



European Society of Human Genetics

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Communicating genetics



Veronica van Heyningen

Genetics - and particularly human genetics - is constantly in the news these days. While this is gratifying at one level to those of us who work in the field, I am sure that many of us have at times felt threatened by the double-edged sword created by the high level of media and public interest in the fast accumulating volume of genetic information. Adverse responses to reported new developments often arise because the findings are over-sold or at least over-simplified - sometimes by the media, but frequently by the scientists

themselves. Clearly negative public attitudes must be heeded by policy makers, even if they arise as a result of failures in communication. How can we improve this situation? The answer is, of course, better quality public dialogue which must be underpinned by improved presentation of the complexities and the realities of genetics and biology to a much broader spectrum of people.

Genetics is complicated and, as with mathematics, physics and languages, acquiring some basic knowledge early in life should make later understanding of new ideas much easier. So introducing widespread and better teaching of the major concepts at an early stage, perhaps at primary school, but certainly by the age of 13 or 14, should help considerably. One of the exciting findings emerging from the many genome projects undertaken around the world, is the amazing extent of the evolutionary conservation of many basic biological pathways, such as cell cycle control, cell death, biological clocks, meiotic and mitotic mechanisms and many aspects of general metabolism. Mendel's laws of course also provide a unifying theme. It is therefore quite possible to teach general genetics at the practical level, using plants (packets of unmodified parental and F1 seeds could be supplied by Monsanto!), or using *Drosophila* with more dextrous older students. In the early 1960s at my school - an English comprehensive (ie not fee-paying or grand) - we bred red and white-eyed flies and vestigial-winged flies, aged 14, using a cupboard with a light bulb for temperature control. It would be wonderful if practising geneticists, scientists and clinicians and perhaps vets and farmers too, could become engaged in these projects. Establishing regular contact with schools in your area can be very rewarding and can provide additional opportunities to discuss newly reported developments with teachers and pupils, as well as perhaps parents. Face-to-face discussions and repeated attempts to develop better ways to explain complex new findings should help us to come up with improved explanations and metaphors.

Equipping the next generation with better basic understanding of the complexities of genetics is only one step to bridging the communication gap. A more pernicious problem, perhaps, is the exaggeration of both the dangers (bar-coding babies, creation of a genetic underclass) and the

potential benefits (gene therapy, designer babies), of ongoing genetics research. Wider-ranging and less pressured interactions with the media will improve this, but, it seems to me that the major problem lies with scientists themselves giving unrealistic estimates of what their current work can achieve and how fast. Recent expectations that science should be used directly to solve practical problems has had many wonderful spin-offs and has led to faster emergence of solutions in many cases, but it can also lead to corner cutting and unrealistic estimates on how long it takes to reach the ultimate goals.

Human genetics at the dawn of the 21st century is an exciting area to be engaged in. The unique combination of detailed phenotypic and molecular analysis becoming feasible in modern medicine, holds tremendous promise for undreamt-of progress. Humans provide a wonderful model system, to be used in combination with all the other available models, whose validity has been so well supported by recent evolutionary genomic analysis. In the broadest terms, genetics has become a tool for biological discovery. It may be useful to develop ways to explain and illustrate that disrupting a smoothly running machine by "dropping a spanner in the works" is a good way to explore how the machine is put together and how it functions. This is why making mutant cells and organisms is such a widely used approach to understanding normal biology and why expanding and exploiting our insight into how things go wrong in human disease is essential for the development of new ways of disease management and novel therapeutic approaches. This is why we need to have access to many human DNA and tissue samples.

Most common diseases have a genetic component, although often environmental factors are more important; but gene activity is involved in all biological processes. To simplify the genetics of common diseases, it helps to use many separate single gene Mendelian models to build up a fuller picture of molecular pathways and interactions. We are still at this simplification stage with complex conditions, including novel areas such as ageing, nutrition, and drug responses. Results are beginning to emerge from the analysis of some smaller isolated populations with fewer segregating variants. However, our understanding of the underlying mechanisms of biological variation is itself still evolving. DNA coding sequence variation is by no means the only answer. Regulatory element mutations, altered chromatin organisation and epigenetic changes are all thought to contribute and interactions with the variable environment make the whole picture extremely complex. The good news is that many of these less clear-cut variables may be much more amenable to clinical and lifestyle intervention than DNA changes. Progress will be slow and it is not a foregone conclusion that we shall ever be able to use genetic profiles to predict predisposition to heart disease or asthma or schizophrenia, since there may be a large number of genes involved, each with very small effect. But by learning more about the broader biological picture, we open up novel avenues for managing and improving the human condition. As human geneticists, we should strive to communicate to as many people as possible, and as clearly as possible, our growing insight into how genes work, and convey our cautious, but great optimism for the future.

Veronica van Heyningen
October 2003

HUMAN GENETICS IN SPAIN

The Country

The Hispanic peninsula lies at the extreme south western tip of Europe, in the direction of Africa and the outer Atlantic. It is partially separated from the rest of Europe by the Pyrenees and forms a geographic stepping stone between that continent and Africa. Despite its unique location, the peninsula does not form a fully unified geographic entity and is divided by steep internal mountain ranges and in some regions by virtual deserts. Hispania, the name given by the Romans to the peninsula, was a strictly geographic label without specific cultural or political connotation. The peninsula had always been divided into geographic and ethno-cultural regions, which differed greatly from each other. The most advanced of the ancient Hispanic communities was the kingdom of Tartessos in the south, covering roughly the modern region of western Andalusia. The largest ethnic group in the peninsula, the Iberians, was strongly tribal and warlike. Celtic immigration spread through much of the northern part of the peninsula during the eighth and ninth centuries B.C. The strategic geographical location of the Iberian peninsula - a bridge between Europe and Africa - was the motive that the original native inhabitants, Tartessians, Iberians and Celts were invaded chronologically by the Phoenicians, the Greeks, the Carthaginians, the Romans, the Vandales, the Bizantines, the Visigodes and the Moors. This determined the unique character of Spain with 17 regions having their own Parliaments (Autonomous Communities). It has a total area of 506.000 Km² and almost 40 million inhabitants (around 80 people/Km²). Only 15% of the population live in rural areas. The majority of the population live in areas with more than 10,000 inhabitants and approximately 20% live in small populations. Spanish are European in origin with a distinct ethnic group, the Gypsies, who constitute approximately 1.5% of the population.



During latter years, an important number of immigrants from the North of Africa and Latin-American countries have settled down in Spain. In some small regions, almost 10% of the inhabitants are recent immigrants. Besides its social consequences, this will notably impact issues about health care, prevention of diseases and genetic background.

The Health Service

The organisation of Health Care in Spain is based on the General Health Law, which was passed in 1986, regulating the National Health Service (NHS) by integrating different public institutions and agencies. During the last decade, the NHS has been decentralised and health competencies have been transferred to the 17 autonomous communities operating through their own Regional Health Services.

The Spanish health system is currently financed largely by general taxation (80%) and specific social security contributions (20%). Since health financing has been decentralised, the autonomous regions manage approximately half of the health care budget. The public sector covers most outpatient health care, and runs over 80% of all hospital beds in the country.

Evolution of Medical Genetics

The incorporation of genetic services into medicine in Spain can be dated to the middle of the 1960s, when some health centres began to perform cytogenetic tests, principally aimed at diagnosing congenital defects and haematological disorders. In 1977, the National Plan for the Prevention of Handicap was drawn under the Royal Patronage of Her Majesty, Queen Sofia. The plan had two main goals: to implement a national screening programme for phenylketonuria (PKU) and hypothyroidism and to consolidate the existing genetic units/centres, that were partially financed to extend their coverage of genetic services. Since then, the development of genetic services has been a continuous process, although lacking strategic planning. Most units/centres initially emerged as a sub-specialty of other medical fields (e.g., obstetrics, paediatrics, clinical pathology, and haematology) given the personal interest of individual professionals. The increasing demand during the last year has greatly contributed to consolidating the existing units/centres and also to the differentiation of services, in many cases from the original medical speciality.



In all Spanish regions genetic services are basically provided by the large hospitals in the public health sector (third level). As is the case for other health services, the corresponding costs are mainly covered by the National or Regional Health Services. In the last decade, however, research grants funded by national, regional or local sources, mainly the Instituto de Salud Carlos III through the Fondo de Investigación Sanitaria, have played an important role in the technological development of genetic units and networks among different groups. It can be said that this has contributed greatly to implementing molecular genetic techniques and their application to the diagnosis of genetic diseases.



There are currently more than 50 genetic units/centres performing diagnosis. This does not include centres basically concerned with research. The personnel of these units/centres include over 200 genetically trained graduates (approximately half of them are physicians) and 250 technicians or laboratory auxiliaries. About 100 students supported by research grants collaborate in diagnostic tasks as part of their genetic training. Practically all units/centres provide genetic counselling services and the vast majority perform cytogenetic analysis for prenatal diagnosis. During the last year, a considerable number of Centres have expanded their tasks and provide molecular diagnosis for most of the common hereditary diseases. Cancer genetics formerly restricted to the diagnosis and prognosis of haematological disorders has been expanded mainly with the incorporation of molecular genetics of breast and colon cancers.

There is a good relationship between genetic centres, mainly because of the public social security system that financially covers a large part of the genetic testing, allowing them to establish labour relationships without the limitations imposed by specific payment for each analysis.

The development of genetic Services or Departments has not yet been sufficiently planned at a central level mainly because there is not official recognition of the speciality. As a consequence, there is also no official authorisation of laboratories to perform diagnostic genetic tests. However, gradually many molecular genetic laboratories have joined several quality assessment schemes for genetic disorders organised by EMQN and the UK NEQAS in Clinical Cytogenetics.

Spain has one main professional organisation in human genetics: the Spanish Association of Human Genetics (Asociación Española de Genética Humana or AEGH) that is a non lucrative Scientific Corporation founded in 1974, with more than 400 physicians, biologists, pharmacists, and biochemists devoted to human genetics as members.

There are five main tasks of this association:

1. To organise an annual meeting and a National Congress every two years (last was the 22nd Congress in Zaragoza, June 2003).
2. Support of Courses and Educational activities.
3. A National Register of Centers and professionals involved in Human Genetics.
4. To give a Normalised Accreditation to those eligible members working in the field of human genetics.
5. To cooperate with diverse authorities to claim the recognition of Human Genetics as a health speciality.

There are several other organisations that also include professionals in human genetics such as The Spanish Association of Prenatal Diagnosis; The Spanish Association of Chemistry; The Spanish Association of Pediatrics (Genetics and Dysmorphology section); The Spanish Association of Genetics (Human Genetics section) and The Spanish Association of Inborn Errors of Metabolism. There is a general agreement among human geneticists that genetic centres must provide appropriate genetic counselling and diagnosis.

Prospects

The most detrimental factor in the development of the genetic field in Spain has been the lack of the official recognition of human/medical genetics as a speciality. The training of new professionals and their access to employment have been extremely difficult. The progress of genetics in Spain has been largely attributable to the interest and motivation of certain scientists who have been able to obtain funding, mainly through research grants, for implementing genetic services and new diagnostic technology. The recent Normalised Accreditation on Human Genetics, granted by the AEGH, is a very important step towards the official recognition of professionals devoted to this discipline.

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Eduardo Tizzano, MD, PhD. Member of the Board of the ESHG.
 The author is indebted to Dr. Montserrat Baiget and Dr. Isabel Tejada, previous and actual President of the AEGH respectively, for their comments and information in the preparation of the text.



Welcome to the President-Elect and new Board Members

President-Elect

Professor Leena Peltonen (Helsinki, Finland) was nominated and approved as the next President-Elect at the European Human Genetics Conference in Birmingham in May 2003.

New Board Members were also elected as follows:



Dr Alexis Brice (Paris, France)



Dr Nicolas Levy (Marseille, France)



Gert Matthijs, (Leuven, Belgium)

Gert Matthijs, (Leuven, Belgium) PhD, (1963) is a molecular geneticist and the Head of the Laboratory for Molecular Diagnostics at the Center for Human Genetics in Leuven. The Center is the largest genetic department in Belgium, and the DNA laboratory alone is analysing more than 6000 samples per year. He is a part-time professor at the University of Leuven, Faculty of Medicine, teaching human genetics.

His research is in the field of Congenital Disorders of Glycosylation (CDG), an emerging group of rare inborn errors of metabolism. He is coordinating a European Project, EUROGLYCAN, which is focussing on the identification of novel defects and the generation of mouse models for CDG. The project further aims at early diagnosis and the development of therapies for these defects. From his position at the interface between molecular diagnostics and research into inborn errors of metabolism, he notices that there is more molecular genetics in the "metabolic" congresses than there was interest and attention towards metabolic diseases in the recent meetings of the European - and the American - Societies of Human Genetics. It may be a challenge for the coming years to re-integrate this original discipline of genetics.

At the national level, Gert Matthijs has been a thriving force for a revision of the reimbursement system for genetic tests. The new proposal is based on a stratification of all molecular genetic (and cytogenetic) tests into groups of simple, classical and complex tests. By virtue of its simplicity, it is cost-effective, manageable and flexible, and defensible from a budgetary standpoint.

He is most actively involved in the opposition procedure against the patents on the breast cancer genes. Most recently, he has brought together nearly 20 national genetic societies and institutes for a joint opposition against the BRCA2 patent. It is clear, however, that apart from problems with the patenting of genes and sequences, there is a lacuna in the European and national legal systems for the regulation of licensing. These aspects require close attention from the ESHG in the next few years.

Finally, he is also striving towards a more formal recognition of the non-medical laboratory experts - molecular and biochemical geneticists and cytogeneticists, and any good proposal in that direction will have his support.



Pier Franco Pignatti, (Verona, Italy)

Pier Franco Pignatti, (Verona, Italy) is a professor of Molecular Genetics in the Faculty of Medicine of the University of Verona, Italy. He is the president of the Italian Society of Human Genetics (<http://sigu.univr.it>), just re-elected for two more years, and is a member of the Steering Committee of the EU CF Network.

His main research interests range from Cystic Fibrosis and related diseases, in particular pulmonary diseases, genotype-phenotype correlations, to asthma and cardiovascular diseases linkage and association analyses.

Pier Franco Pignatti, now 57, has studied Medicine in the University of Pavia, as a member of the 500 year old Ghislieri College, where he graduated in the Genetics Institute directed by Prof. Luca Cavalli-Sforza with a thesis on Mono Amine Oxidase polymorphisms. Soon after getting his M.D., he worked with Prof. Cavalli-Sforza in the molecular genetic analysis of serotonin receptors during a two year long stay at Stanford University Department of Medicine. While there, he also did research on Nerve Growth Factor complex and its subunits under the direction of Prof. Eric Shooter.

Back in Italy in 1974 he was appointed assistant professor of Genetics in the University of Pavia, followed by a year with an E.M.B.O. fellowship to work at the Pasteur Institute in Paris with Dr. Moshe Yaniv on polyoma virus minichromosome structure and function. Following that interest in the structure of viral DNA-protein complexes, he has also worked for three months in the University of Glasgow with Prof. John Subak-Sharpe on herpes viruses.

He then became a full professor of Genetics in 1981 in the Faculty of Sciences at the University of Catania, where he continued for four years the study of herpes virus DNA-protein complexes structure and function.

In 1984 he was called to the Faculty of Medicine of the University of Verona which was beginning its activities at the time, as a professor of General Biology, as then Genetics was not an official full course in the Italian State University system. He then worked in Medical Genetics, as no Genetics was present locally.

He founded what was then called the Institute of Biological Sciences, which then changed its name to the Institute of Biology and Genetics, and in 1998 to Section of Biology and Genetics in a larger Department of Mother and Child, Biology and Genetics, together with Pediatrics and Obstetrics and Gynaecology.

He founded in 1988 the School of Specialization in Medical Genetics, which he still directs.

Election of President-Elect & Board Members 2004

The Society Board intends that the President-Elect and four Board members will again be elected by postal ballot of all the members, rather than by voting in person at the Annual General Meeting, to increase participation of all members. Members of the society who wish to stand for election are requested to read the job descriptions of the duties of the President and Board Members detailed on the back of the enclosed nomination form. The Statutes of the Society state that the Board should be broadly representative of nationalities and specialties. A list of current Board members is on the Society's web site (www.eshg.org) (Term of office ends at the general assembly in the year shown in brackets.)

The ballot form showing the names of members wishing to stand for election will be sent to eligible voting members in the next mailing and a date given by which it should be returned. The result will be announced at the Annual General Meeting.



Membership Renewal - Information for 2004

It is now time to ask you to renew your subscription for 2004. You will shortly be receiving a form to renew your membership, showing the different classes available. Please note that if you take out a full (Regular) membership you may have an electronic subscription to the Journal as well as a paper copy. The Journal will not be delivered to you from December 2003 until we receive your renewal form, so please do not delay when you receive your renewal request. We are pleased to report that subscription rates will now be charged in Euros and collected by the Vienna Medical Academy, Austria, who will now administer the membership on behalf of the Society.

New Administrative Arrangements for the Society

As Professor Peter Farndon's term of office as Secretary-General is coming to an end, the Board felt that we should ask the Vienna Medical Academy to take over the administrative arrangements for the Society. Consequently Patricia Wright left her post in Birmingham, United Kingdom, as administrator to the Society at the end of August this year. The Board wishes to express their thanks and appreciation of the valued work undertaken by Patricia during her employment by the Society.

Please note the new administrative office contact details are:

Ms Karen Knob

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The ESHG is a member of EPPOSI

The European Platform for Patients' Organizations, Science and Industry (EPPOSI) is a unique EU patient-led partnership between patients, industry and academic science, founded in 1994. EPPOSI's primary mission is to establish a strong European alliance of patients' organizations, academic science, including clinicians, and industry jointly working on healthcare policies towards treatment and prevention of serious diseases.

This mission is achieved through a range of different activities. Prioritization of issues and activities is subject to continuous scrutiny as new challenges to public health and the medical community arise.

Its activities include:

- Partnering workshops for scientists, clinicians, patients and patient groups, payers, industry and policy makers, to address human health threats and novel treatment options, and help find new, practical and effective solutions to ensuring the highest level of public health in Europe.
- Liaison and networking between all partners involved and policy makers to communicate and coordinate efficient health care policy solutions.
- Drafting of briefing materials and publication of opinions on issues relevant to EPPOSI's mission.

Any action taken by EPPOSI is based on the support of all its members. Emphasis is put on building consensus positions and policy recommendations on human health care matters. In doing so, the Platform ensures timely and effective input into European political debates and hearings (e.g. discussion of EU legislative efforts on orphan medicines, clinical trials, pharmaceutical legislation, etc) and congresses (e.g. European Society for Human Genetics).

Thanks to the unique multi-stakeholder approach, which permeates its spirit, organizational structure and activities, EPPOSI has been successful in reaching consensus between the different stakeholders towards the establishment of the European Orphan Medicinal Products Regulation. This has substantially furthered the cause of rare diseases, stimulating discussion, opinion making and public debate at the European level.

Currently addressed topics include:

- Promotion of research on innovative medical solutions for unmet medical needs, development of new diagnostics, treatments and prevention for life threatening and chronically debilitating diseases.
- Promotion of dialogue about benefits, safety, regulatory oversight, and ethical, legal, and social issues which the introduction of new technologies, including gene and cell-based therapies, and medical devices may raise and promotion of efforts toward finding consensus solutions.
- Promotion of fair and equitable health care budgets and appropriate reimbursement for diagnosis, including genetic testing, and treatment of life threatening and chronically disabling diseases. Improvement of access to newly developed therapies.
- Encouragement of timely and effective input of patient organizations in the European political debate on matters that concern them and encouragement for increased funding to patient support groups in Europe.

Past events include:

2002	3rd Rare Disease and Therapy Development Workshop - Italian Senate, Rome
2002	Access to Treatment Workshop - Barcelona
2002	Satellite activities at the 34th ESHG Congress - Strasbourg
2001	2nd Rare Disease Therapy Development Workshop - French Senate, Paris
2000	Patients and East-West Cooperation in Health Issues Conference - Brussels
2000	1st Rare Disease Therapy Development Workshop - Belgian Parliament, Brussels
1998	The Patients' Role in European Health Policy Making Conference - Brussels
1997	Biomedical Research and Orphan Drugs Workshop - Brussels
1996	Biomedical Research and Patenting Workshop - Brussels
1994	Ethical Aspects of Biomedical Research Conference - Brussels

EPPOSI is registered as a not-for-profit International Society under Belgian law. Membership of EPPOSI is open to representatives of European patients' organizations and charities, companies, and academic scientists and their associations working in the field of human health care in Europe, financial institutions interested in human health care in the broadest sense, and European or international institutions.

The Board of Directors, consists of Members of EPPOSI representing patient organizations (8), academia (5) and industry (5):

Chair: Ysbrand Poortman, Dutch Alliance of Parent/Patient organizations, World Alliance of Neuromuscular Disorder Associations; **Director:** Cees Smit, Honorary Member of EPPOSI Executive Committee, Chair Dutch Parent and Patient Organisations (VSOP)

Members from Patient Organisations:

Michael Griffith, EPPOSI Treasurer, Fighting Blindness Ireland; Mary Baker, European Parkinson's Disease Association (EPDA); Rodney Elgie, Global Alliance of Mental Illness Advocacy Networks-Europe (GAMIAN-Europe), President of the European Patients' Forum (EPF); Jean Georges, Secretary-General Alzheimer Europe; Lesley Greene, European Organisation for Rare Diseases (Eurordis), Children living with inherited metabolic disorders (CLIMB); Alastair Kent, Genetic Interest Group (GIG), European Genetic Alliance of Parent/Patient organisations, Member of the Committee for Orphan Medicinal Products of the European Medicines Evaluation Agency (EMA)

Members Representing Academic Science:

Jean-Jacques Cassiman, EPPOSI Secretary, Member of Executive Committee, European Society of Human Genetics (ESHG), University of Leuven, Belgium; Ségolène Aymé, INSERM, Orphanet France; David Bennett, European Federation of Biotechnology (EFB)

Members Representing Industry:

Erik Tambuyzer, EPPOSI Vice-Chair, Member of Executive Committee, Genzyme Europe Klaus Lindpaintner, Hoffmann-La Roche; Andrea Rappagliosi, Serono International Jean-Marie Vlassembrouck, Baxter

EPPOSI held its "4th Rare Disease Therapy Development Workshop" on 13-14 November 2003 in The Hague, Netherlands.

For further information: <http://www.epposi.org>

ESHG Birmingham 2003



Dr Fiona Macdonald

The audience were given a taste of what to come with three excellent talks in the opening plenary session by three local "stars" Bruce Ponder, Mark Ferguson and Nick Hastie. There were three further plenary sessions on Population DNA banks, recent developments in neurogenetics and limb development. Symposia on a wide range of topics such as bioinformatics, chromosomes and disease and the genetics of endocrine problems were supplemented by 9 sessions of talks submitted by the membership and by a series of workshops. Such was the quality of the late

The 35th ESHG was held in Birmingham from Saturday 3rd May until the Tuesday 6th May. There were almost 1000 delegates from all over Europe as well as from the US, Middle East and Asia. The

breaking abstracts that 5 talks were squeezed instead of the planned three. There were three young investigator awards as well as the Isabelle Oberle award, which is dedicated to work on mental retardation which this year went to Dr Veltman from Nijmegen on High resolution whole genome microdeletion screening by array CGH. In addition, the registrants had the chance to look at over 900 posters and to visit an extensive commercial exhibition. Each year the Society presents its own award in recognition of individual achievement in human genetics. This year the award went to Professor Peter Harper who gave an excellent presentation on the history of genetics indicating the importance of remembering what has gone on in the past as well as the present. Delegates attended a dinner which reflected the multicultural nature of Birmingham with foods from the UK, China, India and the Caribbean. This was followed by a disco at which many of the members of the Society could be seen demonstrating their skills on the dance floor! The unusually sunny weather for a bank holiday weekend meant that delegates were able to sit outside to catch up with the day's presentations, to chat with colleagues and enjoy a drink or two with friends new and old. Overall the conference was hailed as a success both socially and scientifically.

THE 12TH INTERNATIONAL CLINICAL GENETICS SEMINAR

The 12th International Clinical Genetics Seminar takes place in Athens, May 21-25, 2004. The main theme of the Seminar will be "Prenatal Diagnosis".

The purpose of the Seminars, which were initiated in 1976, is to bring together scientists from different specialties with the intention of studying in depth one or two areas of clinical genetics. A dozen 30 minute lectures are accompanied by oral presentations on the topic. Ample time for discussions is anticipated.

The topics to be discussed in next May's Seminar include preimplantation diagnosis, prenatal diagnoses of various genetic conditions (Cytogenetic abnormalities, metabolic, blood and cardiovascular disorders), recognizable syndromes, as well as fetal metabolic imprinting, ethics of prenatal diagnosis and psychological impact of prenatal diagnosis.

Faculty includes Joyce Harper, Joy Delhanty, Const. Deltas, Emmanuel Kanavakis, Howard Cuckl, Stylianos Antonarakis, Philippos Patsalis, John Wolstenholme, Lewis Holmes, Robert Desnick, Dimitris Loukopoulos, and others.

We are pleased to invite you to attend and actively participate in the Seminar.

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Birmingham 2003

