Final report

EMBO-ESF Workshop on RNA Quality control

Vienna May 10-13, 2010

Organizers:
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Introduction

It has been long recognized that damaged or improperly folded proteins are quickly targeted to degradation. In contrast, it has only recently become clear that defective mRNAs are also actively directed to rapid degradation. During the last years, new observations lead to the identification of numerous new pathways degrading defective RNAs. Simultaneously, the development of sensitive methods allowed the identification of rare RNAs that represented new types of transcripts whose levels where kept low due to their rapid decay.

These discoveries stimulated research of many laboratories and promoted the development of actions to coordinate and stimulate work in this area. One of them was organized by the European Science Foundation and involved 3 international European networks. Given the increasing interest from researchers emanating from other areas for questions related to RNA Quality controls, the coordinators of the three ESF networks proposed to organize an EMBO Workshop on this topic with additional financial and organizational support provided by ESF. The resulting EMBO-ESF workshop was held in Vienna from May 10 to May 13, 2010.

Speakers

30 speakers were invited to present their work at the workshop. One early cancellation was received as one speaker had committed to two simultaneous events (Steve Cusack). The organizers tried to find short notice replacements.

Speakers were chosen to represent different scientific disciplines and cover as much as possible this dynamic research area. Their distribution by continent of origin and male/female distribution is detailed in the table below.

	Female	Male
Europe	8	13
USA/Canada	2	5
Asia	0	1

All speakers were able to attend except for four of them who cancelled shortly before or during the meeting: Elisa Izaurralde, Stuart Peltz, and Olivier Voinnet. Of note, the activity of the Icelandic volcano was stressing and slightly troublesome as the Vienna airport was due to close the night before the first meeting day, but except for the delay of one of

the US speakers, this finally did not impact significantly on the meeting organization.
Talks were divided in sessions trying to keep related subject together. “Long talks” from invited speakers preceded short oral presentation selected from submitted abstracts (two per sessions). “Long talks” were planned for 20 minutes followed by 10 minutes discussion while short oral presentations were for 10 minutes plus 5 minutes discussion. Overall, the schedule was followed precisely without adding any stress and questions/discussions were very lively.

Attendees

A total of 110 applications (including 30 speakers and 3 organizers) were received. The selection, performed by the three organizers, was essentially based on the motivation that the applicants expressed in the registration forms. Some of the applicants had clearly naïve and erroneous ideas of the main theme of the meeting (e.g. applicants expecting that problems related to poor quality of RNA after extraction from medical samples would be addressed). A total of 65 applicants were selected both due to organizational constraints (housing, meals) and to maintain a meeting size allowing a maximum of contact and discussion between participants. In the selection process, the association of the respective applicant to ESF lab was not taken into account as selection criteria since we wanted to treat all applicants equally.
Attendees originated from a wide geographic distribution and had positions ranging from PhD students to PI and included many post-doctoral trainees (18 PhD students, 39 postdocs and 40 PIs). Interestingly, three applicants were editors of Journals (The EMBO Journal, Nature and Nature Cell Biology review/Nature Structural and Molecular Biology) underlining further the current interest for this area.

Posters and short talks

A total of 10 applicants were selected for oral presentations. Those were selected among the applicant having requested to present orally on the basis of the abstract general relevance and interest for the workshop. Their distribution by continent of origin and male/female distribution is detailed in the table below.

	Female	Male
Europe	3	5
USA/Canada	0	2

Those applicants that had selected to present a poster were able to expose their work on poster board for the duration of the meeting. Posters were located in the hall in from of the lecture room where coffee breaks and finger food were distributed. This allowed for many occasions of discussion beyond the dedicated poster session. A Poster Prize given by EMBO Reports was attributed after selection operated by a committee involving Andrzej Dziembowski (Poland), Stan Gorski (EMBO Journal) and Lars Kristiansen (ESF). The poster presented by Hugo Bretes (Institut Curie, France) on RNA Quality control at the nuclear pore was selected for this prize.

Programme

A copy of the final programme is attached at the end of this document. Replacement speakers are indicated in red.

Local Organization

Local support originated from the group of Michael Kiebler that was deeply and actively involved in the success of this event. This involved particularly Sebastian Butter even though other members of this group also provided help for specific tasks. Additional administrative support involved Anne-Sophie Gablin at ESF supervised by Lars Kristiansen at ESF as well as Lynne Turnbull at EMBO.

Housing was located in two hotels within walking distance from the meeting place. The meeting room at IMBA in Vienna was very convenient and provided sufficient space, good projection and audio facilities. Coffee, posters as well as finger food for one dinner and two lunches were provided in a large open space just adjacent to the meeting room. Internet access was provided in the meeting room and in the poster/coffee room. Catering was provided by the cafeteria of the IMP.

On the last evening of the meeting, an outing to the Heuriger restaurant was organized and offered additional opportunities for discussion.

Outcome

One of the strengths of the meeting was that attendees from different fields that usually do not attend the same event had the possibility to meet and discuss together. This was further reinforced as the meeting occurred in a very good and open atmosphere and the settings provided a wide opportunity for exchanges. The limited size of the meeting together with sufficient time aside from oral presentations left opportunities for students and post-docs to approach and interact with PIs.

EMBO-ESF WORKSHOP ON RNA QUALITY CONTROL

10-13 May 2010, Vienna, Austria

Monday 10 May 2010	
18.00	Registration at the conference venue Finger food dinner
19.45	**Conference Opening** **Michael Kiebler** (Medical University of Vienna, AT)
20.00	Keynote Lecture (Chair Witold Filipowicz) **Joan Steitz** (Yale University, Howard Hughes Medical Institute, New Haven, US)
21.00	Welcome drinks

Tuesday 11 May 2010

Session 1: Quality control of nascent transcripts (Chair Neus Visa)

09.00	**Françoise Stutz** (University of Geneva, CH) *Ubiquitin-mediated mRNP remodeling and surveillance prior to yeast mRNA export*
09.30	**Lars Steinmetz** (European Molecular Biology Laboratory, Heidelberg, DE) *Systems genetics of non-coding RNA*
10.00	**Alain Jacquier** (Institut Pasteur, Paris, FR) *Hidden transcription in yeast and regulation*
10.30	Coffee break
11.00	**Domenico Libri** (CNRS, Centre de Génétique Moléculaire, Gif-sur-Yvette, FR)
11.30	**Nick Proudfoot** (University of Oxford, UK) *Interconnections between gene structure, transcription and pre-mRNA processing*
12.00	**John Lis** (Cornell University, Ithaca, US) *Role of RNA polymerase II in quality control*
12.30	**Catherine Dargemont** (IJM CNRS, Paris, FR) *Role of ubiquitylation in the coordination between 3'end processing and nuclear export of mRNPs*
12.45	**Laura Milligan** (University of Edinburgh, UK) *The Bre5-Ubp3 complex de-ubiquitinates RNA Polymerase II stalled on highly transcribed convergent genes*
13.00	Warm lunch at the cafeteria

Session 2: Translation-linked RNA quality control (Chair Françoise Stutz)

14.00	**Oliver Mühlemann** (University of Bern, CH) *Charcterization of endogenous mRNAs targeted by NMD*
14:30	**Fatima Gebauer** (Centre for Genomic Regulation, Barcelona, ES) *Cytoplasmic polyadenylation during Drosophila embryogenesis*
15.00	**Allan Jacobson** (University of Massachusetts, Worcester, US)

15.30 Coffee break

16.00 **Hervé Le Hir** (CNRS, Centre de Génétique Moléculaire, Gif-sur-Yvette, FR)
The Exon Junction Complex is differentially loaded on spliced junctions

16.30 **Lynne Maquat** (University of Rochester, US)
mRNP Rearrangements During the Pioneer Round of Translation, Nonsense-Mediated mRNA Decay, and thereafter

17.00 **Witek Filipowicz** (Friedrich Miescher Institut for Biomedical Research, Basel, CH)
Regulation of miRNA function and metabolism in mammlian cells

17.30 **Maiken S. Kristiansen** (Centre for mRNP biogenesis and metabolism, Århus, DK)
The human core exosome utilizes differentially localized processive ribonucleases: hDIS3 and hDIS3L

17.45 **Jernej Ule** (MRC LMB, Cambridge, UK)

18.15 **Poster session**

20.00 Finger food dinner

Wednesday 12 May 2010

Session 3: RNP surveillance, transport and localization (Chair Oliver Mühlemann)

09.00 **Rob Singer** (Albert Einstein College of Medicine, New York, US)
Observing RNA quality control at the single molecule level

09.30 **Daniel St. Johnston** (University of Cambridge, UK)
The role of microtubule motors, P bodies and Exu in oskar and bicoid mRNA localisation

10.00 **David Tollervey** (University of Edinburgh, UK)

10.30 Coffee break

11.00 **Isabel Palacios** (University of Cambridge, UK)
Function and mechanism of RNA localization and decay in Drosophila

11.30 **Neus Visa** (Stockholm University, SE)
Co-transcriptional surveillance of mRNA biogenesis in Drosophila

12.00 **Gunter Meister** (MPI for Biochemistry, Martinsried, DE)

12.30 **Gregory Matera** (University of North Carolina, Chapel Hill, US)
Sm proteins specify germ cell fate by facilitating oskar mRNA localization

12.45	**Michael Feldbrügge** (Heinrich-Heine University, Düsseldorf, DE) *Microtubule-dependent mRNA transport in Ustilago maydis*
13.00	Sandwich lunch

Session 4: RNA quality control players: structure and activities, organization in pathways (Chair Hervé Le Hir)

14.00	**Christopher D. Lima** (Sloan-Kettering Institute, New York, US) *Human and yeast RNA exosomes, insights to RNA processing and decay*
14.30	**Elena Conti** (Max Planck Institute of Biochemistry, Martinsried, DE)
15.00	**Michael Kiebler** (replacement for Steve Cusack) *RNA localization in neurons*
15.30	**Andrzej Dziembowski** (Warsaw University, PL) *RNA pathways toward the catalytic centres of the exosome complex*
16.00	Coffee break
16.30	**Hawei Song** (Institute of Molecular and Cell Biology, Proteos, SG) *Structure of the Dom34-Hbs1 Complex and implications for its role in No-Go decay*
17.00	**Peter Lukavsky** (MRC LMB, Cambridge, UK) *A'-form RNA helices drive microtubule-based mRNA transport in Drosophila*
17.15	**Julien Henri** (Yeast structural genomics IBBMC, Orsay, FR) *Dom34-Hbs1 : a complex involved in two quality-control pathways*
17.30	**Poster competition award**
18.15	Departure for Heuriger restaurant by bus
20.00	Official conference dinner

Thursday 13 May 2010

Session 5: RNA quality control at the level of cells and organisms and in diseases (chair Fatima Gebauer)

09.00	**Andrea Barta** (Medical University of Vienna, AT)

	Analysis of Alternative Splicing and NMD in plants
09.30	**Irene Bozzoni** (Replacement for Olivier Voinnet) *Control of miRNA gene expression in Duchenne muscular dystrophy*
9.45	**Javier Caceres** (Western General Hospital, Edinburgh, UK) *miRNA biogenesis in differentiation and cancer*
10.15	Coffee break
10.45	**Allan Jacobson** (Replacement for Stuart Peltz (PTC Therapeutics Inc., South Plainfield, US))
11.15	**Mathias Hentze** (EMBL Heidelberg, DE) *RNA quality control and diseases of altered mRNA metabolism*
11.45	**Karsten Weis** (UC Berkeley, US) *Global analysis of mRNA turnover in budding yeast*
12.00	**Dierk Niessing** (Helmholtz Zentrum München, DE) *The X-ray structure of the neuronal mRNA-transport factor Pur-alpha reveals an unusual RNA-binding domain*
12.30	Sandwich lunch and departure

All posters should be put up by the first evening of the conference and will be on display during the whole duration