CONFERENCE REPORT

ISCT 2015 Annual Meeting

ISCT 2015 Annual Meeting Las Vegas, USA 27–30 May 2015

"We know the potential of these therapies and the challenges of delivering them to patients. Now we need to devise solutions to overcome these challenges."

Over 1200 delegates from around the world gathered at Caesars Palace, Las Vegas, USA for the 21st ISCT Annual Meeting in May 2015. From eminent academic professors to Wall Street analysts, the field came together to discuss, share, debate and network across the three days. The notable heterogeneity of the audience reflected the need for people from different backgrounds to work together to deliver this new class of medicinal products in what is often referred to as the pre-competitive era of the cell therapy industry.

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HOT TOPICS IN PRODUCT DEVELOPMENT

- Bioreactors
- Serum-free media
- Particulates

BIOREACTORS

Bioreactors are necessary for allogeneic products where planar technology is not often sufficient. They also enable developers to monitor and control scale up especially in terms of quality, a sentiment most of the audience agreed with:

> "Once you can control the process, you can also optimize it and get a high level of consistency even from different donors"

commented **Ohad Kernieli** (Vice President, Technology and Manufacturing, Pluristem Therapeutics) who chaired the session. Some people commented, however, that for autologous products, where multi-tray technology can be sufficient to produce cells for one patient, such a high degree of control is not entirely necessary.

SERUM-FREE MEDIA

The issue of serum-free media received some lively discussion. Evidence indicates that serum has no real advantage to mesenchymal stem cell (MSC) proliferation and it can sometimes lead to unwanted background differentiation (presence of adipocytes when cells differentiate towards osteogenesis). **Dr Christopher Bravery** (Consulting on Advanced Biologicals Ltd) provided his perspective as a Regulatory Scientist and commented that:

> "It's desirable to use a serum-free medium but from a regulatory viewpoint, it's not a necessity."

Human platelet lysate is certainly not different in terms of adventitious agent safety. Using chemically defined medium would be useful to improve consistency; but the real difficulties can arise when changing to serum-free medium late in the development cycle, which can result in difficulties proving that your product remains comparable despite the change in media. Proprietary serum-free media also poses a risk to developers due to the supplier wishing to protect their proprietary formula versus the need of the developer and regulators to know the composition. Various approaches were discussed, including simply reducing the serum concentration or using human platelet lysate or human serum, all of which might be suitable in certain situations (e.g., low yield processes).

PARTICULATES

> "What is inadvertently added during cell therapy processing may be difficult to remove at the end."

For cell therapy products it seems that there are no explicit regulations or regulatory guidance documents on particulates and how to manage them. Thus, there is a clear need to develop standards or guidelines to address particulates in both cell therapy products and ancillary materials. During the session the discussion also touched upon the characteristic of cells "self-cleaning", a characteristic that might reduce

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the presence of particulates in cell-based products. Furthermore, cell clumps are also considered to be 'inherent particulates' but there is no evidence that cell aggregates are anymore immunogenic (unlike protein aggregates in protein therapeutics). However, the use of disposables, especially where closed operations entail multiple transfers through plastic tubing have the potential to accumulate all manner of particulates (organic and inorganic). Since filtration cannot be used the industry needs to focus on ensuring standards are developed to minimize these.

ANCILLARY MATERIALS

Session chairs:
Claudia Zylberberg (Akron Biotech), Lynn Csontos (StemCell Technologies)

Ancillary materials (also called raw materials) are materials that come into contact with the product but are not intended to be in the final product. From the panel discussion, it was clear that developers of cell-based therapies have the responsibility to define and ensure the quality of ancillary/raw materials and it is important that they work with the supplier to achieve that. One big misconception among developers is that they only need to ask the supplier for "GMP-grade" raw materials. **Scott Burger,** Advanced Cell & Gene Therapy, reiterated this point towards the end of the session

METHODOLOGIES TO IMPROVE DEVELOPMENT OF CELL-BASED REGENERATIVE MEDICINE PRODUCTS VIA REGULATORY SCIENCE

Michael Mendicino (Session Chair, Mesoblast), **Jiwen Zhang** (GE Healthcare), **Steven Bauer** (FDA), **Anne Plant** (NIST) and **Natalie Mount** (Cell Therapy Catapult) discussed examples of approaches taken to utilize regulatory science to help mitigate challenges faced by developers of cell-based medicinal products, such as differences in donor and tissue sources, characterization of critical quality attributes, assay accuracy and reproducibility. Michael Mendicino stated:

"When the technology in a relatively new field (emerging tech) moves so quickly, the need for regulatory science is essential"

Regulatory science will ultimately lead to the development of tools, standards and approaches.

Steven Bauer provided an overview of the FDA MSC Consortium's project to develop potency/identity assays that predict safety and efficacy using MSCs in the first instance. The open question is:

"What cell characteristics can you measure to predict safety and effectiveness?"

Anne Plant from NIST introduced the concept of measurement assurance, which is the level of confidence in the data used to make a decision – this is essential when establishing a standard. She advised writing down the sources of uncertainty even before running an assay so that an effective control can be designed. If the sources of variability are too many, then it will be difficult (if not impossible) to make it robust. During the panel discussion, she said that at NIST they are focused on standardizing flow cytometry and imaging technology and further stressed the importance of importing technology from other fields, such as short tandem repeats (STR), which could readily be imported from forensics to carry out karyotype analysis of MSCs where more conventional karyotype analysis cannot be applied.

– GMP is not a grade but a quality system; no regulators in the USA or EU will ever ask for that.

In a post-session conversation **Dr Christopher Bravery** added that a grade is a 'defined quality standard' and there are basically three relevant grades: pharmacopoeia (such as European, US and Japanese Pharmacopeia), pharmaceutical (licensed medicine/drug) and 'in-house' (where the developer defines the grade/quality). EP suggests pharmaceutical grade is preferred; unfortunately, this might be too expensive for cell-based products and arguably not usually necessary (i.e., where used as a raw/ancillary material). Until a more cell-based oriented grade is defined for raw/ancillary materials, the developer should select a supplier with a suitable quality system and work with them to define the quality they need for their products and it is important to bear in mind that what is normally accepted for clinical trial is not always accepted for MAA/BLA.

BIOLOGISTICS: Optimizing Costs of Cold Supply Chain

Chair: William Milligan (Steminent Biotherapeutics)

Speakers:
Michael Trocchia (Novartis)
Brian Murphy (Celgene)
Kevin O'Donnell (BioLife Solutions)

Kevin O'Donnell (Biolife Solutions) talked about how to avoid pitfalls in transportation of cell-based products. Lessons learnt from transportation of traditional drugs show that understanding stability of the product is critical in the development of cost-effective transportation solutions. He also stressed the importance of testing other parameters such as shear force, vibration and γ-radiation. Improving the shelf-life will also improve CAPEX for manufacturers where manufacturing can be centralized.

Brian Murphy (Celgene) advised that the 'right' model is very much cell specific, but selecting the right one is paramount. He also encouraged manufacturers to consider the cumulative insult a product undergoes – for example if a product requires cryopreservation followed by hypothermic shipping, then the cumulative effect on the cell-based product might be different to a product that isn't cryopreserved. A further complicating factor is that during transportation you rely upon external couriers and this often results in parameters not being as easily controlled as during the manufacturing process.

"With T-cell immunotherapies demonstrating a major step change in patient care, ISCT 2015 provided a forum to discuss the various technologies under investigation as well as look at new data from safety and efficacy studies. The change in clinical outcomes that has been observed has led to large investments and swift growth in the market, which will likely still be on the rise come ISCT 2016.

- **Emily Culme-Seymour,** LRMN

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Micheal Trocchia (Novartis) recommended that the R&D department should generate as much data as possible to help determine the optimal transportation solution. Each of the four industry standards – Ambient (20–25 °C), Refrigerated (2-8°C), Dry Ice (-80 °C), Liquid nitrogen (-190 °C) – come with their own limitations and challenges. It is not always true that shipping at ambient temperature is cheaper as the limited shelf-life might require express delivery by plane. Shipping at ambient temperature would be great but the shelf life for cell-based products is normally limited and nobody wants to repeat the 18 h shelf life of Dendreon.

GAME CHANGERS: Policy and Practice Changes Enabling the Commercialization of Cell and Tissue Products

Chair: Aby J Mathew, (BioLife Solutions)
Speakers:
Nick Crabb (NICE)
Reni Benjamin (HC Wainwright)
Yuzo Toda (Fuji)

The session touched on three broad categories of interest to the commercialization of cell therapies and regenerative medicine. **Nick Crabb** (National Institute for Health and Care Excellence), described their approach to assessment and reimbursement of cell therapies. Dr Crabb provided insight into the metrics of Quality Adjusted Life Years (QALY), and review of the cost of therapy in comparison to the impact on length and quality of life. This QALY metric was integral to the decision not to reimburse Dendreon's PROVENGE® (sipuleucel-T), and is currently being applied in a review of Autologous Chondrocyte Therapy.

Reni Benjamin (HC Wainwright) provided a perspective from Wall Street in regards to the interest and concerns that investors contemplate when evaluating cell therapies and regenerative medicine. Dr Benjamin explained that financial investment in biotechnology, and specifically cell therapies, had increased in 2014. The reality is that we are experiencing growth in the aging population, with an increase in chronic diseases. The pharmaceutical industry is trending towards decreased internal investment in research and development, along with expiring patents. Therefore, there is interest in innovative biotechnologies that may be acquired

"At ISCT there was noticeably increased interest in the management of the end-to-end clinical supply chain to achieve commercially viable platforms that are scalable – both upwards and outwards. There is growing recognition that autologous therapies demand a level of supply chain integration and orchestration of production pathways that exceeds that of any other field of medicine."

"Developing strategic IT-driven relationships across the supply chain will consolidate discrete functions across logistics, manufacturing, service and infrastructure domains and is the key to providing a single consolidated and integrated supply chain that can deliver commercial therapies at vast scale."

- **Jon Curley,** CTO, TrakCel

or licensed. There are many different investor types – long-term and short-term, bulls and bears – and investors are willing to invest more money if they believe there will be a faster return on their investment. Dr Benjamin's feedback was also that investors prefer randomized clinical trials vs historical analysis, when evaluating the potential for therapies. It was also insightful to hear what scares investors about therapies and companies; and those concerns include everything that creates lack of clarity, manufacturing issues, regulatory and clinical issues, and financing issues.

Takuya Yokokawa provided insights regarding FIRM, which is a sister organization to the Alliance for Regenerative Medicine (ARM), and the novel regulatory framework in Japan for regenerative medicine. In Japan, there is a goal to strike a balance between social commitment and business incentive/sustainability. To the patient, Japan seeks to provide high-quality therapies at a low price in a reasonably shorter timeline. Therefore, regenerative medicine therapies are being regulated separately from drugs and devices, with allowance for Conditional Approval while evaluating further confirmation of safety and efficacy, with a pathway to Marketing Authorization or revocation of the Conditional Approval. Many other national regulatory agencies, as well as the clinical and commercial stakeholders, are keenly watching the progress and results of this novel regulatory framework. Many developers worldwide are looking with interest to Japan and the opportunity the new regulatory framework might provide for a fast ROI and fuel the development of expensive regenerative medicine drugs. Following a question from the audience, Mr Yokokawa stated that the clear procedure as per what a company needs to do to get reimbursement from Japan's government will emerge as soon as PMDA starts getting more data from companies.

CONFERENCE CHAT

"The greatest contributor to product variability is usually the variability that exists between the donors. Donor variability is often much more significant than any variability that would result from manufacturing site changes."

- **Keith Wonnacott** (Former FDA Chief Cell Therapies Branch), Director Regulatory Affairs, Novartis

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Panel:
Reni Benjamin (HC Wainwright)
Joshua Schimmer (Piper Jaffray)
Jason Kolbert (Maxim Group)

INVESTORS/VOICE FROM WALL STREET

Reni Benjamin (HC Wainwright), **Joshua Schimmer** (Piper Jaffrey) and **Jason Kolbert** (Maxim Group) joined together in a panel discussion providing insight from the investor perspective. A key take home came from Jason Kolbert's thoughts on past failures of cell-based products:

> "Capital starvation led to the wrong clinical trial design. As this gets corrected, we will see more success due to the right clinical design. Cell therapy products are currently characterized by high price-tag/costs and sometimes just an incremental clinical benefit. However, costs will be engineered down and efficacy will grow."

Session Chair: Michael May (CCRM)

Speakers: Michael May, Phil Vanek (GE Healthcare) Geoff MacKay (Proteus)

APPROPRIATE VALUATION OF TRANSFORMATIVE THERAPIES UNDER DEVELOPMENT

Michael May (CCRM), **Phil Vanek** (GE Healthcare) and **Geoff MacKay** (Proteus) commented on the current state of the cell therapy industry and predicted future demands.

Phil Vanek advised that success of cell-based therapies will depend three main factors:

1. Do they work?
2. Can we make them cost-effective?
3. Can we deliver them globally?

This means that new manufacturing approaches and supply chain management strategies will need to be developed.

Geoff MacKay (Proteus) commented that clinical validation has arrived in the field, with the promising data from immuno-oncology in particular and that has driven lots of money into the field. However, the next step forward will be industrialization that will drive competitive advantage and bigger margins. Currently the field is centered on clinical data, but soon this will change and the focus will shift to how we are going to manufacture these products in a more cost-effective manner and this is going to drive the difference between two equally efficacious cell therapy products.

NOT-FOR-PROFIT ORGANIZATIONS' CONTRIBUTION TO ADVANCING CELL THERAPIES

Chair: Randy Mills (CIRM)

Speakers:
Randy Mills
Michael May (CCRM)
Keith Thompson (Cell Therapy Catapult)

Randal Mills (CIRM), **Keith Thompson** (Cell Therapy Catapult) and **Michael May** (CCRM) highlighted the effort of these three internationally recognized not-for-profit organizations and their impact on advancing cell therapies.

Dr Mills presented the CIRM 2.0 strategy, which is the new approach to helping develop stem cell treatments for patients with unmet medical needs. CIRM 2.0 features a reduced cycle time of 120 days as opposed to 22 months and is now also open to non-California-based organizations.

Discussing progress at the Centre for Commercialization of Regenerative Medicine (CCRM) since its inception 4 years ago, Dr May detailed their successful establishment of both academic and industrial networks and noted that they are now ready to create the third hub 'an investor network' so that "they are not just priming the system but they are fuelling it".

Dr Keith Thompson talked about the strategic vision of the Cell Therapy Catapult (CTC): a not-for-profit organization established by the UK Government to facilitate the development of the industry in the UK. Over the past 2 years, the CTC has helped a number of companies improve their value proposition (such as Reneuron), set up Catapult Therapy TCR Ltd (a company aimed at developing and commercializing modified T cells for WT1 over-expressing hematological conditions) and supported companies such as Videregen and Athersys to conduct their clinical trials in the UK. A £55 million large-scale advanced therapies manufacturing center is also due to open in 2017 to support late-stage and commercial manufacturing. When asked what he thought the next big step in cell therapy market evolution will be, Keith responded "Near-patient manufacturing. A company sells the hospital a kit and the doctor/nurse manufactures the product for that patient".

"The biggest challenge is undoubtedly regulatory compliance. Requirements are different depending on the country and customers often ask for something they do not really need just because they often do not understand what the real requirements are."

- **Dolores Juarez,** Sr. Global Marketing Manager, Fresenius

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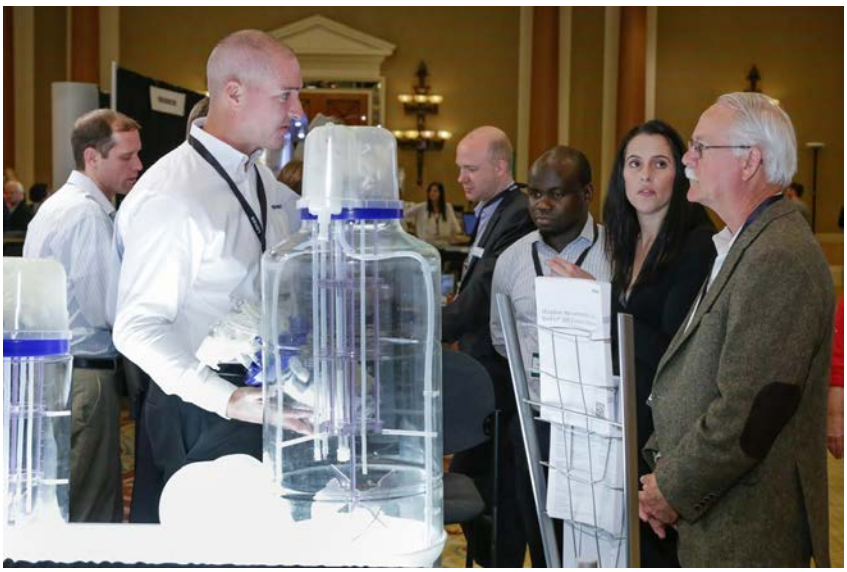

INTERVIEW

JULIE ALLICKSON

Wake Forest School of Medicine, Director Translational Medicine

Q What do you see as the key challenges in moving a product through to successful commercialization?

The key challenge, which I feel is a global issue for the industry, is scale up. There are some groups who feel they have a handle on it, but really getting a good system in place that we can scale up cost effectively is crucial.

When you are working with an allogeneic product you move to bioreactors to scale up; however the Wake Forest Institute primarily works with tissues from an autologous source. For an autologous approach, for example when you are making a urethra, we would perform a bladder biopsy and expand the cells in culture and this process becomes challenging when you're getting up to 30 or 40 hyperflasks, possibly using two rooms to make your product. So we ask the question "how can we use a smaller bioreactor system, using microcarriers to help accommodate our scale up needs at a reasonable cost?" and that's where the challenge lies – a bioreactor doesn't really align with being cost sensitive.

A great deal of people in academia, if they don't have the benefit of a translational group, don't have a strong understanding of process development. They can spend 10 years in the research phase and then want to move to the clinic but because they haven't necessarily incorporated

The key challenge, which I feel is a global issue for the industry, is scale up... getting a good system in place that we can scale up cost effectively is crucial.

CONFERENCE CHAT

"For a physician the main challenge is to comply with GMP standards and to bridge the gap from preliminary findings in the lab to a viable cell therapy product.

Compared to the 2014 ISCT meeting more safety issues have been addressed within the field and the focus has now shifted to Phase II studies and efficacy."

- **Prof Josef Priller**
Charité Universitäts medizin Berlin

the elements they would need to enable clinical development – such as toxicity and tumorgenicity – that translational shift is not possible. I feel education is therefore crucial – educate people early on.

Q What are the key take-home messages for you from this meeting?

An interesting issue that has been raised and which follows on from my previous comment is that we also need to think about continuously educating the public. We haven't had a huge number of 'big wins' in regenerative medicine and so we need to educate to ensure the public continues to support and understand what we can achieve.

CHRIS GEMMITI

Business Development Lead at Wyss Institute for Biologically Inspired Engineering-Harvard University

Q What do you think are the main challenges on the path to clinical translation?

As an industry, the bar we need to set for ourselves is greater clinical efficacy and lower manufacturing costs – those two issues are critical for more successful clinical translation of cell therapies.

There are several examples of companies or products that are commercially unsuccessful either by failing to meet their primary end points or they are just too costly to manufacture.

People often, sometimes unfairly, refer to the Dendreon's Provenge® as an example of this: here's a product that has tremendous science behind it, received approval and reimbursement despite being priced at over $90,000 per course of treatment. However, it was still very expensive to manufacture – at almost 50% unit cost for a time – and it only offered an additional 4 ½ months on average improvement on life expectancy.

In parallel J&J developed a different therapy for the same indication that's only a fraction of the cost and offers approximately the same efficacy as the cell therapy product. As an industry we have to understand that (for the most part) our products will always be more expensive than a pill, an antibody or a small molecule – therefore they really have to demonstrate signficantly better efficacy and safety compared to the competition or we have finds ways to drive down our costs.

Where the field is seeing some really promising results is immune-oncology and CAR T cells. Undoubtedly these products are still going to be expensive to manufacture for the forseeable, we are looking at incredible efficacy and clinical data – 90% complete remission at 6 months for leukemia patients. That's the bar we

> As an industry, the bar we need to set ourselves is much greater clinical efficacy and much lower manufacturing costs.

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should aspire to if we are going to talk about $10,000+ unit costs for therapies.

Q What value do you gain from attending the ISCT meeting?

The balance and mix of key stakeholders is quite unique to this meeting. It's a chance to learn from academic researchers, medical/clinical experts as well as diverse industry players – pharma, biotech, equipment/tool providers and diagnostic companies. Having these mixed parties naturally gives rise to partnering, strategic and business development opportunities which is an essential value add.

LEE BUCKLER

VP, Business & Corporate Development, RepliCel

Q What do you see as the key challenges in moving a product through to successful commercialization?

Right now the biggest hurdle to moving cell therapies forward is clinical data – it drives everything. When you have good clinical data – as seen in the immunotherapy space – things can happen extraordinarily fast: investment floods in, deals are made, regulatory hurdles get pushed aside – things happen.

"In Australia there is a Medical Exemption Framework in place which results in companies that market their products in Australia often finding they are in competition with hospitals manufacturing their own cell therapies.

Regulatory harmonization is critical to the advancement of the field and the new FDA/CANADA/EMA initiative to collaborate and attempt to harmonize cell-based products is going to play a key role in driving this forward.

Many cell therapy products failed at Phase I because companies underestimated the difference between auto and allo therapies – they fell into the trap of believing that the biology is more important than the business model."

- **Dominic Wall**
CSO, Cell Therapies Pty, Australia

This leads us to ask: why don't we have the data? There are a number of factors at play here – sometimes it's the technology, but there's also pressures to design trials in ways which aren't optimal and some companies aren't willing to invest in developing the science fully before moving to clinical trials. I think we need to be more strategic and more patient.

Q There has been a lot of discussion regarding the role of clinical trial design in recent failures – how accurate do you think this is?

It is easy to blame clinical trial design retrospectively. Rather than just being a design problem, I think it's often a case of biting off more than we can chew – going for the big endpoints, high impact goals

Part of the issue is the huge assumptions we are making about what these cells are capable of doing and to my mind it's still just too early to know.

and when that fails, you've potentially lost your one shot.

Part of the issue is the huge assumptions we are making about what these cells are capable of doing and to my mind it's still just too early to know. One of the concerns I have about many cell therapies is the notion that you can perform a single systemic injection and a patient who's had a chronic disease for more than a decade is now cured.

We're excited about the power of these cells, and we want them to do everything for us, but I think we are being a bit unrealistic in many instances with the way we design these trials and the expectations we have of their power.

Q Since the 2014 ISCT meeting how has the field moved forward?

Certainly the world embracement of cell-based immunotherapies has had a dramatic impact on the field – we had an inkling at the last ISCT meeting that there was some promise here, but this year immunotherapy companies can print money – it's phenomenal.

It's been an incredible year in this space and it supports the point I made earlier: when you have good data, everything changes.

The field has talked for a long time about how Big Pharma is going to find it difficult to seriously invest in autologous cell therapies due to the numerous challenges of manufacturing, logistics and cost of goods; but all these hurdles disappear if you have good data like we've seen with CAR T cells. If you have something that really works, these are solvable problems.

CONFERENCE CHAT

"Investors are always on the lookout for new areas in which to invest and we've seen a natural progression from small molecules to biologics and more recently to regenerative medicine and cell therapies.

We are mainly interested in highly unmet medical needs and potential blockbusters: oncology, CNS, ophthalmology and dermatology. We are starting to see some regional differences in investment preferences – US investors for example are more interested in T cell-based therapies; whilst Japanese investors are favoring iPSC-based therapies.

For investors, the critical question is around when you can expect a return on investment. For CAR T cells this timeframe looks to be around 3 to 5 years which of course corresponds to involvement of Big Pharma and makes these companies look like an attractive investment. In Japan, there are many companies looking to develop iPSC-based therapies but thus far there has been minimal engagement from Big Pharma and therefore investors are wary. From a global perspective, CAR T cell-based therapies are more marketable than iPSCs but this might change."

- **Hayato Watanabe**
Fidelity Growth Partners, Japan

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CHRISTINE PARMENTER

Scientist, Novartis

Q What do you see as the key challenges in moving a product through to successful commercialization?

The biggest challenge from my perspective is that there aren't many groups or companies on the exact same path to commercialization, so whilst there are of course some similarities between processes and critical issues, there are still significant differences and nuances for each product type.

This meeting has highlighted how much movement and excitement surrounds immuno-oncology – CAR T cells, engineered T cells; however, as we are not in that space we have to follow our predecessors, learn from their mistakes and successes, but ultimately we will be paving our own path to commercialization and encountering challenges unique to our product.

> ...make sure that your data and results are consistent so that you are able to say 'my product will behave in this manner with every single lot.

Q What do you perceive to be the benefits of attending a meeting like ISCT?

The combination of networking and educational sessions really help you learn from your colleagues and also ensure you make the right connections and have the critical conversations you need to be having. Networking is so much more than just deal making – it's about identifying the key people you need to speak to, who can in turn help connect you with contacts who will be instrumental in helping you move your product forward.

It's also about learning from your neighbors – common themes such as qualification, validation, what the regulatory agencies are looking at, what guidance you are following – hearing about their experiences in some ways helps verify your approach, or conversely can help identify where you might need to course correct.

Q What are the key take-home messages for you from this meeting?

The most telling theme was to make sure that your data and results are consistent so that you are able to say "my product will behave in this manner with every single lot".

COMMENTARY

Massimo Dominici, MD
President of ISCT,
University Hospital of Modena & Reggio Emilia, Italy

Beside the relevance of the event for the Society – being our biggest global annual meeting ever – in my opinion, our meeting has provided both a clear picture of the state of the cellular therapy field in 2015 and a "crystal ball"-like insight from the basic-to-translational findings that were presented there – often predicting what could be a near-term future for cell therapy industry. We have seen the amazing developments in immunotherapy for blood diseases, the paradigm-changing discovery of MSCs originating from neuroectodermal tissues, the early disappointment of mesenchymal progenitors in late clinical studies, the promise of tissue regeneration by 3D printing and decellularization followed by cell replacements, and we were left astonished by the biomedical research in space on stem cells which will influence our lives. This fascinating turbulent excitement is suggesting a "late teenage" time for cellular therapies with achievements and promises playing together in an active growing body. We shall absolutely need to let this body develop further with a constant eye on basic research and lessons learned, with sound clinical indications and no shortcuts, with healthy interactions between industry and academia within evolving regulatory frameworks. This is what ISCT is willing to support in the next years through meetings and strategic collaboration within the growing global cell therapy community.

COMMENTARY

Jaques Galipeau, MD FRCP(C), Co-Chair, ISCT 2015, Emory University, USA

The field of cell therapy at large is at a very interesting crossroads. The advent of CAR-T technology and the spectacular clinical benefit seen in subjects with advanced lymphoid malignancies are leading to a renaissance of interest in cancer cell immunotherapy with massive industrial participation and a companion bandwagon effect in academia. Contemporaneously, MSC-like cells, a mainstay of our Society' focus, are encountering a frustrating inability to meet the clinical endpoints that would inform a first in marketing approval by regulatory agencies. Notwithstanding the shortcomings of industrial scale MSC-like cells in pivotal trials, the field is advancing at a strong pace using robust scientific inquiry – as highlighted at ISCT 2015 – as a means to improve upon the manufacture, handling and ethical clinical delivery of MSC-like cells in a series of

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second generation of multicenter academic clinical trials – many of which are now launched in Europe. A rising tide lifts all boats and the enthusiasm associated with the CAR-T success allows for breathing space for on-going development of MSC-based platforms whose promise remains to be fulfilled.

COMMENTARY

Paul W Eldridge, PhD
Co-Chair, ISCT 2015,
University of North Carolina Lineberger Comprehensive Cancer Center, USA

The overall impression from the ISCT Annual Meeting is one of strong synergy. Attendees from every region of the globe gathered to learn, share and form collaborations. Disciplines represented included clinicians, bench researchers, manufacturing experts, industrial/commercial representatives, and regulators. This diversity speaks to the complexity that exists in the challenging path to delivering cellular therapy to patients. The exciting news of progress in immunotherapy and important lessons learned from advanced phase clinical trials in regenerative medicine were foremost among topics discussed by attendees between lectures. Novel approaches in cell culture techniques, better understanding about the nature of the mechanism of action of mesenchymal stromal cells, and even cells flying off to space were highlights from the meeting. The continuing discussion about the ethics of delivering safe and effective therapies was represented in a special session. Overall, the diversity of topics directly reflected the diversity of talent and expertise of the attendees. Cellular therapy continues to strongly advance and mature. It is an exciting time for both workers in the field and patients.