hum Genet* 2016 Mar 16. doi: 10.1038/ejhg.2015.271 <http://www.ncbi.nlm.nih.gov/pubmed/26980105>. The summary and recommendations are available in *European Journal of Human Genetics* 2016;24:781-783.

Genomic Sequencing Results in Pediatric Practice

In October 2015 McCullough et al. published their paper 'Professionally Responsible Disclosure of Genomic Sequencing Results in Pediatric Practice' which focused on the Pediatrician's role in disclosure of results. In December 2015 the PPPC discussed some salient issues related to the larger landscape of results in pediatric genomic sequencing, such as: the pre-symptomatic testing of minors, the ethical and psychological differences when testing a child with an established but unknown diagnosis and testing healthy parents, the need to provide parents with adequate counselling and support to manage discussion with their children about future disease risks, the need to educate and support non-genetic specialists in appropriate offering of these tests to families, and the secondary and/or future (clinical) use of data and data storage, especially as they relate to consent. A plea for multidisciplinary and an acknowledgement of the roles of various clinical specialists concerning genomic sequencing was advocated to ensure that patients are supported adequately and safely, as this technology will increasingly have an important role in medical practice. A brief comment from members of the PPPC has been produced and published in *Pediatrics* (<http://pediatrics.aappublications.org/content/136/4/e974.comments>).

Gene-editing

Fast technical developments including CRISPR-CAS9 technology raise many policy questions. In January 2016 PPPC discussed which points needed priority in agenda setting. Some members attended a workshop in Amsterdam on gene-editing. The ESHG, in collaboration with ESHRE, will produce joint Recommendations on (human) Gene Editing, more particularly germ-line gene editing, including both non-reproductive/ scientific/ preclinical and possible future reproductive applications. The provisional Recommendations should be online before the Annual Congress of the American Society of Human Genetics mid October 2016, as

the PPPC will take part in a debate on Gene Editing during this Congress. Possible comments and suggestions from our American colleagues may then (in addition to the comments of the Boards and members of both the ESHG and ESHRE) be incorporated in the final Recommendations.

Exome sequencing in newborns with complex severe syndromes

The Medical Genetic branch of the European Board of Medical Genetics/Union Européenne des Médecins Spécialistes (EBMG/UEMS) discussed the need to have a guideline for “exome sequencing in newborns with complex severe syndromes”. It is their experience that in many cases a prompt diagnosis may save the life of these infants (personally I have several cases). The recommendations of ESHG in 2012-2013 may not fit perfectly in newborns at risk of life, and in four years time the possibilities of sequencing technologies have increased. Bela Melegh (PPPC-member), Alessandra Renieri, Orsetta Zuffardi and Ulf Kristoffer-son will be involved.

Members of the PPPC in 2015-2016 were Caroline Benjamin, Pascal Borry, Martina Cornel (Chair), Guido de Wert, Florence Fellmann, Francesca Forzano, Heidi Howard, Hülya Kayserili, Bela Melegh, Alvaro Mendes, Borut Peterlin, Dragica Radojkovic, Emmanuelle Rial-Sebbag, Wolf Rogowski and Maria Soller, supported by Carla van El.

EJHG Highlights of 2015

By *Gertjan van Ommen, Editor in chief, EJHG*

Impact Factor

In 2015 our Impact Factor has increased from 4.225 to 4.349. EJHG now ranks 36/167 in ‘Genetics and Heredity’ and 70/289 journals in ‘Biochemistry and Molecular Biology’. In the light of the below change in editorial policy it is our hope that the IF will further increase in the next few years.



Change in editorial policy

Due to the increased popularity of EJHG, our publication backlog – the time between the AOP (advanced online publishing) of papers and the appearance of the actual printed issue – had crept up to nearly 9 months. In 2014, at the Glasgow ESHG meeting, together with Nature we devised a multi-pronged strategy to reduce our print backlog to around 3 months. This entails on one hand a temporary increase of the published volume by 20% (so you will get fatter EJHG issues) and, on the other hand, becoming yet more stringent. The latter is of course expected to further increase the Impact Factor. A key element of the policy is decreasing the number of manuscripts sent out for review. This both reduces the burden on reviewers and allows the authors concerned a quicker submission elsewhere. This policy, already announced in last year’s report, already shows success: our publication backlog is now around 6 months and our acceptance rate fell from 37% in 2015 to 30% in 2015, mainly due to a 7% increase in editorial rejections.

Web visibility

The journal website has been viewed nearly 1.65 million times in 2015 – an increase of 7% compared to 2014 (1.54 million). This equates to an average of 4500 page views per day. Full-text articles amassed more than 1.18 million views, compared to 1.07 million in 2014 (+9%). The highest proportion of visitors to the website came from those located in the US (29%), followed by the United Kingdom (8%), China (6%), France (5%) and Canada (4%). Direct traffic to the website accounted for 20% of views, followed by the referring domain Google.com (18%) and by PubMed (11%). By far the highest viewed paper published in 2015 is “Y-chromosome descent clusters and male differential reproductive success: young lineage expansions dominate Asian pastoral nomadic populations” by Patricia Balaesque et al. with 11.500 views in 2015. This is also the highest viewed in 2015 of papers published in all years.

EJHG Award

As every year, EJHG, and Nature Publishing Group, jointly offer a junior authors’ high-citation award. This is given to the top-3 articles published in 2014, with citation counted in the 12 months following after publication. The 1st prize includes a € 500 award and positions 1-3 receive one year free ESHG membership, including an online EJHG subscription, and free registration for that year’s or next year’s meeting. In fact the prize was specifically intended meant for junior first authors submitters. However, we haven’t made this very clear, so there is also a paper by a group of senior authors which obtained 16 citations, on a par with no.2. We decided to give this paper a special award.

The winners are:

- 1. Castera, L; Krieger, S; Rousselin, A; Legros, A; Baumann, JJ et al.** Next-generation sequencing for the diagnosis of hereditary breast and ovarian cancer using genomic capture targeting multiple candidate genes. *Eur J Hum Genet.* 2014 Nov;22(11):1305-13. doi: 10.1038/ejhg.2014.16. Epub 2014 Feb 19. 31 Citations
 - 2. Glockle, N; Kohl, S; Mohr, J; Scheurenbrand, T; Sprecher, A et al.** Panel-based next generation sequencing as a reliable and efficient technique to detect mutations in unselected patients with retinal dystrophies. *Eur J Hum Genet.* 2014 Jan;22(1):99-104. doi: 10.1038/ejhg.2013.72. Epub 2013 Apr 17. 16 Citations
 - 3. Deelen, P; Menelaou, A; van Leeuwen, EM; Kanterakis, A; van Dijk, F et al.** Improved imputation quality of low-frequency and rare variants in European samples using the ‘Genome of The Netherlands’. *Eur J Hum Genet.* 2014 Nov;22(11):1321-6. doi: 10.1038/ejhg.2014.19. Epub 2014 Jun 4. 15 citations.
- (Special award) Boomsma, DI; Wijmenga, C; Slagboom, EP; Swertz, MA; Karssen, LC et al.** The Genome of the Netherlands: design, and project goals. *Eur J Hum Genet.* 2014 Feb;22(2):221-7. doi: 10.1038/ejhg.2013.118. Epub 2013 May 29. 16 citations.

EJHG-tube

Finally, this year EJHG and Nature have also a major innovation to announce:

EJHG-tube: your paper on video!

From June 2016 onwards, European Journal of Human Genetics encourages authors to include video abstracts as part of their submission. These video summaries should be included as supplementary material and are a unique way for authors to present the information in their paper and further enhance the visibility of their work. Through this video media authors can convey their findings without the constraints

of the written word, plus provide a new and enhanced user experience for readers of the journal.

When visiting international conferences like ESHG and ASHG, it struck us that even short 10' presentations often made people's actual research come alive much more. The personal emphasis adds vision and angle and enriches the science over just reading the paper. Thus, the idea was born for a new format to enhance papers published in EJHG: we will offer prospective authors of papers the opportunity to submit a 10' video presentation on their manuscript. Nothing very special or contrived: just practise a 10' conference talk (which you often will be doing for a conference anyway), have some co-authors or other colleagues listen in, and when you are happy with it switch on your iPhone, Samsung, or Android and record it. You may also interlace the narrative with stills of your slides, or even start from commented slides, but it helps seeing the presenter occasionally. Subsequently, just submit the video as a supplementary file together with your manuscript. If your paper is accepted, the video will be available for viewing online in the supplemental material. Think of this as a sort of 'EJHG-tube'. The format may evolve with time, but we expect that a live rendering of your work may increase interest and citations. Please note that submitting a video is not obligatory, and its inclusion will not impact editorial decisions. We accept the following files: .mov, .mpg, .mp3 and mp4. For more information please refer to the journal's Guide to Authors (www.nature.com/ejhg/ejhg_new_gta.pdf) from June onwards.

ESHG educational activities

By Han Brunner

The ESHG Education Committee currently comprises the following Activities:

ESHG Educational Courses, ESHG DNA day, ESHG School Children Event, ESHG taskforce on Educational materials. An additional activity on understanding and proper use of HGVS nomenclature will be proposed for endorsement by the ESHG Board in Barcelona.



ESHG Educational Courses: Han Brunner

The following courses have been scheduled for 2016:

Spring Course in Hereditary Cancer Genetics (80 participants, sold out); Preconception, Preimplantation & Prenatal Testing (95 participants); Manchester Dysmorphology Course; European Course on Cardiogenetics; Basic & Advanced Course in Genetic Counseling; Next Generation Sequencing (60 participants, sold out); Medical Genetics; Basics in Human Genetic Diagnostics; Introduction to the statistical analysis of GWAS; Clinical Cytogenetics.

ESHG DNA day: Christophe Cordier

The questions for this year were as follows:

1. Choose a genetic test for a condition or disease that does not cause symptoms until adulthood (i.e., an adult-onset condition such as hereditary breast cancer). Describe how the test works and how certain the test results are. Then, either defend or refute the recommendation from ESHG on "Genetic testing in asymptomatic minors", or

2. Do you agree that the collection of biological samples from entire populations in large biobank facilities is a good idea to better understand the link between genomic markers and correct prevention/curative treatment? Is this the future of personalized medicine?

In total 189 essays were received from 19 countries. Topscoring countries are: Turkey: 49, France: 30, Italy: 23, Georgia: 20, Cyprus, Lithuania, Portugal: 10.

As many as 60 ESHG members have volunteered to assist with judging these essays.

The winners will be announced at the Barcelona meeting. This year (for the first time) the winner is a student from Romania. The runner ups are from Italy. Another 5 students received honorary mentions. Their pictures and essays can be found on www.dnaday.eu.

ESHG taskforce on Identification of Accessible Educational Resources: Jill Clayton-Smith

It was agreed that in this current era of rapid advances on genomic technologies, there is a pressing need for further education of the broader genomics workforce, both clinical and scientific, and particularly of healthcare workers in mainstream specialties. Lay groups and patients, too are seeking further information on genomic testing, so that they can be helped to make informed decisions regarding newer genetic tests including whole genome sequencing. To this end our ad hoc committee has started work on compiling a directory of educational resources, concentrating in particular on those which are freely accessible on-line.

The resources identified so far range from simple written materials, PowerPoint presentations and video-animations through to longer courses and MOOCs. (Massive On-line Open Courses). Each resource has been listed, along with the link to the website, and accompanied by a brief description. Accessibility has been checked to make sure that links are currently active. The resources have been categorized according to topic, with some comments as to who might find the resource of most use, and a comment on quality. Where resources have not been considered of sufficiently good quality they have been reviewed and omitted.

Johan den Dunnen has recently agreed to take this forward with Jill Clayton-Smith. The directory currently takes the form a Google-Doc and ultimately needs to be formatted for the ESHG website. There is an increasing number of good resources available and we will soon be at the stage when we have adequate coverage of most topics. The aim is to complete this later in 2016.

ESHG School Event: Domenico Coviello

The ESHG School Event 2016 is organized in Barcelona by the AEGH local organizers Cristina Gonzalez, Conchi Lazaro, Ignacio Blanco, and Teresa Perucho, with the help of Domenico Coviello who is the linking pin with the Education Committee, and helps provide continuity over the years. The program will have an introductory lecture on Genetics in Art, History and in our times by Teresa Perucho, Workshops on Cytogenetics, Genetic Counseling, and Forensic Genetics, and a final lecture on Genetics in the Future by Manel Esteller. There will be about 90 students (ages 16-17) from different high schools, all of them very interested in science and genetics. The most interested (about 20-30) will come to visit the poster session in the conference on Saturday.

Annual Report from the European Board of Medical Genetics - May 2016

by Heather Skirton, Chair of the EBMG

During the year we have consolidated much of the initial work in setting up an online registration system for both the Clinical Laboratory Genetics and Genetic Nurse and Genetic Counsellor Branches. Members of both these branches received and assessed a number of applications this year. All those practitioners currently registered with the EBMG are listed on the webpages.



In addition, the Medical Genetic Branch has progressed the work in defining the curriculum for specialist training in medical genetics. A memorandum of understanding was agreed between the EBMG and UEMS Clinical Genetics Branch, to clarify roles and enhance communication between the two groups involving medical doctors.

The work of each branch is described in more detail below.

Clinical Laboratory Genetics Branch

Chair

Thomas Liehr – Germany. Co-Chair Isabel Carreira - Portugal

Members

- Dilek Aktas - Turkey
- Egbert Bakker - The Netherlands
- Marta Rodríguez de Alba - Spain
- Domenico Coviello - Italy
- Lina Florentin - Greece
- Martina Rincic - Croatia
- Hans Scheffer - The Netherlands

During the past year the online system for submission of registration applications has been designed and launched. This has made the submission and assessment system more straightforward for both applicants and assessors. As with any new IT system, there have been some small hitches and these have been addressed.

Results of the registration applications for the 2015/2016 round. A total of 63 people applied for Clinical Laboratory Geneticist registration, of these 40, from Group 1 or 2 countries, have been already approved. A total of 12 persons were not assessed as meeting the requirements. A further 10 were from Group 3 countries and are required to do a written exam to test theoretical knowledge and an individual oral discussion to assess experience in diagnostics before they can be approved. The examination will take place in Barcelona in May.

Genetic Nurse and Genetics Counsellor Branch

Chair: Milena Paneque - Portugal

Deputy Chairs: Ramona Moldovan – Romania and Christophe Cordier - France

Members

- Inga Bjernevoll - Norway
- Irene Feroce - Italy
- Debby Lambert - Ireland
- Clara Serra - Spain
- Heather Skirton - United Kingdom
- Sara Pabalodos – United Kingdom
- Emmanuelle Haquet – France.

We are happy to announce that two new members were invited to join the Branch Board, Sara Pabalodos (UK) and Emmanuelle Hacquet (France). The board had a very busy year of activities, mainly because international reciprocity agreements with three countries were established. The UK, US, Australian, Canadian and South African Boards now all have reciprocity agreements with our European registration system, so that professionals already certificated by those systems who have worked for a minimum of one year in Europe can apply for registration under the national route.

The Board also started developing a new route for genetic counsellors and nurses working outside Europe, named the Associate Register, which will certificate professionals who fulfil the European competence standards. More news of these developments on our website (<https://www.eshg.org/471.0.html>).

Additionally, the registration process was run for a third year. We received a total of 21 notifications of intention to register. Most applicants applied using the grandfather clause, which still open as a registration route till 2018 for countries with approved MSc programs. However, we extended the opportunity to use the grandfather clause until 2020 for applicants in countries where there are no current Masters degrees for genetic counsellor education. From the initial 21 intentions, 19 were assessed as eligible and 17 full applications were received. As usually, the members of the GC & GN Professional Branch Board met for final agreement on the evaluation of all applications and as a result there are 11 new registered nurses or genetic counsellors (other 5 pending for minor revisions). We congratulate those professionals who have successfully registered this year.

We have now 50 European registered GC & GN from 13 countries. We would like to thank all the registered GC & GN for supporting the process of professional regulation of genetic counselling in Europe.

Medical Genetics Branch

Chairs

Ulf Kristoffersson - Sweden and Bela Melegh – Hungary

Members

- Kristiina Aittomaki - Finland
- Beata Lipska - Poland
- Feliciano Ramos - Spain
- Alessandra Reineri - Italy
- Peter Turnpenny - United Kingdom

The Medical Genetics Branch has worked closely with the relevant section (now called Clinical Genetics) of the Union of European Medical Specialties (UEMS). Ulf Kristoffersson continued to Chair the EBMG Medical Genetics Branch (until May 2016), while Bela Melegh took over as President of the UEMS section.

The preparation of curriculum, syllabus and European training requirements for clinical genetics was undertaken by collaboration between the EBMG Medical Branch and the UEMS Section.

Thanks

My thanks to all members of the Executive, especially Domenico Coviello (Secretary) and Bert Bakker (Treasurer), those who serve on the branch boards, and Jerome del Picchia, Kristina Libova and other members of the team at Vienna Medical Academy, for their unswerving support.

All documentation, guidance and activities of the EBMG can be found at the EBMG website [<https://www.eshg.org/413.0.html>].

Heather Skirton
Chair of the EBMG

Annual Report of the ESHG-Eurogentest Committee 2015-2016

by Hans Scheffer

The ESHG-Eurogentest committee (EUGT) is the committee dealing with aspects of diagnostic laboratories and services in genetics. Apart from own initiatives and activities EUGT tries to interact with the many international stakeholders in this field. EUGT has four subcommittees:

- (1) The Quality subcommittee
- (2) The Guidelines committee
- (3) The Training Committee
- (4) The Dissemination Committee



For EUGT 2015-2016 has been a year of transition. EUGT has been a EU-financed (Framework 6 & 7) project for many years, initiated by Prof. Jean-Jacques Cassiman and continued by Prof. Gert Matthijs. EUGT is a strong brand name. EUGT is now integrating its activities with other ESHG activities. These activities sometimes overlap, e.g. educational and training activities cover similar topics but are dealt with from a different angle. So one of the aims for this and next year has been (1) to make activities coherent and (2) self-sustainable.

With regards to aim (1) the different subcommittees have started to interact with several stakeholders within and outside the ESHG, e.g. the liaison between ESHG-EUGT and GA4GH. For details see the summaries of the subcommittees below.

The Quality committee has prepared an action plan. In short, they interacted with several external quality assessment scheme providers including EMQN, CEQAS, ERNDIM, UK-NEQAS, CF Network, and others. Their action plan includes the following issues: (a) EQA and how to deal with poor performance, i.e. EQA providers will be requested to provide an explanation and further feedback if the percentage of poor performance is greater than 10%; (b) How to deal with persistent poor performing laboratories and how to organize a governance structure. Possibly national societies or even the ESHG could play a role in this; (c) quality control in genetic counselling, and (d) quality issues relating to newborn screening (a survey of pre-test screening via national contacts has been planned).

The Guideline committee discussed the different types of existing

guidelines and their different purposes. The conclusion was that practical guidelines and policy documents have been issued that serve different purposes. For policy documents close collaboration with PPC will be sought. In January a joined meeting has taken place on genome editing. Another priority identified is the development of informed consent guidelines (with PPC). Initiatives have been taken to start on an update for OECD guidelines. Several practical guidelines need updates, e.g. CF, breast cancer, SMA. For the development of guidelines a working group and an expert meeting are mandatory. Guidelines should be endorsed by PPC/ESHG, and if possible published, preferably in the EJHG.

The Training committee initiated plans to develop on line training tools e.g. on bioinformatic data interpretation. An issue here is overlapping activities with the ESHG Educational committee. A possibility would be to join forces.

The Dissemination committee has begun to update and revise the web resource of EUGT. We have made several updates to the website, announcing novel events, guidelines, resources and information availability. A start was made to increase our visibility on social networks, predominantly using Twitter to disseminate most recent announcements on the news and information associated with EUGT. In 2015 EUGT successfully organized (in collaboration with 3Gb-TEST) a Satellite meeting in Glasgow entitled: From genetic testing to genome diagnostics: quality, clinical utility and counselling issues, which attracted more than 60 participants. This year again a satellite meeting has been organized, to be held during the current ESHG meeting in Barcelona.

A start has been made to make EUGT self-sustainable (with a limited ESHG support). One of the strategies that has been pursued during this year has been to get ESHG-EUGT involved as formal partner with a budget in research projects. EUGT would then be the partner dealing with quality aspects in diagnostic applications. This strategy has a longer term horizon, however in a few project proposals in preparation EUGT is currently involved. Strategies to have some EUGT activities sponsored or paid for on a subscription basis have been discussed.

EUGT recently published guidelines for diagnostic next generation sequencing:

Gert Matthijs, Erika Souche, Mariëlle Alders, Annie Corveleyn, Sebastian Eck, Ilse Feenstra, Valérie Race, Erik Sistermans, Marc Sturm, Marjan Weiss, Helger Yntema, Egbert Bakker, Hans Scheffer and Peter Bauer (2016) Guidelines for diagnostic next-generation sequencing, *European Journal of Human Genetics* 24, p.2-5

International Federation of Human Genetics Societies: What is it and why?

Greetings from ICHG in Kyoto

by *Helena Kääriäinen, President of the IFHGS*

The International Federation of Human Genetics Societies (IFHGS) was founded about 20 years ago to facilitate communication throughout the international community of human geneticists. The Federation has somewhat complicated categories of membership. The Full Members of the Federation are the multi-

national societies, namely the European Society of Human Genetics (ESHG), the American Society of Human Genetics (ASHG), the Latin American Network of Human Genetics Societies (RELAGH), the African Society of Human Genetics (AfSHG) and the Human Genetics Society of Australasia (HGSA). Relating to Asia, there are two big societies namely the Asia-Pacific Society of Human Genetics (APSHG) and the East Asian Union of Human Genetics Societies (EAUHGS). National human genetics societies can be corresponding members of the IFHGS. Affiliate membership is for organizations that are specific to one specialty (such as genetic counselors or gene therapy).

The purpose of the IFHGS is stated in its bylaws as follows: "The purpose of The International Federation of Human Genetics Societies (the Federation) is to provide a forum for organized groups dedicated to all aspects of human genetics, including research, clinical practice, and professional and lay education. The Federation will enable communication between its member groups and encourage interaction between workers in genetics fields and in related sciences and will make itself available to promote meetings and publications and other forums which support human genetics research and practice." The ways to achieve all this are facilitating communication among the member societies, developing a consensus of these organizations on policy matters of international concern and transmitting policy statements and opinions to appropriate parties and organizations.

The main tool to facilitate international communication between human geneticists has been to support organizing International Congresses of Human Genetics (ICHG) every five years. The latest was the 13th and it took place in Kyoto early April 2016 when the cherries were in full blossom. The Congress was a great success with over 3100 participants from 70 countries, about 40% of them coming outside of Japan. The program was full of interesting, very up-to-date scientific presentations. From IFHGS's point of view it was especially important that there were tens of sessions and workshops which specifically focused on international collaboration and the need to share and to learn from each other's experiences.

It is true that in many ways, especially relating to applications of genetics to health care, Europe, North-America and Australia (and some others) are ahead of most parts of the world. On the other hand, relating to developing and using new techniques, the map is not as simple as places like Japan, China and Singapore, to name some, are clearly among those in the front line. And finally, it could be argued that the tradition of offering as perfect as possible services like comprehensive pre-test counselling for even simple diagnostic tests is becoming a burden in the western way of practicing human genetics as it disallows or at least slows down new innovative approaches which seem to be budding in the less advanced health care systems, according to the presentations in ICHG in Kyoto. So



there is no simple one direction that some countries should teach the others how to do genetics but a true need for all of us to learn from each other.

As a Federation, IFHGS has many challenges to be solved. Firstly, there are big areas on the world map where genetics colleagues do not easily identify themselves as part of any of the multinational human genetics societies, maybe India and its neighboring countries being the most prominent example but similarly the big genetics communities in for example Iran or Kazakstan. How could they be better represented in IFHGS? Should the bylaws be changed?

Another challenge is that while the International Congresses, as based on the example of Kyoto, seem to be doing very well, the other tasks of IFHGS like developing a consensus on policy matters of international concern and transmitting policy statements to appropriate parties have been neglected.

The Federation's presidency rotates between the Full Member Societies on a three-year cycle. At present, ESHG has the presidency and I have the interesting task to serve as the President. I know that there are many members in ESHG who are actively involved in international and global affairs, like the questions of data sharing, support programs between countries etc. I would be very grateful to hear their experiences and ideas to be discussed and worked on in IFHGS.

Data Sharing and the Right of Citizens to Benefit from Scientific Advances

by *Bartha Maria Knoppers*

A transformative approach to data sharing is being promoted by the Global Alliance for Genomics and Health (GA4GH). Rather than emphasizing protection from possible, hypothetical or presumed data breach harms, the GA4GH founds its work on the human right of citizens to benefit from scientific progress. This human right first expressed in article 27 of the Universal Declaration of Human Rights in 1948 was made legally binding in 164 states in 1966 via the International Covenant on Economic, Social and Cultural Rights. Yet, this right has never been explicitly incorporated as such neither in international bioethics declarations which largely concentrate on protection from possible research harms nor in the laws of the 164 countries that signed and ratified the Covenant.



What would such a legally actionable right look like in practice? To answer that question, we must first understand the mission of the GA4GH before turning to an explanation of the policies and tools it is building to activate this right.

I. Mission of GA4GH

The origins of the GA4GH trace to January 2013, when 50 colleagues from eight countries met to discuss the current challenges and opportunities in genomic research and medicine. They discussed how their groups could work together to accelerate medical progress, building on the experience and best practices of genetics programs around the world. By 2016, the Alliance has grown to include over 400 academic institutions and other organizations including IT and pharma companies from 44 countries. In April 2016, the GA4GH counted 667 individual members from 56 countries.

There are four GA4GH working groups (Clinical Working Group; Data Working Group; Regulatory and Ethics Working Group (REWG); Security Working Group) and over 30 Task Teams (all volunteers) across the GA4GH.

While human rights such as the right to privacy, or protection from discrimination have long been discussed in relation to research and clinical care and certainly are issues discussed in data-intensive science - the focus of GA4GH, what policies and tools are being developed so as to catalyze the right to benefit from scientific advances?

II. Policies and Tools

First of all, the GA4GH Framework for Responsible Sharing of Genomic and Health-Related Data outlines the principles and procedures for realizing this right in 12 languages for use by researchers and clinicians around the world.

Second, REWG policies flesh out possible uses of the Framework in practice. Currently, these include a Consent Policy, a Privacy and Security Policy, and, an Accountability Policy. All are unique in that they address problematic issues. For example, the Consent Policy includes consideration of the issue of access to legacy samples and data that currently may be limited due to narrow disease-specific research or where transborder data sharing is not explicitly mentioned. The Privacy Policy promotes a more proportionate approach to the evaluation of the risks and benefits of data sharing in contrast to pressuring that all research is high risk interventionist clinical research. The Accountability Policy engages stakeholders whether funders, publishers, researchers or institutions concerning compliance issues. But, it also asks data stewards holding data or samples consented for sharing: "Why are you not sharing?"

Policies in and of themselves are not sufficient. The different Demonstration Projects of the GA4GH require specific ethico-legal tools to make them interoperable across global political and legal barriers. To that end, various Task Teams have been set up by the REWG to look at for example, the liability of variant databases such as the proposed BRCA exchange, or, build a data sharing lexicon useful for data transfer agreements, or, to examine the issue of re-identifiability.

New concepts are under construction such as the creation of registered access that is, an intermediary tier between open and controlled access databases. Criteria are being developed for mutual recognition of equivalency in principles and procedures between research ethics boards located in different countries or within countries. Data intensive research also raises novel issues especially when clinical data are linked to genomic databases in the cloud. Multidisciplinary Task Teams are built to address these issues and others as they arise and then end when their work is finished. This epigenetic and dynamic system of over 800 active

volunteers is sufficiently grounded in global diversity through its members to be able to both confront and respect socio-cultural and legal diversity.

As research moves to translational medicine and as data sharing increasingly relies on storing and computing in the clouds in real time, the building of this new model requires more support from governments not just as a return on their investment in scientific research but as a recognition of the "health" rights of their citizens.

European Reference Networks: from concept to reality

Victoria Hedley, RD-ACTION Thematic Coordinator

2016 will mark a major watershed for cross-border healthcare in Europe, as the year in which European Reference Networks (ERNs) evolved from concept to reality. In the five years since the publication of the Directive on the Application of Patients' rights in cross-border healthcare (Directive 2011/24/EU) the concept of an ERN -embedded in Article 12 of the aforementioned Directive- has slowly but surely taken shape, bringing European Member States closer to collaboration and innovation in often-neglected disease domains.

What are ERNs?

An ERN is -or will be- a network connecting providers of highly specialised healthcare, for the purposes of improving access to diagnosis, treatment and high-quality care for patients with conditions requiring a particular concentration of resources or expertise. In domains such as rare diseases and rare cancers, for instance, where the numbers of patients with any single condition are, by definition, small, and expertise is correspondingly scarce and fragmented, there is a particular advantage to cross-border collaboration; indeed, often a necessity, for in the case of very rare conditions or highly specialised thematic interventions, no single centre in any European MS would be able to reach the 'critical mass' of patients needed to truly push the frontiers of knowledge and research.

Membership of each ERN will, of necessity, be limited to the healthcare providers (HCPs) able to demonstrate the highest levels of care and research excellence. As a minimum, each ERN must unite at least 10 HCPs in at least 8 Member States, but in reality many will be considerably larger. Crucially however, the ERNs will need to ensure accessibility of their expertise to non-member HCPs, which will be enabled in part through the nomination of affiliated providers in each Member State.

How will ERNs create added-value?

ERNs are envisaged to formalise and strengthen the networking infrastructures already in place in field such as rare diseases, which in many cases are the fruits of past investment from the European Commission and the Member States; however, the scale of the future ERNs will be far broader, with a goal of ensuring, over time, that all rare diseases will 'find a home'. For the professionals and patients whose conditions do not have robust networking infrastructure at present, the ERNs will be a gateway to access the most relevant possible expertise for these diseases.

ERNs are first and foremost dedicated to care. Once established, and connected by a dedicated IT platform, the Networks will sup-

port the exchange of knowledge and expertise between healthcare providers operating at the top of their game. It is important to emphasise that wherever possible (and appropriate), expertise will travel rather than the patients themselves. In practice, this will entail a significant degree of virtual healthcare provision: ERNs will be particularly beneficial, for instance, in complex cases where a referring clinician wishes to seek advice on diagnosing a patient, determining the optimum course of treatment or management for a patient's particular phenotype, assessing suitability for highly specialised surgery – each of these scenarios could warrant consultation with additional experts (either in real-time via a live 'tele-consultation' or by uploading notes, scans, test results etc. to a secure platform, for review). In facilitating such innovative approaches to care, ERNs should reduce the inequalities currently facing rare disease patients across the EU, whose chances of receiving an accurate diagnosis and the best possible healthcare often depend upon having the good fortune to live within reach of a centre of expertise for their particular condition.

Innovations and expectations

ERNs, whilst focusing primarily upon care, are expected to nonetheless generate added value in many other areas, by conducting research, generating and disseminating clinical practice guidelines, and promoting training and education. These are ambitious goals, and expectations are high, but the ERN concept holds huge potential. ERNs should give greater visibility than ever before to expertise in fields such as rare diseases – besides the European-level networking, the hope is that ERNs will also strengthen national networking in areas requiring a specific concentration of resources or expertise, making it easier than ever to find the right specialist and to reduce the diagnostic odyssey which, for many afflicted with a rare condition, remains too long.

The potential to further research, on many levels, is also substantial: assuming the appropriate tools and resources are in place, ERNs set-up along thematic disease lines offer unparalleled opportunities for the routine collection and -with appropriate consent and anonymization- pooling and re-use of data for epidemiology, clinical research, post-marketing surveillance and more. Stakeholders are excited by the prospects of facilitated data-linkage, cross-border genetic testing, cutting-edge diagnostics, and therapy development.

The Road Ahead

The deadline for the first call for ERNs is June 21st. All across Europe, consortia are uniting to propose collaborative (as opposed to competitive) Network proposals – no easy feat, given the broad scope of these thematic networks (the recommended model includes such Groupings as rare metabolic disorders, rare renal, rare skin, etc). Once proposals are submitted, the assessment process will last for much of the remainder of this year, but the first ERNs should be officially approved by the end of 2016. Central to their success will be the integration of patients and their representatives at all levels of the Networks' functioning: Rare Diseases Europe (EURORDIS) has championed the concept of ERNs for a decade and is forging ever-stronger links with the expert clinical communities, to ensure meaningful patient participation. EURORDIS also partners with our team at Newcastle University working on the Joint Action for Rare Diseases, which continues to support the rare disease field in implementing robust ERNs. The road to ERNs has been long, and the road to mature, fully-operational Networks will of course be longer still - but each step is a step closer to a new era of collaboration across-borders for the benefit of tens of millions of European citizens.

For further information, the official European Commission website is very useful: http://ec.europa.eu/health/ern/policy/index_en.htm

ESHG NEWS

On March 23 ESHG Education Committee Chair Han Brunner and Scientific Committee Co-Chair Joris Veltman, both distinguished ESHG Members were awarded with the 2016 King Faisal International Prize for Medicine in Riyadh for the „Clinical Application of Next Generation Sequencing“ based on the nomination of former ESHG president Milan Macek Jr.



ESHG Course Programme 2016

The ESHG has expanded its course portfolio. More information on course programme, downloads etc. can be found at www.eshg.org/courses.0.html

The following courses are scheduled for 2016:

Basics in Human Genetic Diagnostics

Nicosia, CY, June 20-25

Course Organiser: Thomas Liehr, Jena

Introduction to the statistical analysis of GWAS

London, UK, July 4-8,

Organiser: Inga Prokopenko, London

Clinical Cytogenetics

Goldrain, IT, August 27 - September 3

Organiser: Albert Schinzel, CH

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Invitation to the

**Annual Membership Meeting 2016
at the EUROPEAN HUMAN GENETICS CONFERENCE 2016**

**Sunday, May 22, 2016 at 19.15 – 20.15 p.m.
ESHG Conference venue: CCIB, Barcelona, Spain
Room 118+119**

AGENDA

- 1. Opening by the President of the Society, Professor Feliciano Ramos**
- 2. Activity of the Society 2015-2016**
- 3. Financial Report of the Society 2015**
- 4. Discharge of the Board Members for the year 2015-2016**
- 5. Opening by the new President of the Society, Professor Olaf Riess**
- 6. Results of election for President-Elect**
- 7. Results of election for Board Members**
- 8. Membership fees 2017**
- 9. New Membership Categories 2017**
- 10. Site of future European Human Genetics Conferences**
- 11. Budget proposal 2017**
- 12. Major policy questions proposed by Board**
- 13. Future activities**

Please find the minutes of the last membership meeting in Glasgow 2015 in the restricted member area of the website: <https://www.eshg.org/members.0.html>