



**INFRAFRONTIER**  
mouse disease models

**IPAD-MD Expert Group Meeting on Standards & Technology**  
**Deliverable 6.1**

**IPAD-MD Expert Group Meetings on Standards & Technology – Phenotyping  
(WP6)**

**14-15 September 2015, Seoul, Korea**

**IPAD-MD Expert Group Meeting on Standards & Technology – Archiving  
(WP6)**

**18 November 2015, CNR, Rome, Italy**

## **1. Executive Summary**

- The IMPC-INFRAFRONTIER Seoul Meeting was jointly organised and sponsored by INFRAFRONTIER and the International Mouse Phenotyping Consortium (IMPC).
- The meeting included 2 workshops for the IPAD-MD Expert Group on Standards and Technology focused on metabolic and behavioural phenotyping. This provided an opportunity for scientists from around the world to get together to discuss the phenotyping tests included in the IMPC's current pipeline and consider additional phenotyping tests for IMPC Phase 2.
- 114 participants attended the meeting including 48 from research organisations in Korea. The meeting was therefore an opportunity to inform researchers from Korea on the aims and progress of the project and allowed their input into the design of the pipelines.
- The main IMPC meeting also included updates on the goals and progress of the IMPC and discussed the application of CRISPR/Cas9 in mouse genetics. Proposals for a new ageing pipeline were presented and discussed and included a workshop on mouse sensory phenotyping. The resulting discussions in the main meeting and the INFRAFRONTIER IPAD-MD workshops will help to shape the future of the IMPC as it progresses towards Phase 2.

## 2. Agenda

14 September 2015

Time	Sessions	Speakers
08:30 – 09:00	Registration	
09:00 – 09:10	Welcome Address	<b>Je-Kyung Seong</b> (SNU, KMPC)
09:10 – 09:40	<b>Keynote Lecture</b> : Eye Movement Desensitization and Reprocessing ; a psychotherapy for fear disorders involves the superior colliculus-thalamis circuit	<b>Hee-Sup Shin (IBS, Korea)</b>
09:40 – 13:00	<b>Session 1: Current Status of IMPC</b>	<b>Chairs: Mark Moore/ Ann-Marie Mallon</b>
09:40 – 10:20	Production and Phenotyping Targets, Progress and Publications	Steve Brown (MRC, UK)
10:20 – 10:40	Embryo and Production Papers	Steve Murray (JAX, USA)
10:40 – 10:45	MPI2 Introduction	Ann-Marie Mallon (MRC, UK)
10:45 – 11:00	Tracking Mouse Production and CRISPR	Peter Matthews (WTSI, UK)
<b>11:00 – 11:30</b>	<b><i>Tea &amp; Coffee Break</i></b>	
11:30 – 11:45	Update from DCC on Data Upload, QC and Visualisations	Hugh Morgan (MRC, UK)
11:45 – 12:00	IMPC Website and Data Integration	Terry Meehan (EBI, UK)
12:00 – 12:20	IMPC Statistics	Jeremy Mason (EBI, UK)
12:20 – 12:40	Embryonic Image Data Analysis and Presentation	Henrik Westerberg (MRC, UK)
12:40 – 13:00	Disease Links through Human-Mouse Phenotype Comparisons	Damian Smedley (WTSI, UK)
<b>13:00 – 14:00</b>	<b><i>Lunch</i></b>	
<b>14:00 – 16:20</b>	<b>Session 2: Application of CRISPR/Cas9 in Mouse Genetics</b>	<b>Chair: Lauryl Nutter</b>

14:00 – 14:20	Mutant Mouse Production by CRISPR/Cas9 Technology	Han-Woong Lee (Yonsei Univ., Korea)
14:20 – 14:35	CRISPR/Cas9 Technology for genome editing in animals	Seok-Joong Kim (Toolgen Co., Korea)
14:35 – 14:50	Labcyte's workflow for CRISPR	Nick Samaras (Labcyte Asia Pacific)
14:50 – 15:10	Presentation on CRISPR/Cas9 Technology Development	Chenxiang Ju (MARC, China)
15:10 – 15:40	Experiences Implementing CRISPR/Cas9 in The Pipelines	Lauryl Nutter (TCP, Canada)
15:40 – 16:10	Discussion on Implementation of CRISPR/Cas9 in IMPC Phase 2	
<b>16:10 – 16:40</b>	<b><i>Tea &amp; Coffee Break</i></b>	
<b>16:40 – 18:00</b>	<b>Session 3: Mouse Ageing Pipeline</b>	<b>Chair: Martin Hrabě de Angelis</b>
16:40 – 17:00	Harwell Ageing Screen	Steve Brown (MRC, UK)
17:00 – 17:20	Aging in Skeletal Muscle: Significance and Functional Measurement	Wook Song (SNU, KMPC)
17:20 – 17:40	JAX Ageing Pipeline	Bob Braun (JAX, USA)
17:40 – 18:10	Discussion on Composition of Ageing Pipeline in IMPC Phase 2	
<b>18:10 – 18:40</b>	<b>Keynote Lecture:</b> Human & mouse genetics in 1000 dollar genome era	<b>Jong-Il Kim(SNU, Korea)</b>
<b>18:40</b>	<b><i>Macrogen Dinner</i></b>	

## 15 September 2015

Time	Sessions	Speakers
<b>09:10 – 12:30</b>	<b>INFRAFRONTIER IPAD-MD Expert Group Meeting: Workshop on Metabolic Phenotyping</b>	<b>Chair: Jan Rozman &amp; Karen Svenson</b>
09:10 – 09:30	Probiotics as an Immunomodulator for Hyper-immune Disorders	Sin-Hyeog Im (IBS,POSTECH,Korea)
09:30 – 09:50	Advanced Mouse Metabolic Phenotyping	Hui-Young Lee (Gachon Univ., KMPC)
09:50 – 10:10	Calcineurin links mitochondrial elongation with energy metabolism	Paul Pfluger (Helmholtz, Germany)
10:10 – 10:30	IMPC: Metabolic Phenotyping & Metabolomics	Jan Rozman (GMC, Germany)
<b>10:30 – 11:00</b>	<i>Tea &amp; Coffee Break</i>	
11:00 – 11:20	IMPC Metabolomics	Art Beaudet (BCM, USA)
11:20 – 11:40	Tryptophan-mediated communication between intestinal microbiota and gut immune system in mice	Dong-Mi Shin (SNU, Korea)
11:40 – 11:50	Proposed Metabolic Phenotyping	Karen Svenson (JAX, USA)
11:50 – 12:30	Discussion on Implementation of Metabolic Phenotyping in IMPC Phase 2	
<b>12:30 – 13:30</b>	<i>Lunch</i>	
<b>13:30 – 15:00</b>	<b>Workshop on Mouse Sensory Phenotyping</b>	<b>Chair: Steve Brown</b>
13:30 – 13:50	IMPC: Mouse Sensory Phenotyping	Steve Brown (MRC, UK)
13:50 – 14:10	Mouse Hearing Phenotyping	Jinwoong Bok (Yonsei Univ., KMPC)
14:10 – 14:30	Mouse Vision Phenotyping	Hosung Jung (Yonsei Univ., KMPC)
14:30 – 14:50	Mouse Olfaction Phenotyping	Chang-Hoon Kim (Yonsei Univ., KMPC)
14:50 – 15:00	Sensory Phenotyping Platform in KMPC	Kyoung-Yul Seo(Yonsei Univ., KMPC) & SooYoung

		Cho(SNU, KMPC)
<b>15:00 – 15:30</b>	<i>Tea &amp; Coffee Break</i>	
<b>15:30 – 16:50</b>	<b>INFRAFRONTIER IPAD-MD Expert Group Meeting: Workshop on Behavioral Phenotyping</b>	<b>Chair: Sara Wells</b>
15:30 – 15:50	Social Interaction for Standardized Behavioral Phenotyping	Shigeharu Wakana (RIKEN, Japan)
15:50 – 16:10	Home-cage Monitoring	Sara Wells (MRC, UK)
16:10 – 16:30	Neurobehavioral Phenotyping and Gait Analysis	Lore Becker (GMC)
16:30 – 16:50	Circadian, Fear Conditioning, Object Recognition and Gait Analysis Using Mouse Models of Diseases with Intellectual Disabilities	Yann Héroult (PHENOMIN-ICS)
<b>16:50</b>	<i>Main Meeting Ends</i>	
<b>16:50 – 17:40</b>	<b>Expert Group Discussion on S&amp;T Implementation in IMPC Phase 2 (by Invitation)</b>	<b>Chair: Steve Brown &amp; Yann Héroult</b>
<b>17:40 – 18:40</b>	<b>Feedback from PSC - IMPC SC Meeting (by Invitation)</b>	
<b>18:40 – 19:30</b>	<i>WooJung BSC Dinner</i>	
<b>19:30 – 19:45</b>	<i>Moving to Nanta Theater</i>	
<b>19:45 – 21:00</b>	<i>Social Program: Non-verbal Performance “Nanta” (Sponsored by WooJung BSC)</i>	

### 3. List of Participants

List of Participants		
Abel Ayadi*	ICS	France
Andrew Peterson	USA Genetech	USA
Ann Flenniken*	TCP	Canada
Ann-Marie Mallon	MRC Harwell	UK
Arthur Beaudet	BCM	USA
Atsushi Yoshiki	RIKEN BRC	Japan
Bjoern Schuster	IMG	Czech Republic
Bok Jinwoong Korea	Yonsei Univ., KMPC	Korea
Brandon Willis	UC Davis	USA
ByungHwa Hyun	KBIO	Korea
Chang-Hoon Kim	Yonsei Univ.	Korea
Chris Armit	IGMM, Univ. of Edinburgh	UK
Chun-fang Huang	NARLabs	China
Colin Fletcher	NIH	USA
Colin McKerlie	TCP	Canada
Corey Reynolds	BCM	USA
Cunxiang Ju	MARC Nanjing Univ.	China
Dae-Yeul Yu	KRIBB, KPMC	Korea
Damian Smedley	WTSI	UK
Dave Clary	UC Davis	USA
David West	CHORI	USA

## List of Participants

Dong Soo Lee	Bio-MAX/N-Bio,SNU	Korea
Dong-Mi Sing	SNU, KPMC	Korea
Eric Marcotte	CIHR	Canada
Fatima Bosch	UAB	Spain
Gao Xiang	MARC Nanjing Univ.	China
George Carlson	McLaughlin Research Institute	USA
Hail Kim	KAIST, KMPC	Korea
Hang Sik Park	Eulji Univ. KPMC	Korea
Han-Woong Lee	Yonsei Univ.	Korea
Hee-Sup Shin	IBS	Korea
Helmut Fuchs	GMC-HMGU	Germany
Henrik Westerberg	MRC Harwell	UK
Hiroshi Masuya	RIKEN BRC	Japan
Ho Lee	National Cancer Center, KPMC	Korea
Hosung Jung	Yonsei Univ	Korea
Ho-Young Lee	SNUBH, KMPC	Korea
Hugh Morgan	MRC Harwell	UK
Hui-Young Lee	Gachon Univ., KPMC	Korea
Hyoung-Chin Kim	KRIBB, KMPC	Korea
Hyuk Wan Ko	Dongguk Univ., KMPC	Korea
Ian Smyth	Monash Univ.	Australia
Il Yong Kim	SNU, KMPC	Korea
Im Joo Rhys	Korea Univ, KMPC	Korea
In Chul Lee	Asan Medical Center, KMPC	Korea



## List of Participants

Jacqui White	WTSI	UK
Jae-Hoon Choi	Hanyang Univ., KMPC	Korea
JaeHyung Goo	DGIST	Korea
JaeYoung Choi	Yonsei Univ., KMPC	Korea
Jan Rozman*	GMC-HMGU	Germany
Je Kyung Seong	SNU, KPMC	Korea
Jeremy Mason	EMBL-EBI	UK
Jesus Ruberte	UAB	Spain
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Ji-Young Cha	Gachon Univ., KMPC	Korea
John Mudgett	Merck	USA
John Seavitt	BCM	USA
Jong-Il Kim	SNU, KPMC	Korea
Juan Gallegos	BCM	USA
Jun-Gyo Suh	Hallym Univ., KPMC	Korea
Kang-Hoon Lee	SNU, KPMC	Korea
Karel Chalupsky	IMG	Czech Republic
Karen Svenson*	JAX	USA
Kent Lloyd	UC Davis	USA
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Ki Taek Nam	Yonsei Univ, KMPC	Korea
Ki Woo Kim	Yonsei Univ.	Korea
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Kim Choong-Yong	DGMIF	Korea
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Kyunghee Chun	Yonsei Univ	Korea
Lauryl Nutter*	TCP	Canada
Leo Chi-Kuang Wang	NLAC, NAR Labs	Taiwan
Lore Becker*	GMC-HMGU	Germany
Lydia Teboul*	MRC Harwell	UK
Martin Hrabe de Angelis	GMC-HMGU	Germany
Michael Dobbie	APN, ANU	Australia
Mi-Ock Lee	SNU, KMPC	Korea
Mohammed Selloum*	ICS	France
Mark Moore	IMPC	USA
Nick Samaras	Labcyte Inc.	Australia
Oleg Mirochnitchenko	NIH	USA
Paul Lasko	CIHR	Canada
Paul Pfluger*	HMGU	Germany
Peter Matthews	WTSI	UK
Radislav Sedlacek	IMG	Czech Republic
Rho Hyun Seong	SNU, KPMC	Korea
Robert Taft	JAX	USA
Sara Wells*	MRC Harwell	UK
Seokjoong Kim	ToolGen Inc	Korea
Seung Hyun Oh	Gachon Univ., KMPC	Korea
Shigeharu Wakana	RIKEN BRC	Japan

## List of Participants

Shinae Kang	Yonsei Univ.	Korea
Shinya Ayabe	RIKEN BRC	Japan
Shiyong Guo	Nanjing Univ.	China
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Soo Choi Cheol	Gachon Univ., KMPC	Korea
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Yang Eun- Jin	KIOM	Korea
Yann HERAULT*	ICS	France
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Young Cho Soo	SNU, KPMC	Korea
Young Seek Lee	Hanyang Univ.	Korea
Young-Ki Park	Yonsei Univ.	Korea
Yuichi Obata	RIKEN BRC	Japan
Yun-Hee Lee	Yonsei Univ.	Korea

\* IPAD-MD Expert Group members on Standards & Technology. Participants funded by European Union Horizon 2020 project IPAD-MD Grant Agreement number 653961.

## Introduction

- IPAD-MD WP6 on Implementation of Standards and Technology is led by Yann Herault, CERBM-ICS and Steve Brown, MRC Harwell.
- The aims of the working group are to:
  - Assess the potential of novel technologies for application in INFRAFRONTIER and IMPC, taking into consideration the feedback of the stakeholder communities
  - Provide recommendations for the global quality standards and SOPs for novel technologies
  - Ensure input to the stakeholder engagement workshops and process stakeholder feedback
- The workshops in Korea were established to focus on 2 areas of phenotyping
  - **Metabolic phenotyping and metabolomics**
  - **Behavioural phenotyping:** social interaction, home-cage monitoring, neurobehavioural phenotyping and gait analysis, circadian rhythms, fear conditioning and object recognition.
- Members of the IPAD-MD expert then met to discuss conclusions and produce reports on the areas below.
- The purposes of the workshops were to highlight improvements needed to the current Phase 1 pipeline, and to discuss potential changes to the pipeline before Phase 2.

## Metabolic Phenotyping

- During the IPAD-MD Expert Group meeting on mouse metabolic phenotyping Art Beudet (BCM, USA) and Jan Rozman (GMC, Germany) discussed in their presentations the implementation of metabolomics technology in the IMPC pipeline.
- Art Beudet presented data from a BCM pilot study using the Metabolon platform. Brain, liver, and plasma samples of one male and one female mouse from 32 mutant lines were analyzed. Key questions were identified as what is the expected hit rate, which analysis tools are best to handle data sets, which biomaterial is optimal for metabolomics analysis (plasma, brain, liver, other?). Further evaluation is required to determine whether samples can be pooled for males and females and to decide whether only selected genes should go into the pipeline. A couple of mutant lines were presented where significant deviations in metabolite profiles could be

linked to IMPC phenotyping results e.g. Nbr1 with a bone phenotype and increased levels of 3-Hydroxymethylglutaric acid which is linked to a rare inborn error of metabolism in humans.

- Despite the opportunity to easily link altered metabolite profiles to human disorders it was pointed out that a cost of 300 USD per sample (or depending on protocol 1800 USD per mutant line) can be expected. The non-targeted assay developed by Metabolon covers 400-500 metabolites from mouse plasma.
- Jan Rozman presented the HMGU portfolio of targeted and non-targeted metabolomics offered by the HMGU Gene Analysis Center. Assays cover 150 to 180 targeted metabolites from mouse plasma, serum, tissues, and urine based on Biocrates technology. In addition, assays were developed specifically addressing a selection of analytes from steroid and bile acid metabolism. The analysis of volatile organic compounds in mouse breath is also currently evaluated in the GMC.
- Robotized sample preparation, analysis and processing following validated SOPs and an efficient LIMS for sample tracking allow high levels of standardization even in large scale projects. Ongoing discussions in the group suggest that eligible IMPC partners should seek funding for metabolomics possibly of blood, liver and brain samples (optionally pooled) in a selected subset of mutant lines. It will be discussed in the near future how targeted mutant lines will be selected.

## **Behavioural Phenotyping**

### **Home Cage Monitoring**

- Combined SHIRPA and dysmorphology (CSD) has been a very valuable test during the first phase of the IMPC revealing many abnormalities in appearance, locomotion and behaviour which would not have been detected in other tests. Likewise the open field test has enabled the detection of activity and anxiety phenotypes. However it is widely appreciated that these tests (as is the case with others), measure the mouse behaviour at a 'snap-shot' of time, in a novel environment and may not necessarily reflect the full phenotype of the animal, especially missing intermittent and social anomalies.
- Systems for measuring animal in their home cages, over much longer periods of time are currently in use and being developed further. Individual behaviours can already be monitored in cages such as TSE Intellicage, NOLDUS PhenoTyper or HomeCageScan by CleverSys. These allow the monitoring of activity and complex behaviours as well as cognitive challenges, over long periods of time (weeks) on

singly housed animals. Currently being developed is a system by Actual Analytics which allows activity and behaviour to be monitored on groups of mice (up to 3) in the IVC cage they were reared in. By virtue of radio-frequency identification (RFID) chips in each of the animals it will soon be possible to further dissect social behaviours and cage hierarchies.

- Home Cage Monitoring promises some exciting refinements to behavioural phenotyping in the future. These include the opportunity for better, more comprehensive and sensitive measurements of cognition and social behaviours as well as an increase in accuracy in recording changes in activity and appearance. During Phase 2 of the IMPC, the behaviour and sensory group will collect, analyse and compare Home Cage Monitoring data with a view to its introduction into the phenotyping pipeline.

### **Gait analysis**

- Gait analysis considered for IMPC Phase 2 would cover the need for a motor test in the pipeline. Locomotor deficits affect a large proportion of the population and are a common and significant cause of reduced quality of life but also symptom of devastating and fatal progressive diseases like PD and ALS. Available automated treadmill systems have been used in several centers (e.g. TCP, MRC, JAX, ICS, HMGU), to some part for in-depth phenotyping.
- The method is sensitive to detect the non-obvious phenotypes currently not tested for. The method, as well as the phenotypes, translate well to human disease.
- Currently analysis of available data is in progress to identify optimal experimental conditions (e.g. speeds, potential incline). Measurement time per mouse of up to 30 minutes must be optimized for high throughput analysis. In addition, critical data and metadata for successful phenotype identification have to be tagged, also considering devices and software used. At the moment the test is not ready for high throughput and suggestions for protocol establishment and further test validation depend on ongoing data analysis.

### **Fear Conditioning**

- Fear conditioning (FC) is a well-defined test to evaluate associative memory. Several brain regions such as the hippocampus, amygdala, prefrontal cortex, mediodorsal thalamus and colliculus (Shin's group report) are needed to encode FC memory.
- Different protocols are used routinely in several centres (e.g. MRC, ICS, HMGU, etc.) for cognitive phenotyping. ICS has integrated the test in the current IMPC pipeline at week 10 and the outcome of the analysis is promising. MRC is now investigating the inclusion of the test in the week 11 of the pipeline.

- Nevertheless the main concern is the individual variability observed in the main capture variable, the freezing time, observed during the response to FC from the conditioned contextual or the cue stimuli paired with the unconditioned stimulus (light electric foot shock).
- Further investigations are ongoing in order to standardize the protocol and to evaluate the power of the test in discriminating mutant phenotypes from the wild-type response distribution.

### **Presentations**

The presentations are available for download at:

[www.infracorridor.eu/internal/ipad-md/expert-group-meetings](http://www.infracorridor.eu/internal/ipad-md/expert-group-meetings)

## IPAD-MD Expert Group Meeting on Standards & Technology – Archiving (WP6)

18 November 2015, Consiglio Nazionale delle Ricerche

Campus "A. Buzzati-Traverso" I-00015 Monterotondo, Rome, Italy

Minute taker: Ana de Castro (HMGU), General revision: Martin Fray and Mo Guan (MRC)

### 1. Agenda

10:30-12:30

- Oocyte & embryo vitrification- Mo Guan, MRC
- Oocyte freezing - Mo Guan, MRC
- Non-surgical embryo transfer – Mo Guan, MRC
- Ultra-superovulation – Mo Guan, MRC
- Input to the IPAD-MD Industry & Innovation Workshop 2016 – Ana de Castro, HMGU

*12:30-13:30 Lunch*

13:30-15:30

- Integration of African partners in the network - Susan Marschall, HMGU
- Invitation external experts to the Expert Group meetings on Standards & Technology (all)
- Inclusion of animal welfare topic on training courses – Lluís Montoliu, CNB-CSIC

### 2. List of Participants

List of Participants		
Abdel Ayadi*	ICS	France
Inken Beck	IMG	Czech Republic
Kent Lloyd	UC Davis	USA
Lluís Montoliu	CNB-CSIC	Spain



## List of Participants

Marcello Raspa, Ferdinando Scavizzi, Raffaele Matteoni	CNR	Italy
Martin Fray, Mo Guan	MRC Harwell	UK
Robert Taft	JAX	USA
Susan Marschall, Ana de Castro*	HMGU	Germany

\* IPAD-MD Expert Group members on Standards & Technology. Participants funded by European Union Horizon 2020 project IPAD-MD Grant Agreement number 653961.

### 3. Topics Discussed:

#### Oocyte & Embryo Vitrification

- Mo Guan presented the technology development aspects (straws vs vials, temperature and time) achieved in the embryo and oocyte vitrification protocol (Nakao et al., 1997) performed at MRC Harwell.
- It was agreed that the improved vitrification method should be promoted by the EMMA nodes as part of the overall change in archiving performance.

#### Oocyte freezing

- Mo Guan described the improvements achieved in the oocyte freezing protocol, which have included simplification steps of relevance for the INFRAFRONTIER and IMPC Consortia.
- Currently the protocol is being validated at MRC Harwell. This will serve as pilot study for application in high throughput conditions. The exchange of material will be done within the EMMA nodes for further testing.

#### Non-Surgical Embryo Transfer (NSET)

- Mo Guan described the advantages and the impact of the methods in relation to the 3 R's as well as the difficulties and consequent low success rate using the Non Surgical Embryo Transfer (NSET)
- Further testing is needed and further developments expected before the method can be applied consortia wide.

### Transcervical Embryo Transfer (TCET)

- Mo Guan described the specificities and the progress achieved in this method at MRC Harwell. Further the cooperation between MRC-Harwell and Elim Springs in terms of product development (device development) were showed and discussed.

### Super ovulation

- Mo Guan presented first studies performed at MRC Harwell regarding the superovulation method (use of eCG combined with IASe) published by Takeo & Nakagata, 2015.
- In spite of the current difficult conditions inherent to this method (eg. distribution of the compound) both MRC and JAX will are currently testing the method.

### Industry & Innovation

- Ana de Castro gave a short summary on the existent partnerships between INFRAFRONTIER/IMPC consortia and Industry partners as well as the achievements from the INFRAFRONTIER/IMPC/UAB Industry Liaison Workshop, Barcelona, 2014. In addition, the objectives of the Industry and Innovation Workshop 2016 were presented and ideas how to better cooperate with industry partners were discussed.
- Several industry and SME's were suggested to be included as show cases/ speakers during the Industry & Innovation Workshop 2016 (s. List)

Production	Archiving	Distribution	Animal Welfare/ Public Affairs
	Elim Springs (Device Development, MRC)	Cryoport (MRC, HMGU, CNR)	Karin Blumer, Novartis International (Scientific Affairs, Policies and PR)
	Somarkinnovations (Tattooing, Device Development, ICS)	World Courier (CSIC)	Novartis International (Chief Ethics, Compliance and Policy Officer)
	Cosmo Bio (on going partnership CSIC)		

## Outreach to Africa

- Susan Marschall gave a brief overview on the current knowledge regarding the African Infrastructures and African user needs, and their use of the EMMA resources. In addition the topics below were discussed.

### **a. Technical Support on Cryopreservation Techniques and 'on site' visit**

- The need for an *in situ* training course has been expressed by the representative of ICGEB & University of Cape Town, Frank Brombacher, during the IPAD-MD Kick Off Meeting (July 2015).
- Therefore IPAD-MD will **send an Expert on Cryopreservation Techniques to Republic of South Africa, Cape Town**, to demonstrate the latest techniques as well as to tackle the technical difficulties there existent.( 2 Quarter 2016)

### **b. Archiving & Distribution of EMMA lines in Africa**

- The interest to act as distribution node of EMMA archived mouse lines in Africa has been expressed by the University of Cape Town to Susan Marschall, HMGU. The topic was discussed among the participants, who are willing to provide support by selecting the lines of interest and consult the EMMA line owners, in order to donate them to University of Cape Town.
- It was nevertheless agreed that the quality of the EMMA services has to be safeguarded. Thus an **'on site visit' according to the EMMA guidelines** will be organized and EMMA nodes delegates will be contacted (when possible simultaneous with the technical support course – 2 Quarter 2016)

### **c. Possibility to organize a Mini Symposium on Cryopreservation Techniques in Cape Town, South Africa.**

- Depending on the experience accumulated during both the IPAD-MD Technical Support and the 'on site' visit by the EMMA delegates the possibility to organize a **Mini Symposium on Cryopreservation Techniques** was discussed.
- **Suggested topics for Mini Symposium:** Reproducibility, Sample Management, Animal Welfare, Vaccines & Therapies

- Other **potential sponsors** beyond IPAD-MD Project: ICGEB (Mauro Giacca, Frank Brombacher), Keds Foundation (Malaria); NHGRI & Gordon Conferences (Jane Peterson); BMBF Bilateral projects between Germany and African countries

**To Do:**

- **Organization: Technical Support on Cryopreservation Techniques & EMMA 'on site visit' (2. Quarter, 2016)**

What	Who	When
Contact ICGEB & University of Cape Town	AC	December 2015
Develop Plan for Technical Support: Agenda/Format, Costs, Number of participants	AC+MG+MF	January 2016
Invite/Get Confirmation from Trainer and EMMA 'on-site' visit delegates	AC	January 2016
Get EMMA 'on site visit' procedure (Michael Hagn, EMMA Project Manager)	AC	January 2016
Contact Frank Brombacher with plan, get further feedback	AC	January 2016
Contact EC Scientific Officer with plan and costs for shifting budget (WP2, WP6)	AC	January 2016
Final Check-up on Technical Support on Cryopreservation Techniques and EMMA 'on site visit'	AC+MG+MF+ 'On site visit' EMMA delegates	February 2016

(AC=Ana de Castro; MG= Mo Guan; MF= Martin Fray, FB= Frank Brombacher; 'on site' visit EMMA delegates: SM= Susan Marschall; MR= Marcello Raspa)

**List of External Experts to IPAD-MD Expert Group Meetings and Workshops**

Name, Affiliation	Expertise Area
Toru Takeo, University Kumamoto, Japan	Technology Development
Naomi Nakagata, University Kumamoto, Japan	Technology Development
Ronald Naumann, MPI, Germany	Management of Research Animal Facilities

### **Inclusion of Animal Welfare in Training Courses**

- Lluís Montoliu has expressed the relevance of including animal welfare topic at the INFRAFRONTIER training courses. The different aspects of animal welfare topic should include:
  - Regulation/ Legislation
  - Anesthesia
  - Ethical concerns on animal experimentation
- In addition it was agreed that emphasis of the future training courses should be set on continuous education. A similar system to the one used by FELASA/ICLAS courses (credits) was discussed.

### **4. Presentations**

The presentations are available for download at:

[www.infrafrontier.eu/internal/ipad-md/expert-group-meetings](http://www.infrafrontier.eu/internal/ipad-md/expert-group-meetings)