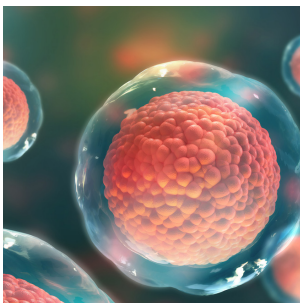
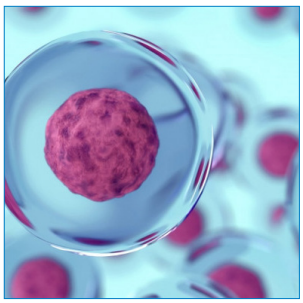
Scientific Tracks & Sessions
March 16, 2022

Stem Cell 2022




6th World Congress and Expo on

Cell and Stem Cell Research

March 16, 2022 | Webinar

Expression profiling in COPD – A new approach to resolving a complex pathophysiology

Rolf Ziesche
Medical University of Vienna, Austria

Three features of COPD have possibly troubled physicians most: a) a complex pathology characterized by relentless bronchial inflammation, dissolution of gas exchanging tissue combined with focal scarring, and all this driven by environmental hazards, b) its individual heterogeneity, and finally, c) the sheer length of this process, frequently covering decades.

A prospective study combining the analysis of validated clinical measures of COPD with genome-wide transcription analysis of peripheral lung tissue has now allowed for the first integrated view of COPD pathology.

The data suggest an incremental pathology commencing with the biophysical and metabolic consequences of failing surface integrity. This initial step results in an unresolved vulnerability towards any airborne hazards causing chronic airway inflammation and by that, in a growing challenge to organ repair. Owing to an individual's regenerative repair capacity upholding structure and function, this process may span decades. Only when the glycosaminoglycan matrix of the bronchial wall and the surrounding alveolar compartment will dissolve in combination with reduced primary repair, full-blown COPD will appear, and the prevailing secondary repair will then just permit a maintenance of structure at the prize of loss of function. This first holistic view must now be confirmed and further exploited in more detail. Nonetheless, we have come a step closer to an understanding of COPD pathology.

Speaker Biography

Rolf Ziesche MD is working as Associate Professor of Pulmonary and Internal Medicine at the Medical University of Vienna, Austria. He is also founder of the Pharmaceutical and Medical Research Start-up Transgenion in Vienna.

e: rolf.ziesche@meduniwien.ac.at

Understanding developmental mechanisms of primate just after implantation

Tomonori Nakamura
Kyoto University, Japan

It has been 15 years since the first human iPSC was established. Since then, various differentiation systems using human PSCs (pluripotent stem cells) have been established, and the PSC derivatives are now expected to be perfect source for regenerative medicine. As you know, mice are excellent mammalian model, and have contributed not only to the elucidation of many evolutionarily conserved phenomena, but also the establishment of the many human PSC differentiation protocols. However, species differences between mice and humans have also become apparent. For example, although BMPs are used in various differentiation systems and the differentiated human PSCs are reported to give rise to trophectoderm lineage, such phenomena has not been seen in mouse model. Such contradictions are caused by the lack of the knowledg of human embryogenesis, especially the molecular mechanisms underlying the human gastrula development which takes place immediately after implanation. To overcome this issue, we have studied primate development using cynomolgus monkeys which are the evolutionaly closest animals among the experimentaly ameneable organisms. In my talk, I will provide an overview about non-human primates from the evolutional aspect, and the recent outcomes of the research which I have done using the cynomolgus monkeys.

Speaker Biography

Tomonori Nakamura has completed his PhD from the Center for iPSC Research and Application (Dr. Shinya Yamanaka lab) at Kyoto University and postdoctoral studies from Graduate School of Medicine (Dr. Mitinori Saitou lab) at Kyoto University. He is now an associate professor of a New Institute for The Advanced Study of Human Biology, and The Hakubi Center for the Advanced Research at Kyoto University. He has been working on pluripotency using stem cells and *in vivo* materials of mouse as well as human and monkey, and published more than 25 papers on those studies in reputed journals.

e: nakamura.tomonori.4v@kyoto-u.ac.jp

Notes:

Degenerative osteoarthritis a reversible chronic disease

Valerio Di Nicola
University Hospitals Sussex, UK

Osteoarthritis (OA) is the most common chronic musculoskeletal disorder. It can affect any joint and is the most frequent single cause of disability in older adults. OA is a progressive degenerative disease involving the entire joint structure in a vicious circle that includes the capsule-bursa tissue inflammation, synovial fluid modifications, cartilage breakdown and erosions, osteochondral inflammatory damage leading to bone erosion and distortion.

Research has identified the initial inflammatory-immunologic process that starts this vicious cycle leading to so-called early OA. Research has also identified the role played in the disease advancement by synoviocytes type A and B, chondrocytes, extracellular matrix, local immune-inflammatory mediators and proteases.

This article investigates the joint-resident MSCs that play an essential local homeostatic role and regulate cell turn over and tissue repair. Resident MSCs establish and maintain a local regenerative microenvironment. The understanding of OA physiopathology clarifies the core mechanisms by which minimally invasive interventions might be able to halt and reverse the course of early-stage OA. Interventions employing PRP, MSCs and exosomes are considered in this presentation.

Speaker Biography

Valerio Di Nicola (VDN) is a surgeon and researcher currently working as consultant in general, emergency, and lower GI Surgery and lead of research and surgical audit at University Hospitals Sussex (UHSussex), NHS Foundation Trust- Worthing Hospital- BN112DH (UK). Further, he is the scientific director of the Regenerative Surgery Unit (RSU), Villa Aurora Hospital-Foligno-Italy. VDN started his career in regenerative medicine research during his PhD in microsurgery (1994-1999) at the Policlinico Umberto I - "Sapienza" University of Rome (Italy). From May 2013 to June 2015, VDN was scientific director of the Interbion Foundation for Basic Biomedical Research. Montedato, CH-6595 Riazzino, Switzerland. VDN has recently presented to various international conferences and published his new model of care delivered by the Regenerative Surgery Unit (RSU).

e: valerio.di-nicola@nhs.net

Notes:

CMV serostatus of donor-recipient pairs as a risk factor for CMV infection after allogeneic stem cell transplantation

Anna Dmitrova
National Research Center for Hematology, Russia

Cytomegalovirus infection (CMV infection) remains a frequent complication, associated with multiorgan disease in immunocompromised patients especially in patients after allogeneic stem cell transplantation (allo-HSCT). The presence of CMV IgG antibodies shows the immune response to human CMV of individuals. Many studies have shown that donor / recipient (D / R) CMV serostatus is an important factor that influences on the patient outcomes after allo-HSCT.

In our study we try to assess the incidence of CMV infection during 6-months follow-up period in patients after allo-HSCT depending on D / R CMV serostatus. Detailed patient characteristics (n=108) are presented in a table 1. We performed the CMV IgG antibody test in patients and their donors before allo-HSCT. Then we identified the D / R pairs depending on their positive or negative CMV IgG tests (=CMV status). In every group we investigated the incidence of CMV infection from 0 to 180 days after allo-HSCT. CMV infection was defined as detection of CMV DNA in any body fluid or tissue specimen by real-time polymerase chain reaction.

Our data presented in the table 1 show, that the incidence of CMV infection during 6-months follow-up period was higher in groups, where R+ had positive tests for CMV IgG. It confirms that CMV seropositive recipient serostatus remains the significant risk factor for CMV infection. The development of CMV infection from 30 to 180 days after allo-HSCT in the group D+ / R- was higher compared to D- / R- group. Possibly, it is associated with the incidence of acute and chronic graft-versus-host disease (GVHD) and long-term immunosuppression that increase the risk for CMV infection.

Therefore, to improve patient outcomes after allo-HSCT researchers should depend not only on the human leukocyte antigens (HLA) matching but also on the donor / recipient CMV serostatus.

Table 1. The impact of CMV serostatus of donor and recipient (D / R) on the incidence of CMV infection.

Patient characteristics (n=108)	D- / R-, n = 9	D+ / R-, n = 8	D- / R+, n = 15	D+ / R+, n = 76	p-value[1]
Gender, n (%)					0.39
Female	3 (33%)	6 (75%)	9 (60%)	44 (58%)	
Male	6 (67%)	2 (25%)	6 (40%)	32 (42%)	
Age, Median (IQR)					0.79
	37 (30 – 41)	29 (23 – 46)	35 (29 – 47)	37 (28 – 43)	
Diagnosis, n (%)					
Aplastic anemia	-	-	-	1 (1.3%)	0.18
Lymphoma	2 (22%)	-	-	1 (1.3%)	
Myelodysplastic syndrome (MDS)	-	-	1 (6.7%)	12 (16%)	
Acute lymphoblastic leukemia (ALL)	3 (33%)		6 (40%)	25 (33%)	
Acute myeloid leukemia (AML)	3 (33%)		6 (40%)	35 (46%)	
Primary myelofibrosis	-		1 (6.7%)	-	
Chronic lymphocytic leukemia (CLL)	-		1 (6.7%)	-	
Chronic myelogenous leukemia (CML)	1 (11%)	-	-	1 (1.3%)	
Chronic myelomonocytic leukemia (CMML)	-	-	-	1 (1.3%)	
Conditioning regimen, n (%)					
Myeloablative conditioning regimen (MAC)	1 (11%)	2 (25%)	3 (20%)	9 (12%)	0.52
Reduced intensity conditioning regimen (RIC)	8 (89%)	6 (75%)	12 (80%)	67 (88%)	
Graft source, n (%)					
Bone marrow	1 (11%)	-	3 (20%)	17 (22%)	0.60
Peripheral blood stem cells	8 (89%)	8 (100%)	12 (80%)	59 (78%)	
Type of donor, n (%)					
Matched related donor (MRD)	1 (11%)	1 (12%)	3 (20%)	24 (32%)	**<0.001**
Matched unrelated donor (MUD)	4 (44%)	-	8 (53%)	16 (21%)	
Mismatched unrelated donor (MMUD)	-	-	4 (27%)	8 (11%)	
Haploidentical related donor	4 (44%)	7 (88%)	-	28 (37%)	
CMV infection (0 – 30 days after allo-HSCT), n (%)					
No	9 (100%)	8 (100%)	7 (47%)	56 (74%)	**0.007**
Yes	-	-	8 (53%)	20 (26%)	
CMV infection (30 – 90 days after allo-HSCT), n (%)					
No	8 (89%)	3 (38%)	3 (20%)	28 (37%)	**0.007**
Yes	1 (11%)	5 (62%)	12 (80%)	48 (63%)	
CMV infection (90 – 180 days after allo-HSCT), n (%)					
No	7 (88%)	2 (50%)	10 (83%)	48 (77%)	0.52
Yes	1 (12%)	2 (50%)	2 (17%)	14 (23%)	

[1]Fisher's exact test; Kruskal-Wallis rank sum test

Speaker Biography

Anna Dmitrova has completed her study at RUDN University, Russia at the age of 23 years. She is a fellow in the department of bone marrow transplantation in National Research Center for Hematology, Russia. She studies reconstitution of cytomegalovirus-specific T cell immunity in patients after allogeneic stem cell transplantation, management and prophylaxis of cytomegalovirus infections. She has over 50 publications. She is also working on development of unrelated donation in Russia with the unrelated donor-recruiting group in National Research Center for Hematology, Russia.

e: dr.admitrova@gmail.com