Cellular Therapies

Current perspectives and advancements in transfusion medicine’s most recent evolution
3 viruses, 1 test, real-time discrimination
Now CE-IVD approved

Our newest NAT test for blood screening offers:
• Real-time detection and identification of 3 viruses in a single test (HIV, HCV and HBV)
• Covers 5 critical viral targets (HIV-1 Group M, HIV-1 Group O, HIV-2, HCV and HBV) in one easy-to-use assay
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• Improved workflow on a single platform

The most comprehensive NAT assay menu on a single platform
The fully automated cobas s 201 system is an easy-to-use, reliable blood screening platform used by over 250 blood banks worldwide. Maximize efficiency with ready-to-use reagent kits that cover seven major viruses: HIV-1, HIV-2, HCV, HBV, WNV, HAV** and B19V**

Now CE-IVD approved
3 viruses, 1 test, real-time discrimination
in a single test (HIV, HCV and HBV)
for viral discriminatory testing
The fully automated cobas s 201 system is an easy-to-use, reliable blood screening platform used by over 250 blood banks worldwide. Maximize efficiency with ready-to-use reagent kits that cover seven major viruses: HIV-1, HIV-2, HCV, HBV, WNV, HAV** and B19V**

*CE-IVD. The duplex test for HAV and B19V has been filed with the FDA under a Drug Master File. It is available to US laboratories that meet specific FDA requirements
**This product is not approved or available for use in the U.S.

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Editorial
As you know one of the main activities of ISBT is its congresses. The Central Office has been busy with final preparations for the 21st Regional congress of the ISBT in Lisbon. We are encouraged by the number of people who have registered, it seems that the scientific programme has met the requirements of the ISBT membership and you are keen to join us in Lisbon. The preparations for the 22nd Regional Congress to be held in November in Tokyo are going well. No congress would be complete without the presentation of abstracts from the delegates, either as an oral or a poster. A reminder that the abstract submission deadline is July 3, 2011.

This issue of Transfusion Today has a focus on cellular therapies. Last year ISBT established a joint Working Party for Cellular Therapies with AABB, both societies wished to embrace the field of cellular therapies, and it seemed appropriate to form a joint Working Party. Paolo Rebulla and John McManus, the joint chairpersons have written a short piece about the Working Party. Other articles in the section include aspects of stem cell donors, stem cell donation and sterility testing and the challenges of interdisciplinary co-operation in cellular therapies.

The regional pages include two short papers, one from Egypt and one from Mauritius, reports on the celebrations of a regional blood bank in Russia and the ideal donor in the United Arab Emirates and a report on the International Haemovigilance Network meeting held in Amsterdam in February. This meeting was supported by the ISBT Academy. In the section ‘from the Central Office’ there is a brief update on the ISBT Academy and how to apply for support for an Academy event. The Board wishes to expand the Academy to countries where workshops and meetings have not previously been supported by ISBT. To this end the Board has set aside substantial funds in its budget for the current financial year.

The Central Office staff looks forward to meeting you in Lisbon.
The ISBT-AABB Working Party on Cellular Therapies

After preliminary talks and formal deliberations, in February 2009 we were invited to co-chair a new Working Party on Cellular Therapy (WPCT) with the specific purpose of developing and sharing common views on the clinical use of cellular products between the ISBT and the AABB.

This article reports the WPCT objectives and a brief summary of activities performed to date.

The need for a new joint working party involving two major international professional organizations dealing with blood transfusion stemmed from the consideration that the future development of regenerative medicine – the most recent evolution of transfusion medicine – requires improved logistics for the procurement of novel blood and cellular products transported across national borders. These products would be prepared and distributed in full compliance with norms and regulations for donor safety to undergo donation and product release criteria.

These preliminary activities were carried out with a clear appreciation of related issues being addressed by the recently formed Alliance for the Harmonization of Cellular Therapy Accreditation (AHCTA). The WPCT members met at the ISBT congress in Berlin and at the Annual Meeting of the AABB in Baltimore to plan the WP activities. It was agreed that a good starting point was the development of consensus articles on donor selection and product release criteria. Selected members of the CTWP are currently finalizing these materials.

For allogeneic haematopoietic stem cell transplantation (HSCT) three sources of stem cells (Bone Marrow/BM, G-CSF mobilized peripheral blood stem cells/PBSC and umbilical cord blood/UCB) can be used.

All types of stem cell donation include donor recruitment, information and consent, HLA-typing, medical checks intended for donor safety to undergo donation and product safety for the recipient, release of the donor to donate, stem cell harvesting, (serious) adverse events reporting, and consent to contact the donor in case of a second donation request. In case of UCB, recruitment and consent regards the mother of the child. Second donation request of UCB donors is impossible, but in the future it is expected that part of the UCB can be manipulated to serve as a second product for immunotherapy.

“In contrast to unrelated donors who are counselled and examined according to international guidelines, for related donors such strict procedures are lacking.”

Several organisations are active to safeguard donors and recipients. Guidelines and recommendations are provided by the Foundation for the Accreditation of Cell Therapy & Joint Accreditation Committee-ISCT & EBMT (FACT-JACIE), the World Marrow Donor Association (WMDA), the National Marrow Donor Program (NMDP) and the Council of Europe. The WMDA recommends on criteria of (unrelated) donor eligibility, WMDA, FACT-JACIE and EU formulated requirements for the quality of the stem cell products. The European Bone Marrow Transplantation (EBMT), the Centre for International Blood and Marrow Transplantation Research (CIBMTR) and the World Wide Group for Blood and Marrow Transplantation (WBBMT) mainly register patient outcome. The 3rd edition of the EU guide prescribes that all living donors of organs, tissues and cells must be registered and offered life-long follow-up; this applies to related and unrelated donors. Because G-CSF mobilizes higher numbers of CD34+ cells, older patients are eligible for non-myeloablative transplantation. These patients have older siblings, which may suffer co-morbidity. In contrast to unrelated donors who are counselled and examined according to international guidelines, for related donors such strict procedures are lacking.

All these organizations and registries offer their expertise and experience or have already installed subcommittees to give recommendations. However, in practice for related donors often local/hospital-based policies are in use. The ISBT and AABB have large experience ranging from donors often local/hospital-based policies are in use. The ISBT and AABB have large experience ranging from related donors providing new cellular blood products. The European Bone Marrow Transplantation (EBMT), the Centre for International Blood and Marrow Transplantation Research (CIBMTR) and the World Wide Group for Blood and Marrow Transplantation (WBBMT) mainly register patient outcome. The 3rd edition of the EU guide prescribes that all living donors of organs, tissues and cells must be registered and offered life-long follow-up; this applies to related and unrelated donors. Because G-CSF mobilizes higher numbers of CD34+ cells, older patients are eligible for non-myeloablative transplantation. These patients have older siblings, which may suffer co-morbidity. In contrast to unrelated donors who are counselled and examined according to international guidelines, for related donors such strict procedures are lacking.
Advancements in Sterility Testing of Cell Therapeutics

Microbial safety of cell therapeutics
In contrast to blood products like plasma derivatives (e.g. coagulation factor concentrates), microbial safety of cell therapeutics presents an only partly solved problem [1]. Most approaches in pharmaceutical industry are not applicable in case of cell therapeutics (e.g. sterility of source materials not guaranteed, no sterilization by heat, radiation or filtration possible). Moreover, cell therapeutics often have a short dating shelf life, which often necessitates administration to the patient before sterility test results are available [2,3].

Established methods for sterility testing
Classical sterility testing is addressed worldwide in respective documents. In principle, they recommend incubation of test samples applying both aerobic and anaerobic incubation for 14 days. The indicator for microbial growth is turbidity. Addition of cell suspensions to the media, however, inevitably causes them to become opaque so that these methods are as a rule not recommendable for sterility testing of cell therapeutics. Automated culturing (BacT/Alert, BioMerieux, France, and Bactec, BD, USA) has been made available for sterility testing of cell therapeutics. These systems are used successfully for microbial screening of cellular blood components [4] representing a major progress, but also have their limitations for testing of cell therapeutics (e.g. unavoidable “sampling error” which does not produce complete information on sterility of the whole product) [3]. Nevertheless, the advantage of the automated culture system is the shortened incubation period of seven days. But considering the extremely short shelf life of much cell therapeutics, novel rapid and effective principles are needed.

Advanced methods for rapid sterility testing of cell therapeutics
Due to many similarities between cell therapeutics and cellular blood components several methodological principles developed in transfusion medicine should be applicable for cell based products [2]. Some methodological models at the Paul-Ehrlich-Institute (PEI, Federal Institute for Vaccines and Biomedicines, Langen, Germany) are presented in the following. To mimic the matrix of cell therapeutics, artificially contaminated Chinese hamster ovarian cells (CHO, 4 x 10^6 cells/ml) were inoculated with PEI Bacteria References (WHO Repository Transfusion Relevant Bacteria Reference Strains) with a final count of 5-50 CFU per sample (0.5 to 5 CFU/ml).

Universal Bacteria Real Time PCR
Detection of sequences of ribosomal nucleic acids conserved in all bacteria using real-time PCR offers a universal tool for their detection. The technique is very sensitive (~ 10 CFU/ml), rapid (1-3 hours), and relatively easy to perform [5]. To the best of the author’s knowledge, no commercial method is available on the market, however, efforts concerning this are being made by various manufacturers. Real-time PCR can be used directly (advantage: very rapid; disadvantage: detection of bacterial cadavers) or in combination with a short pre-incubation of the sample in liquid media as cited above (advantage: “growth based method”, i.e. detection of living microorganisms only; disadvantage: prolongation up to 6-10 hours).

Flow cytometry
Flow cytometry has been described as a feasible tool for rapid detection of microorganisms in PCs [6,7,8,9]. Results are avail-
able within 30 to 60 minutes. There is one approach on the market originally developed for food microbiology (BactiFlow, AES Chemunex GmbH, Germany) having a sensitivity of around 100 CFU/mL. A respective pilot study at PEI demonstrated that the method is generally applicable for cell therapeutics (Fig. 1).

As pointed out for real-time PCR, flow cytometry can be used directly or in combination with a short pre-cultivation showing in principle the same advantages and disadvantages. In case of pre-incubation the results are available within 5-20 hours.

Detection of Microcolonies
Another pilot study involves two methods originally developed for microbial monitoring of the environment; the Milliflex Rapid System (MR) and the Milliflex Quantum System (MQ), both Millipore, France) which are based on membrane filtration and visualization of microcolonies via ATP-bioluminescence (MR) or fluorescence (MQ) [10,11]. Applying the CHO cell model, the times for diagnosis were between 4-7 h (MR) and 7-13 h (MQ). Figure 2 shows the detection of three PEI Bacteria References.

Outlook
There is a strong necessity for development of novel principles in microbial safety of cell therapeutics. Moreover, we need a paradigm shift in thinking. Whereas the current asking regarding sterility is "we have to find everything", the new thinking has to be "we have to find as much as possible within the time frame available".

References
3 is better than 2

Three Centrifuges with a Total of 36 Positions for ID-Cards

The IH-1000 system is the only immunohematological device equipped with 3x12 centrifuges. This offers highest flexibility, throughput and safety for sample processing:

- Optimization of workflow and high throughput due to the ability to centrifuge up to 36 ID-Cards at the same time
- 3x12 centrifuges ensure a constant level of throughput with simultaneous emergency sample handling
- Flexibility for loading and starting emergency samples immediately at any time
- Integrated backup function to avoid any system interruption

These are some of the many features of IH-1000, the revolutionary instrument for immunohematological diagnostics for performing any type of test procedure.

The Complete Solution for Safe Transfusion

ISBT is demonstrating its serious commitment to intensify support of activities in this important field of transfusion medicine. In particular, this has become visible through the recent establishment of an own Working Party on Cellular Therapies at ISBT’s 31st International Congress in Berlin in 2010. In this issue of Transfusion Today, several articles appear which mirror the substantial ongoing activities within the working party. This compiles work on securing donor identification (see article by Dr. Anneke Brand), advancement in sterility testing in cell therapeutics (see article by Dr. Melanie Störmer), but also takes up such burning issues as the commercialization of cord blood conservation (article by the chair of the Working Party, Professor Paolo Rebulla). In addition, a report is given on a recent European meeting summarizing the current advances in the preclinical and clinical development of mesenchymal stromal cells (MSC), held in Milan in April 2011.

It is clear that the challenge to safeguard a high and transparent quality of our cellular therapeutics provides an enormous challenge to the entire field of translational medicine. We propose that transfusion medicine, due to its unique profile in expertise and developmental capacities, will be a prime discipline to spur this development through the ability of physicians working in transfusion medicine.

In the normal development of a cellular therapeutic, usually clinicians and scientists who have developed novel cell-based medicines come to us and wish us to convert their cells into a state-of-the-art therapeutic which is GMP manufactured and validated for all currently required regulatory standards. In this situation, transfusion medicine institutes which run their own research laboratories and scientific groups as an own scientific basis, operated by physicians and scientists with a background in preclinical and clinical research, will be at advantage as partners to the clinicians who develop new concepts of cellular therapies.

A main reason for this is the fact that these transfusion medicine doctors will likely speak two languages – the language of basic science but also the language of the manufacturer of a pharmaceutical cell product.

Ideally, the personnel at transfusion institutes will therefore also comprise physicians with experience in conducting clinical studies, and who can either facilitate interactions with the clinical study center or who could run activities of a study center at the same time. We can state that for our own institution of the Red Cross Blood Donor Service Institute of Transfusion Medicine and Immunohematology at the University Hospital Frankfurt, this concept has proven extremely fruitful and rewarding. We can recommend such a concept for the discipline of transfusion medicine in general, and can recommend ISBT to work on mediating interaction between such centers’ activities, and stimulating young researchers to follow integrated and interdisciplinary approaches in such environments.

We appeal to all physicians and scientists who are active in our Society and beyond in the area of transfusion medicine and in related areas, to consider models of substantiated and scientifically based interactions with their various clinical partners. This would involve taking them into the responsibility when designing a pharmaceutically best qualified clinical grade production process and product. Moreover they should be notified or even involved into the active surveillance of the integrity and preserved efficacy of cellular therapeutics. Of course, this will have to occur in addition to already established quality and release criteria for these medicines. We predict that the reward will be a mutual learning and interaction, and that this will increase the visibility, the quality and the credibility of the cooperative work between the individual involved disciplines. Such an approach should therefore contribute to a maximum benefit of a scientific approach in clinical cell therapy development and shall reward finally and especially our patients.
Stem cells from normal to cancer: The Good, the Bad & the Ugly

Strike Again

The title of the famous 1966 ‘spaghetti western’ by Sergio Leone has given many investigators an opportunity to make a paraphrase of positive and negative properties of stem cells (1-5). Here some good, bad and ugly features of stem cells along the pathway from normal physiology to cancer transformation, are discussed and should be taken into account when developing novel cellular therapy products and therapeutic protocols.

Normal adult stem cells from healthy individuals (the ‘good’), share two basic features which distinguish them from all other adult cells: self replication and progeny generation. Both are necessary to ensure the correct function of all body organs, tissues and systems. Blood is a remarkable and well studied example of such tissues, where hematopoietic stem and progenitor cells physiologically resident in a quiescent state in the bone marrow generate billions of red cells, white cells and platelets every day and at the same time self replicate to maintain the regenerative potential for future physiologic needs and for system repair after pathologic events. These processes are finely tuned to ensure the correct maintenance of this crucial homeostatic function. However, during their very long lifespan, these cells can accumulate genetic mutations and epigenetic alterations causing de-regulation of their function (the ‘bad’). Included in their sophisticated molecular machinery, stem cells dispose of powerful tools to repair damages caused by mutagens such as chemicals and radiation. Despite their documented and reassuring efficiency, these tools may be challenged by a number of causes including a generally increasing level of pollution, which can exhaust their self reparative capability and lead to cancer transformation.

Cancer stem cells share their origin with normal stem cells and the property of self replication and generation of a progeny consisting of more or less differentiated cancer cells. Unfortunately, cancer stem cells also share another self protective basic feature of normal stem cells, which greatly limits most therapeutic attempts developed for their complete eradication. Although our knowledge of these cells is still limited, their existence has been unquestionably proven in some blood, breast, colon, liver and brain cancers. With regard to the latter, unexpected findings from a recent study by Italian investigators provide novel evidence that most endothelial cells lining along tumour vessels do not derive from normal endothelium but from cancer stem cells, which can harness their differentiation capacity into mature cells to build new vessels able to feed the tumour.

This unexpected finding paves the way to new important therapeutic developments. First, it can provide a clue to understanding the cause of the relative inefficacy of current anti-angiogenetic therapies, which have been designed with the aim of targeting ‘normal’ endothelial cells and can be ineffective against vessels generated by tumour stem cells. Moreover, as the new vessels play a fundamental feeding role not only for tumour development but also for the survival of the tumour cell mass, preventing cancer stem cell transformation into new vessels could prove an effective therapeutic strategy against glioblastoma and, possibly, other tumours.

Not unexpectedly, studying the ‘bad’ and the ‘ugly’ could provide a solution to restore the ‘good’. In parallel, improved knowledge on the mechanisms of transformation of normal into cancer stem cells could improve our ability to develop safer and more effective cellular products for the treatment of our patients.

References

Federico Colombo
Centers of Transfusion Medicine, Cellular Therapy and Cytology, Foundation Ca’ Granda Ospedale Maggiore Policlinico, Milan, Italy.
In the Best Interest of My Baby

Some valuable arguments against commercial cord blood conservation.

Busy expectant mothers and their partners do not have much time available during the late phase of pregnancy when they are confronted with two alternative and conflicting options: should we store our baby’s cord blood in a private commercial bank for his or her future exclusive use – the so called ‘autologous conservation’ option – or should we generously accept the invitation made by public banks to donate cord blood for the community needs – the so called ‘solidaristic’ option? Although some mothers may be professionally attracted by the advice offered by some fashion, sports and entertainment VIPs – in spite of the usually limited knowledge by the latter on the topic under discussion – most mothers duly follow the guidance provided by mother nature which teaches them to act in the best interest of their babies. Accordingly, they seek for ‘evidence’ supporting their choice in favor or against the understandable ‘temptation’ of autologous conservation.

Most of the times, they have contacted me in my role as director of a large public bank with a crystal clear argument: we all know how important stem cells are as therapeutic tools and applications of these apparently ‘magic’ cells for the treatment of many pathologic conditions of the heart, liver, lung, kidney, brain and other important organs for which current therapies offer no hope. If the above is true, how could a mother deprive her baby of such a formidable source of repair for future illnesses?

We, as professionals involved in maternal counselling, have two options: option one is to refer mothers to many ‘position statements’ published in scientific journals by respected scientific societies or groups such as the American Society of Pediatrics, the Royal College of Obstetrics and Gynaecology, the World Marrow Donor Association, the Expert Group on Ethics of the EU (1-4), and others. A proportion of mothers with adequate cultural elements and sufficient linguistic skills allowing them to properly manage these documents find in the above sources of information appropriate elements for an informed choice.

For those unwilling or unable to use the above resources, or asking for additional advice, I found the next few arguments particularly enlightening.

**Argument one.** It is of course totally understandable and fully correct that you, as a mother, want to preserve for your baby ‘any best possible chance’. Let’s reason on what this chance can be when we talk of stem cells and their therapeutic application. The therapeutic option for today and the next few years to come is the treatment of severe blood diseases (some forms of leukemia, lymphoma, thalassemia, immune deficiencies and metabolic disorders). Clearly, if your baby suffers from a genetic condition, his or her own defective cells do not represent a suitable option for cure. Moreover, also in conditions which do not show a classical heritable pattern – eg leukemia – some cellular defects predisposing to a later development of the condition may be present also during the antenatal phase.

Again, autologous cells are not a good option for autologous transplantation in such cases. Finally, a slight degree of difference – technically termed ‘incompatibility’ – between transplant donor and recipient is desirable for the treatment of some tumours as the ‘graft versus host reaction’ played by the donor transplanted cells against the recipient organs and tissues can eradicate residual tumour cells resistant to chemotherapy. How could a rational mother of an unfortunate baby affected by leukemia in need of a ‘donor transplant’ (technically called ‘allogeneic’) to differentiate it from ‘autologous’ transplants) ask another mother to donate her baby’s ‘precious’ cells for this ‘lifesaving allogeneic transplant’ if she has not agreed to donate her own baby’s cord blood for others in need? Most mothers – being correctly interested in their own baby’s ‘best chance’ – understand argument one.

**Argument two.** Let’s assume that in 40-50 years totally innovative treatments are developed from cord blood stem cells to cure a number of conditions for which there is no treatment available today, eg hearing loss or neural degeneration. No one knows the future, but it is not totally irrational to expect that similar treatments could be developed starting from cells which are quite similar to cord blood stem cells and which mother nature preserves in our bone marrow at no cost and under strict quality conditions that are not so evidently maintained in many commercial cord blood conservation programs (5). Most mothers who are still skeptical after discussing argument one change their views after considering argument two. Last but not least, for some of them the savings linked to public donation are quite similar to cord blood stem cells and which mother nature preserves in our bone marrow at no cost and under strict quality conditions that are not so evidently maintained in many commercial cord blood conservation programs (5). Most mothers who are still skeptical after discussing argument one change their views after considering argument two. Last but not least, for some of them the savings linked to public donation are quite similar to the cost of 2,000 – 3,000 euros for private conservation providing precious additional resources for the care and education of their baby.

Don’t try to convince mothers with ‘dry science’ only. Follow their natural and correct reasoning to act in the best interest of their babies. Just provide them with elements to determine what this ‘best interest’ can be.
The purpose of the “Forum of Italian Researchers on Mesenchymal and Stromal Stem Cells” (FIRST) is to bring together the different experiences currently ongoing in the field of mesenchymal stem cell (MSC) research, also using the potential of the web to get scientists connected on a real time basis.

On April 18th 2011, the third meeting of FIRST was held in Milan, Italy, with the participation of attendants from 5 European Countries. Particular emphasis was put on the contribution of young researchers who were also awarded for the best abstracts. Presentations included studies on neuroregenerative properties of MSC and kidney repair, on MSC senescence, on mechanisms underlying MSC multipotency and their immunomodulatory properties. Moreover, the limits and bottlenecks of induced pluripotent stem cells have been reviewed, with particular attention to cardiovascular applications.

Mesenchymal stem cells and neuroregenerative properties. MSC have been proposed to control the progressive dopaminergic depletion caused by the selective death of neuronal subpopulations that is responsible for the symptoms in Parkinson’s Disease (PD). In the study presented by Patrizia Bossolasco, undifferentiated human MSCs have been implanted into the striatum of rats bearing a lesion the study presented by Patrizia Bossolasco, undifferentiated human that is responsible for the symptoms in Parkinson’s Disease (PD). In MSCs have been proposed to contrast the progressive dopaminergic that is responsible for the symptoms in Parkinson’s Disease (PD). In cardiovascular applications.

MSCs protected the murine differentiated Neural SCs (mdNSCs) against the cytotoxic effects of 6-OHDA in a co-culture system and multiplex human angiogenic array analysis on the conditioned media demonstrated a modulation of released cytokines.

The neuroregenerative properties of MSC have also been investigated in the context of peripheral nerve gap injuries that are currently repaired with an autologous nerve graft or biocompatible nerve conduits. The combination of biomaterials and MSC may facilitate improved nerve regeneration. The results presented by Giorgio Terenghi demonstrate that adult adipose-derived MSC differentiated towards the expression of phenotypic and functional characteristics of Schwann cells and transplanted into biocompatible nerve conduits, have beneficial effects in promoting enhanced nerve regeneration (2).

MSC and kidney regeneration. Important advances have recently been made in understanding the mechanisms underlying the effects of MSC in renal regeneration. Several studies support the paracrine action of MSC. It has also been demonstrated that microvesicles (MVs) derived from human bone marrow MSCs may be responsible for the observed effects of MSC. In particular, Benedetta Bussolati demonstrated that MVs expressed markers of neural cells, but no glial markers were detected. After transplantation, some transplanted cells acquired a glial-like phenotype in animals bearing the nigrostriatal lesion, but no differentiation toward a dopaminergic phenotype was observed. Interestingly, transplantation of cells showed increased survival of both cell bodies and terminals of dopaminergic neurons and a reduction of the behavioral abnormalities associated with the lesion. These results suggest that MSCs could stimulate the surrounding microenvironment to support damaged neurons substitution. It was also demonstrated that grafting MSCs sustained the survival of striatal/nigral dopaminergic terminals and enhanced neurogenesis in the substantia nigra and neostriatales. Moreover, MSCs expressed markers of neural cells, but no glial markers were detected. After transplantation, some transplanted cells acquired a glial-like phenotype in animals bearing the nigrostriatal lesion, but no differentiation toward a dopaminergic phenotype was observed. Interestingly, transplantation of cells showed increased survival of both cell bodies and terminals of dopaminergic neurons and a reduction of the behavioral abnormalities associated with the lesion. These results suggest that MSCs could stimulate the surrounding microenvironment to support damaged neurons substitution. It was also demonstrated that grafting MSCs sustained the survival of striatal/nigral dopaminergic terminals and enhanced neurogenesis in the substantia nigra and neostriatales. Moreover, MSCs protected the murine differentiated Neural SCs (mdNSCs) against the cytotoxic effects of 6-OHDA in a co-culture system and multiplex human angiogenic array analysis on the conditioned media demonstrated a modulation of released cytokines.
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- octaplasLG®: a S/D treated, prion reduced, biopharmaceutical plasma for transfusion;
- atenasIV®: a double virus inactivated, heparin free Antithrombin concentrate;
- albunorm®: a double virus inactivated human albumin.

To learn more about Octapharma, please come to our booth 431 at the ISBT Congress in Lisbon, or visit our website www.octapharma.com

The spring in the Northern hemisphere brings a very colorful season, where trees are blossoming and skies are no longer grey. Since my last address (February), I had the opportunity to be in Dubai (United Arab Emirates) and Dublin (Ireland) representing ISBT.

In Dubai, WHO is developing a program focused on Patient Blood Transfusion Management. This certainly requires a multidisciplinary, collaborative effort between all kinds of professionals responsible for transfusions at the patient site (physicians, nurses, hemovigilance officers, transfusion medicine specialists, and several medical associations). It really represents the final stage of the Blood Transfusion chain, which has not always been completely covered by some Blood Transfusion Centers, whereas the main focus was to provide adequate and safe blood units. I concur that it is time now to have transfusion medicine specialists working together with the patients’ corresponding physicians, so we can promote a more integrated interface between all players. This is certainly a very promising field to be developed by ISBT.

In this aspect, ISBT is starting the development of a new partnership with NATA. Following an invitation from Dalyyd Thomas (NATA President), I attended their Board meeting, held in conjunction with their annual meeting in Dubai. After a friendly and fruitful conversation, the ISBT Executive Committee approved my proposal to have NATA brought closer to us, by being more active with the ISBT Clinical Working Party, chaired by Jonathan Wallin. I wish Dalyyd and Jonathan success in this new joint activity, and hope that the fruits are harvested pretty soon.

The current issue of Transfusion Today focuses on the joint ISBT/AABB Working Party on Cellular Therapy, chaired by Paolo Wallin. I wish Dafydd and Jonathan success in this new, joint activity, and hope that the fruits are harvested pretty soon.

The ISBT Corporate Membership...

ISBT has introduced Corporate membership and is pleased to announce that currently two companies have become corporate members: Haemonetics and Roche.

Roche provides diagnostic and automation platforms used worldwide to improve the safety of blood products, increase laboratory efficiency, diagnose disease, monitor response to therapy and identify gene-based factors that may aid in treatment selection.

Roche has joined the corporate membership programme as a platinum member.

Haemonetics is a global healthcare company dedicated to providing innovative blood management solutions that customers. Their devices and consumables, information technology platforms and consulting services deliver a suite of business solutions to help customers improve clinical outcomes. Haemonetics has joined the corporate membership programme as a gold member.

For further information on corporate membership please contact the ISBT Central Office.
From ISBT Central Office

Welcome to our new members

February 2011 - April 2011

Africa
- CAMEROON: Claude Tayou Tagny
- SOUTH AFRICA: Lexley Bust

Americas
- MEXICO: Oscar Jimenez, Juan Carlos Wynter Garcia
- USA: Evan Bloch, Anna Ettinger, Lawrence Goodnough, William Greener, Matthew Murphy, Gorka Ochoa, Adonis Srizanopoulos

Eastern Mediterranean
- IRAQ: Yahook Al-Musawi, Faaiz Al-Qazzaz, Mohammed Khalid
- KUWAIT: Hanan Al-Awadi, Reem Alvenen, Christian Awadi
- QATAR: Mohammed Azhar Mohiuddin
- SAUDI ARABIA: Ali Alshereet, Layla Basrashwi, Osama El Fayoumi, Amr Ameen, Christian Awarasi
- OMAN: Yakoob Al-Musawi, Faez Al-Mohammed
- BAHRAIN: Ochoa, Adonis Stassinopoulos

Europe
- BELGIUM: Alain Alewaeters, Helena Bunkens
- DENMARK: Larsen, Titze
- GREENLAND: Nielsen, Helle Sarnum, Larsen, Lone Daniel, Laursen Vibeke
- ITALY: Michele Cirella, Giovanni Gajo, Donatella Lelekova, Alexey Rukavishikov
- PORTUGAL: Femmeke Prinsze, René van Lier Verbickiene, Evelina Zenkeviciene
- RUSSIA: Larisa Golovkina, Anastasia Verbickiene
- SWEDEN: Christian Erikstrup, Gitte Feldborg
- SWITZERLAND: Jutta Kovacs

Affiliations

The ISBT president and Board of Directors are looking forward to welcoming you to Taipei for the 22nd Regional Congress. The ISBT Regional Congress. After two days incarceration near Lisbon, Portugal, in June immediately before the 2011 Regional Congress in Lisbon, Portugal is now complete. The scientific committee has produced a broad and stimulating programme, which should provide plenty of interest everyone involved in transfusion science and medicine. So, if you have not done so already, why not check it out on the ISBT website.

For more information please visit isbtweb.org/taipei

Geoff Daniels

The ISBT president and Board of Directors are looking forward to welcoming you to Taipei for the 22nd Regional Congress. All the information regarding the congress e.g. abstract submission, registration, accommodation, key dates is available on the Taipei website isbtweb.org/taipei

Abstracts
You are invited to submit an abstract in one of the many topics available. You can share scientific findings with colleagues from around the region and stimulate your programme, which should provide plenty of interest everyone involved in transfusion science and medicine. So, if you have not done so already, why not check it out on the ISBT website.

For more information please visit isbtweb.org/taipei

Geoff Daniels
ISBT is willing to help support educational activities such as workshops and symposia.

Are you intending to host an activity related to Transfusion Medicine in 2011? The activity can be about any topic but must be related to Transfusion Medicine e.g. haemovigilance, transfusion transmitted infections, quality management.

ISBT may be able to help you. Information on how ISBT can support you and how you can apply can be downloaded at www.isbtweb.org

The concept of the ISBT Academy was developed with the intention to organise educational courses, and give support to national or regional courses or congresses. During recent years ISBT has supported workshops and meetings with the use of its logo and occasionally providing speakers for a programme with a particular focus. One of the successes of the Academy has been the Arab Transfusion Medicine courses.

Last year Anne Husebekk, ISBT Senior Vice President and Chairperson of the Academy and Judith Chapman, ISBT Executive Director met to discuss the activities of the Academy and to develop a plan for future activities. The plan was put to the Board meeting in February. The plan included the development of procedures for applying for an Academy event and an application form and a proposal to institute an ISBT Academy Standing Committee which will be chaired by the Senior Vice President. The Standing committee will consist of up to ten ISBT members will have international representation and include the ISBT Junior Vice President and the ISBT Scientific Secretary. This Standing committee will replace the Standing Committee on Education which has been dissolved.

The ISBT Board expressed its commitment to supporting the Academy and to demonstrate this commitment has allocated money to the Academy in the budget for 2011/12.

ISBT has developed a document on the procedure for applying for an Academy event and an application form. These are available on the ISBT website. Once the application form is received it is sent to a small review committee who make the decision for approval of the activity.

So far in 2011 the ISBT will support 12 activities in 11 countries. Two more activities are awaiting agreement.

For more information please visit the Academy page on www.isbtweb.org
Hepatitis C Virus and Peripheral Blood Mononuclear Cells

Though being a primarily hepatotropic virus, hepatitis C RNA genome sequences have been detected in many different organs. Furthermore, replication of the Hepatitis c virus in cells of the immune system has been linked to the capacity of establishing a chronic status through affecting their normal function. There has been a controversy in reporting the detection of the HCV in the cells of the hematopoietic system. Many authors demonstrated that the bone marrow has been found to be highly infiltrated by the virus, proven via HCV RNA sequences that the bone marrow has been found to be highly hematopoietic system. Many authors demonstrated that the bone marrow has been found to be highly infiltrated by the virus, proven via HCV RNA sequences that the bone marrow has been found to be highly hematopoietic system. Many authors demonstrated that the bone marrow has been found to be highly infiltrated by the virus, proven via HCV RNA sequences that the bone marrow has been found to be highly hematopoietic system. Many authors demonstrated that the bone marrow has been found to be highly infiltrated by the virus, proven via HCV RNA sequences that the bone marrow has been found to be highly hematopoietic system.

Traces of HCV RNA may persist in liver or PBMC for up to 9 years justifying the persistence of humoral and cellular immunity for years after viral clearance. This poses the potential risk for transmission and reactivation. In case of immunosuppression, PBMC all together with hepatocytes have been speculated to be a potential source for viral recurrence as in case of liver transplantation. These findings suggested that complete elimination of the virus is unlikely to be achieved.

Some authors proposed the hypothesis that favoring extrahepatic reservoirs by HCV viruses could differ according to the genotype and not the viral load. Some findings reflected a higher preferential tropism of genotype 1 viruses for PBMCs compared to genotype 2 isolates. Other studies reported preferential tropism of specific HCV viral quasi species for PBMCs.

More recent studies using sensitive assays such as “Transcription Mediated Amplification” have confirmed that in the successfully treated or aviremic seronegative cases for HCV failed completely to demonstrate any HCV RNA in PBMC while it has been detected in the majority of viremic cases. Thus they demonstrated that PBMC does not serve as reservoir for HCV patients who have clear sera for HCV RNA. It has been suggested that the detection of HCV viral particles previously reported have been attributed to adsorption of antibody-coated viral particles to Fc-receptor on the surface of the immune cells (monocytes, granulocytes, and B cell) and not to invasion of the virus to inside the cell as part of viral replication. Another justification of the detection of viral RNA in the polymorphs, is the take up of cellular debris of viremphatically infected cells by the phagocytic cells which might include viral RNA.

Some reported clinical evidences can support the fact that PBMC does not act as long lived reservoir for HCV. This includes the slow decrease in anti-HCV antibody titers in cases with spontaneous clearance of viremia and the sero-reversion detected in 7% of transfusion transmitted infections. This reflects the cis of antigenic stimulation inducing the antibody production.

“There has been a controversy in reporting the detection of the HCV in the cells of the hematopoietic system. This debate is still not solved though there is an increasing evidence of excluding PMNC of being the host for maintenance of the virus within the carrier cases. This could impact strategies not only for management of cases but also for blood transfusion screening protocols.

Gold Medal for the Ideal Blood Donor

United Arab Emirates – Sharjah Voluntary Work Award, 2010

Under the patronage of HH. Sheikh Dr. Sultan Bin Mohammed Al Qassimi, Member of Supreme Council, Ruler of Sharjah; Sharjah Voluntary Work Award in it’s eighth session has awarded four voluntary, regular blood donors with gold medals during the celebration of the award on 16th December, 2010.

The board of trustees for the above mentioned award has set a group of criteria for the ideal blood donor who can win the medal. The blood donor should be a voluntary, regular donor who has donated 30 times.

Sharjah Voluntary Work Award includes different categories of awards, all support humanitarian voluntary acts, and voluntary, regular blood donation is one of these categories.

The blood donation centers in United Arab Emirates are requested to nominate their ideal blood donors to the board of trustees of Sharjah Voluntary Work Award every year for getting the above shown beautiful golden medal.

This reflect the government support of United Arab Emirates to voluntary blood donations program which is the stone base for safe blood transfusion practice in all countries. It is also worthy to mention that United Arab Emirates has hosted World Blood Donor Day in 2008 as the fifth country in world and 1st Arabic country, under the theme “One Is Not Enough”.

If you’re looking for a blood-bank partner that will work hand-in-hand with you and provide the consistency, scope and quality that meet your needs, we invite you to discover what we have to offer in blood-virus screening. You’ll discover a partner with the capacity to develop new and better ways of doing things. You’ll find a partner that works relentlessly to improve processes, from product development to manufacturing and quality control.

A partner for the future. We know that our future – and that of our customers – depends on our ability to search beyond today’s solutions. To that end, we will continue investing in innovation that lies at the heart of our commitment: helping our customers to provide their services as efficiently and effectively as possible.

Like you, we’re moving forward on a mission. Shedding light on what matters today and tomorrow.
Bernardo Camacho Rodríguez
Scientific Director Blood, Tissue and Cells Bank
Hemocentro Distrital, Secretaria de Salud de Bogotá

A new welfare discipline, based on solid technical and scientific evidence called Tissue Therapy and supported by the technological advances in the cell and tissue preservation field has contributed to the development of transplants and implants. During the development of these advances, an essential component has been the participation of manipulation, cryopreservation and storage units, named Tissue and Cell Bank. These units or services have begun to be essential and necessary in all our Latin-American countries with the aim to offer therapeutic alternatives to many patients. Regrettably these services do not exist in some of our countries, or they are limited and do not procure or process all the different kinds of tissues that today are the object of transplant or implant.

The District Tissue Bank (Banco Distrital de Tejidos) of Bogota’s District Health Department is the first centralized public tissue bank in Bogotá and in Colombia. It was created and put into operation in 2010, in order to procure, process and cryopreserve different human tissues to be used in transplant and implant procedures by the public and private hospital network in Bogotá and other Colombian cities. Its activity is directed to supply primarily the poorest and most vulnerable population, lowering inequities and making the right to health a reality.

The implementation of the tissue bank has been carried out in phases. In 2010 the tissue bank started with skin, amniotic membrane, corneas and sclera. In 2011 osteoarticular tissues: bone, ligaments and vascular segments.

Bogota did not have a human skin bank, to satisfy the demand of many patients that have leisons, burns, ulcers or skin traumas, conditions which are treated by implanting skin obtained from cadaveric donors. This skin works as a temporary biological dressing while the patient generates his own new skin; these grafts benefit greatly the patients decreasing fluid and electrolyte loss, the risk of infection and pain and promoting epithelization, decreasing hospital stay and health cost. In some cases the all grafts precede the use of autologous grafts. The amniotic membranes are processed in the same way as the skin. Although there are other eye banks in the city and in the country, the tissue bank wanted to be a service alternative in terms of the quality of the corneal tissue and sclera being processed and the access to the poorest and most vulnerable population.

Our multissitissue bank was designed with high standards of quality and biosecurity: we also have instruments and equipment of the latest technology. We have developed a robust quality assurance system; and the sanitary conditions certification granted according to the Colombian sanitary legislation and the registration to the Regional No. 1 of the National Donation and Transplantation Network of the country.

An outstanding aspect is constituted by the need to strengthen and develop a culture in the community for the donation of organs and tissues: religious, cultural and traditional aspects and the misinformation of the public about the therapeutic use of human tissues have become barriers to obtain them.

It is worth to note that in the same perspective and direction we are in the final phase of assembly of the first public umbilical cord stem cells bank (BSCU) of the country, which will begin operations in 2012.

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Thus in a single center and headquarters, but interdependent, we have implemented a blood bank, a tissue bank and a cell bank (BSCU).

It is necessary to thank various tissue centers in Spain, for their support and collaboration and for their successful operating model that has become a global reference specially for Latin American countries.

Blood Safety in Mauritius

A Knowledge, Attitude and Practice (KAP) survey of blood donors in a small island nation.

The orientation of Mauritian economic activities into medical tourism has caused a drastic increase in the demands for safe blood and blood products. A nationwide Knowledge, Attitude, and Practice (KAP) sample survey provided the clues on how to expand, and retain the pool of regular, voluntary blood donors. The main focus was to increase the safety of blood, maximize efficiency of donor recruitment programs, and provide empirical demographic data about Mauritian donors and non-donors.

A randomized, cross-sectional study was carried out on a population of 200 blood donors and 200 non-blood donors, who were approached in several regions of the island. A KAP questionnaire, adapted to the Mauritian folklore and practices, was designed, pre-tested, and used to harvest information from the population.

The survey found that males make up 82% of Mauritian blood donors while non-blood donors are predominantly young female adults with disproportionately fear of the phlebotomy process (Table 1). Socio-demographic profile, ethnicity, socio-economic profile, unawareness, and knowledge are the 5 principal factors determining willingness to donate blood. Altruism is absent among Mauritians.

The ageing of the blood donors, in tandem with misconceptions from these subjects represent a direct threat to blood safety. Targeting the Mauritian young adults, an untapped pool of blood donors, is the answer to improved safety, and long-term sustainability of safe blood supply.

The full article can be found at www.isbtweb.org

Table 1 Characteristics of survey population
(Taken from a paper by Dr. Thumaah. The full text is available on the ISBT website.)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Blood donor</th>
<th>Non-blood donor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percentage registered</td>
<td>2.92 (35,000 registered)</td>
<td>97.08</td>
</tr>
<tr>
<td>Total population</td>
<td>200 (of which 80% regular blood donor)</td>
<td>200</td>
</tr>
<tr>
<td>Sample</td>
<td>38 years old married males of Indian origin with middle to high education and income.</td>
<td>29 years old single females of Indian origin with middle to high education and income.</td>
</tr>
<tr>
<td>Gender</td>
<td>M = 82% (164)</td>
<td>F = 18% (36)</td>
</tr>
<tr>
<td>Age</td>
<td>32.5 years old (190)</td>
<td>42.7 years old (110)</td>
</tr>
<tr>
<td>Marital status</td>
<td>74.5% married</td>
<td>41% married</td>
</tr>
<tr>
<td>Ethnic group</td>
<td>Indian origin: 81.5% (163)</td>
<td>Indian origin: 78% (156)</td>
</tr>
<tr>
<td></td>
<td>African origin: 11.2% (22)</td>
<td>African origin: 9.5% (19)</td>
</tr>
<tr>
<td></td>
<td>European origin: 3% (6)</td>
<td>European origin: 2.5% (5)</td>
</tr>
<tr>
<td></td>
<td>Chinese origin: 1% (2)</td>
<td>Chinese origin: 0.5% (1)</td>
</tr>
<tr>
<td></td>
<td>Mixed origins: 3% (6)</td>
<td>Mixed origins: 9.5% (19)</td>
</tr>
<tr>
<td>Level of education</td>
<td>No academic education: 2.5% (5)</td>
<td>No academic education: 2% (4)</td>
</tr>
<tr>
<td></td>
<td>Primary education: 12% (24)</td>
<td>Primary education: 13.5% (27)</td>
</tr>
<tr>
<td></td>
<td>School Certificate: 31.5% (63)</td>
<td>School Certificate: 14% (28)</td>
</tr>
<tr>
<td></td>
<td>Higher School Certificate: 23% (46)</td>
<td>Higher School Certificate: 37.5% (75)</td>
</tr>
<tr>
<td></td>
<td>Certificate/Diploma: 9.5% (19)</td>
<td>Certificate/Diploma: 12% (24)</td>
</tr>
<tr>
<td></td>
<td>Degree: 11% (22)</td>
<td>Degree: 11% (22)</td>
</tr>
<tr>
<td>Total household income</td>
<td>Low income (&lt;Rs.10,000): 25% (50)</td>
<td>Low income (&lt;Rs.10,000): 34% (68)</td>
</tr>
<tr>
<td></td>
<td>Medium income (Rs.10,000-25,000): 51.5% (103)</td>
<td>Medium income (Rs.10,000-25,000): 46% (92)</td>
</tr>
<tr>
<td></td>
<td>High income (&gt;Rs.25,000): 23.5% (47)</td>
<td>High income (&gt;Rs.25,000): 20% (40)</td>
</tr>
<tr>
<td>Residence</td>
<td>Rural: 55.5% (110)</td>
<td>Urban: 44.5% (99)</td>
</tr>
</tbody>
</table>

Prithviraj Thumaah, Janaki Sonoor,
Marie France Lan Cheong Waih
a Medical student, University of Pretoria; University of Mauritius (UoM), (2006-2009)
b Senior Specialist Pathologist, Head of National Blood Transfusion Service, Victoria Hospital, Candos, Mauritius.
c Senior lecturer, Faculty of Science, Department of Medicine, UoM, Réduit, Mauritius.

Regional SouthEast Asia

First Public Multi-Purpose Tissue Bank
Hemocentro Distrital, Secretaria de Salud de Bogotá, Colombia

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- Maintenance of globular suspensions
- Dilution of samples
- Dispensing of samples and reagents
- Incubation and centrifugation of DG Ge® cards
- Reading and interpretation of results
- Report generation

Kirov Regional Blood Bank:
75 years, renewal and unusual regular blood donor

The Jubilee conference “75 years anniversary of Regional Blood Bank” took place in Kirov in March 2011. Kirov is a city located 1000 km to the east of Moscow. Founded in 1936 the regional blood bank became the heart and source for the Kirov “transfusion hub”. Research Institute of Haematology and Blood Transfusion, Medical Academy and Plasma fractionation plant (under construction).

The old-fashioned blood bank has been renewed in the last couple of years with the Federal and regional government investing about 5 million euros in reconstruction and in purchasing new equipment (Figure 1).

Russia consists of 83 regions each having a governor. Eight regional governors are blood donors. Only the Kirov Governor, Nikita Belykh, is a regular blood donor. He and his team donate blood every two months (Figure 2).

Nikita Belykh was born on 13th June 1975 and on 8th of December 2008, was nominated governor of the Kirov Region. Even among the youngest Russian Governors he is healthy and modern-styled. For example, he received a reprimand from President Dmitry Medvedev for tweeting during an official meeting. He has also become a victim of his own blogging activity.

Belykh wrote an entry describing how he became a blood donor. In the post he made a link to a scanned-in PDF copy of his certificate (Figure 3). That certificate according Russian law gives the right to a day off of work. So it is useless for the governor.

This was just what a woman in the northern Russian city of Vologda needed to falsify a similar document. The woman saved the certificate on her computer and made the necessary changes in a photo editing program. She added in her name and a relevant date, printed the copy and gave it to her boss. The director decided to check the authenticity of the document and sent an enquiry to the Health Department of the Kirov region. The reply was that the certificate that matched this number was issued earlier to Nikita Belykh.

The Health Department is going to hand over the fraud evidence to local law enforcement bodies. While Belykh says the incident is shameful, he added, “That’s what you get for giving free access to documents. It’s both funny and sad,” he wrote in his blog.
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Haemonetics’ goal is to partner with our customers and help you collect the products you need, when you need them, and in the most efficient manner possible.

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The acquisition of the SEBRA line of collection equipment is a sign of our commitment to ensuring the success of your blood center.

Some 250 participants from over 35 countries and five continents attended the thirteenth seminar organized by the International Haemovigilance Network (formerly the European Haemovigilance Network). The Network and the ISBT Working Party on Hemovigilance are in communication with each other and collaborate on certain projects. Hemovigilance, their common focus, is defined as “a set of surveillance procedures covering the whole transfusion chain from the collection of blood and its components to the follow-up of its recipients (…), intended to make recommendations to improve transfusion safety.”

Throughout the seminar there were ample opportunities for exchanges between professionals. Plenary speakers on the first half day (Hemovigilance and transfusion safety: a global affair) set the scene by triggering reflection on cost of interventions. We were also reminded that hemovigilance should be rooted within and backed up by a functioning quality management system within blood service and hospitals. Actual focuses may differ between different parts of the world, as was made clear in presentations on blood safety in developing countries and hemovigilance in the US.

The programme on Hemovigilance in The Netherlands in the morning of the second day continued the challenge to reflect critically and systematically improve the hemovigilance activity, for instance by agreeing on definitions and addressing new developments such as transfusion outside hospitals. Interactive presentations from the Dutch transfusion experts and the national hemovigilance office TRIP (Transfusion Reactions in patients) using electronic voting highlighted differences between participants, both in transfusion practice and in interpretation and classification of hemovigilance reports. TRIP director Martin Schipperus presented the 2009 annual report and trends in 7 years of hemovigilance reporting: the encouraging rise of hemovigilance reporting, the encouraging rise of numbers of reports and the slower progress on implementation of recommended measures. A large part of the practical work of hemovigilance in hospitals is performed by transfusion safety officers (hemovigilance workers). An international survey among TSOs by Dutch members of the national hemovigilance platform pointed out the range of tasks and responsibilities, against a widespread lack of any formal requirement for specific training.

In the afternoon of the second day the parallel sessions and poster walk offered lectures by invited speakers as well presentations of submitted abstracts. All areas of the transfusion chain were covered, from donor vigilance (recording and vigilance of complications of blood donation, with a view to improving care and safety for blood donors) to errors and incidents in the blood transfusion chain and evaluation of the effectiveness of transfusion. The poster prize was awarded to Dr Dialina Brilhante and colleagues for their poster describing a pilot of RFID technology in the transfusion chain of a Portuguese hospital.

Future directions of hemovigilance were the focus on the final morning. Attention was given to physiology of vasovagal reactions to blood donation and possible preventive measures. Participants were stimulated to consider vigilance relating to autologous blood management techniques, such as the re-infusion of salvaged blood after surgery. The wider, international perspectives of hemovigilance and of biovigilance (which includes tissues, cells and organs) were presented and will become increasingly important.

What therefore have been the successes of hemovigilance? These were summarized in the results of a recent international survey of hemovigilance experts, presented by Dr. Jean-Claude Faber. Numerous improvements in transfusion practice have been seen in the 17 years since the first national hemovigilance system was created (in France). Some of the improvements might have come about without the work of the hemovigilance offices, but nevertheless hemovigilance can claim to have brought transparency and triggered action to reduce transfusion risks.

The concluding part of the seminar was the presentation of the second IHN award to Dr Lorna Williamson, co-founder of the well-known SHOT (Serious Hazards of Transfusion) office in the United Kingdom. In her award address Dr Williamson shared reflections on the first stages of SHOT, the major results of the past and new developments.

The full programme and list of speakers as well as most of the seminar presentations (in pdf) can be found on the IHN website (www.ihn.org.net). The next Seminar will be held in Montreal, Canada, on April 25-27, 2012.
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