

## Curriculum Vitae

### Name & Address

**Michael F. Jantsch** – *Professor of Cell and Developmental Biology*

*Current Position: Group Leader Department of Cell and Developmental Biology*

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### Main Research Interests

We study the mechanisms and consequences of post-transcriptional RNA modifications, with a special focus on those mediated by adenosine deaminases that act on RNA (ADARs). These enzymes deaminate adenosines to inosines in structured regions of RNAs. Inosines, in turn, are recognized as guanosines during translation, splicing, or folding. Consequently ADAR-mediated deaminations can alter the coding potential, splice pattern, or turnover of RNAs. More than a million deamination editing sites are known in the human transcriptome. Mice lacking ADAR1 die prematurely and mutations in human ADAR1 are associated with Aicardi Goutières syndrome a severe interferonopathy. ADAR1 deficiency in mice can be rescued by deletions of viral RNA sensors MDA5 or MAVS. It thus appears that another function of Inosines in endogenous RNAs is to distinguish self- from non-self RNAs. A particular editing event in the Filamin A protein leads to a Q to R amino acid exchange in the encoded protein. Mice in which this amino acid exchange is inhibited show altered cytoskeletal dynamics, also affecting several signaling pathways.

Therefore, in our work we aim at understanding the regulation and consequences of filamin A editing. We also want to decipher the particular RNAs and sensing mechanisms that lead to elevated interferon signaling in the absence of ADARs.

### Scientific Education & Career History

since 2015	Full Professor for Cell- and Developmental Biology, Medical University of Vienna
2001-2015	Associate Professor, University of Vienna
2001	Habilitation in Genetics (assoc. Prof), University of Vienna
1993-2001	Assistant Prof. Dept. of Cell Biology and Genetics University of Vienna
1989-1993	Post Doc, Carnegie Institution of Washington, Baltimore, MD
1988	PhD in Biology, Univ Vienna
1987	Short term fellowship to the Medical University of Lübeck, Germany,
1982-1988	Studies of Biology, University of Vienna

### Experience in Scientific Management and Organization & Student Supervision

Since 1993	Supervision and training of <b>15 Diploma (M.Sc.)</b> , <b>22 PhD</b> students, and 3 Post Docs Awards and fellowships won by lab members: Incoming Postdoctoral fellowship: INDICAR EU cofund (2 x); DFG (German Research Society)(1x) PhD fellowships: DOC - Austrian Academy of Sciences 1x; Best dissertation award (1x)
2005-2007	Member of the study section Biology

2005-2015	Department Head, Chromosome Biology, University of Vienna
2013	Vice chair of the Gordon Research Conference on RNA editing and modification
2015- date	Full Professor and Head of Unit, Medical University of Vienna
Since 2015	Head of Unit for Anatomy and Cell Biology, Medical University of Vienna
Since 2017	Member of the curricular committee for medical studies
2015-2019	Speaker and Coordinator of the Special Research Program "Regulatory RNAs"
2014-2019	Member of the Doctoral Program "RNA Biology"
2014-date	Editorial board, RNA-Biology
2015	Chair of the Gordon Research Conference on RNA editing and modification
2017	Session chair "RNA modification" at the annual RNA society meeting

### Supervision of Doctoral (PhD) Thesis Students (past five years – 22 since 1994)

**Aamira Tariq** - PhD Student 2007-2012

"A screen for inhibitors and activators of RNA editing"

**Silpi Banerjee** - PhD Student 2011-2014

"Nuclear import of a double stranded RNA binding domain"

**Mansoureh Tajaddod** - PhD Student 2011-2015

"Impact of SINES on gene expression"

**Cornelia Vesely** - PhD Student 2009-2013

"Impact of ADAR proteins on microRNA abundance and sequence"

**Maja Stulic** - PhD Student 2012-2016

"Functional consequences of Filamin A pre-mRNA editing"

**Utkarsh Kapoor** - PhD Student 2015-ongoing

"The interplay of RNA editing and splicing"

**Prajakta Bajad** - PhD student 2015-ongoing

"RNAs triggering inflammation in ADAR deficiency"

### Invited Conference Presentations (5 recent selected)

- 2017- Invited speaker at the GRC on RNA editing, Ventura, CA, USA
- 2016 – "The epitranscriptome" EMBO conference, EMBL
- 2016 – Nucleic acids and immunity Brno, Czech republic
- 2015 - Speaker at the Dept. of Biochemistry, Cambridge UK
- 2013 - Plenary speaker at the GRC on RNA editing, Galveston, USA

### Honors & Awards

1987 Austrian Ministry of Science Fellowship to Lübeck

1989-1992 Erwin Schrödinger Fellow of the Austrian Science Foundation FWF

1999 Novartis Prize for Biology, Novartis (Sandoz) Austria

### Member of Reviewing Panels, Editorial Boards, Scientific Organizations (5 selected)

- Regular reviewing for *Science*, *Nature*, *Cell*, *Nat. Struct. Mol. Biol.*, *EMBO J*, *Cell Rep.*, *EMBO Rep.*, *Nucl. Acids. Res.*, *RNA*, *RNA Biol.*, Wellcome Trust, Swiss National Fund, European Research Council, DFG, Israeli Science Foundation
- Editorial Board member of *RNA Biology*
- ASCB member, RNA society member
- COST participant

### **Most Important Research Funding** (selection of past 5 years)

- 2017 – 2021, MOBILIS FWF/ANR - 220 k€
- 2016 – 2019, FWF SFB43 RNA-REG (MFJ coordination) 620 k€
- 2017 – 2020, FWF – participation in doctoral program RNA Biology (FWF) 110 k€
- 2014 – 2017, FWF Impact of editing on splicing 342 k€
- 2014 – 2017, FWF Impact of splicing on editing 320 k€

### **Key International Collaborators** (selection of 5 with joint publications since 2012)

- |                          |                             |                              |
|--------------------------|-----------------------------|------------------------------|
| • <b>Marie Öhman</b>     | Stockholm University, SE    | marie.ohman@su.se            |
| • <b>Mary O Connell</b>  | Ceitec, Brno, CZE           | mary.oconnell@ceitec.muni.cz |
| • <b>Frederic Allain</b> | ETH Zürich, CHE             | allain@mol.biol.ethz.ch      |
| • <b>K V Prasanth</b>    | University of Illinois, USA | kumarp@life.illinois.edu     |
| • <b>Erez Levanon</b>    | Bar Ilan University, ISR    | erez.levanon@biu.ac.il       |

## List of Publications (2012 - 2016)

Overall **61** manuscripts with a cumulative impact factor of **380**. Based on Google scholar publications received more than **4100** citations with a current Hirsch **h Index** of **30**.

1. Tajaddod, M., A. Tanzer, K. Licht, M.T. Wolfinger, S. Badelt, F. Huber, O. Pusch, S. Schopoff, M. Janisiw, I. Hofacker, and **M.F. Jantsch**. 2016;. Transcriptome-wide effects of inverted SINEs on gene expression and their impact on RNA polymerase II activity. **Genome Biol.** 17:220.
2. Anantharaman, A., M. Jadhava, V. Tripathi, S. Nakagawa, T. Hirose, **M.F. Jantsch**, S.G. Prasanth, and K.V. Prasanth. 2016 Paraspeckles modulate the intranuclear distribution of paraspeckle-associated Ctn RNA. **Sci Rep.**;6:34043.
3. Tajaddod M, **Jantsch MF\***, Licht K. 2016 The dynamic epitranscriptome: A to I editing modulates genetic information. **Chromosoma**; 125:51-63. \*corresponding author
4. Licht K, Kapoor U, Mayrhofer E, **Jantsch MF**. 2016; Adenosine to Inosine editing frequency controlled by splicing efficiency. **Nucleic Acids Res** 44:6398-408.
5. Licht K, **Jantsch MF**. 2016; Rapid and dynamic transcriptome regulation by RNA editing and RNA modifications. **The Journal of cell biology** 213:15-22.
6. Daryabeigi, A., A. Woglar, A. Baudrimont, N. Silva, D. Paouneskou, C. Vesely, M. Rauter, A. Penkner, **M. Jantsch**, and V. Jantsch. 2016. Nuclear Envelope Retention of LINC Complexes Is Promoted by SUN-1 Oligomerization in the Caenorhabditis elegans Germ Line. **Genetics**. 203:733-748.
7. Barraud, P., S. Banerjee, W.I. Mohamed, **M.F. Jantsch\***, and F.H. Allain\*. 2014. A bimodular nuclear localization signal assembled via an extended double-stranded RNA-binding domain acts as an RNA-sensing signal for transportin 1. **Proc Natl Acad Sci U S A**. 111:E1852-1861. \*) co-corresponding author
8. Mannion, N.M., S.M. Greenwood, R. Young, S. Cox, J. Brindle, D. Read, C. Nellaker, C. Vesely, C.P. Ponting, P.J. McLaughlin, **M.F. Jantsch**, J. Dorin, I.R. Adams, A.D. Scadden, M. Ohman, L.P. Keegan, and M.A. O'Connell. 2014. The RNA-editing enzyme ADAR1 controls innate immune responses to RNA. **Cell reports**. 9:1482-1494.
9. Muggenheimer, D., C. Vesely, S. Nimpf, N. Tian, J. Yongfeng, and **M.F. Jantsch**. 2014. Drosha protein levels are translationally regulated during Xenopus oocyte maturation. **Mol Biol Cell**. 25:2094-2104.
10. Vesely, C., S. Tauber, F.J. Sedlazeck, M. Tajaddod, A. von Haeseler, and **M.F. Jantsch**. 2014. ADAR2 induces reproducible changes in sequence and abundance of mature microRNAs in the mouse brain. **Nucleic Acids Res**. 42:12155-12168.
11. **Jantsch, M.F.**. Editing the flow of information 2013. **RNA Biol** 10.
12. Tariq, A., Garncarz, W., Handl, C., Balik, A., Pusch, O., and **Jantsch, M.F.** 2013. RNA-interacting proteins act as site-specific repressors of ADAR2-mediated RNA editing and fluctuate upon neuronal stimulation. **Nucleic Acids Res** 41, 2581-2593.
13. Stulic, M., and **Jantsch, M.F.** 2013. Spatio-temporal profiling of Filamin A RNA-editing reveals ADAR preferences and high editing levels outside neuronal tissues. **RNA Biol** 10.
14. Garncarz, W., Tariq, A., Handl, C., Pusch, O., and **Jantsch, M.F.** 2013. A high-throughput screen to identify enhancers of ADAR-mediated RNA-editing. **RNA Biol** 10, 192-204.
15. Tariq, A., and **Jantsch, M.F.** 2012. Transcript diversification in the nervous system: a to I RNA editing in CNS function and disease development. **Front Neurosci** 6, 99.
16. Vesely, C., Tauber, S., Sedlazeck, F.J., von Haeseler, A., and **Jantsch, M.F.** 2012. Adenosine deaminases that act on RNA induce reproducible changes in abundance and sequence of embryonic miRNAs. **Genome Res** 22, 1468-1476.

## 10 Most Important Career Publications (as first or corresponding author)

1. Tajaddod, M., A. Tanzer, K. Licht, M.T. Wolfinger, S. Badelt, F. Huber, O. Pusch, S. Schopoff, M. Janisiw, I. Hofacker, and **M.F. Jantsch**. 2016;. Transcriptome-wide effects of inverted SINEs on gene expression and their impact on RNA polymerase II activity. **Genome Biol.** 17:220.
2. Barraud, P., S. Banerjee, W.I. Mohamed, **M.F. Jantsch**, and F.H. Allain. 2014. A bimodular nuclear localization signal assembled via an extended double-stranded RNA-binding domain acts as an RNA-sensing signal for transportin 1. **PNAS (USA)** 111:E1852-1861.
3. Vesely, C., Tauber, S., Sedlazeck, F.J., von Haeseler, A., and **Jantsch, M.F.** (2012). Adenosine deaminases that act on RNA induce reproducible changes in abundance and sequence of embryonic miRNAs. **Genome Res** 22, 1468-1476.
4. Fritz, J., Strehlow, A., Taschner, A., Schopoff, S., Pasierbek, P., and **Jantsch, M.F.** (2009). RNA-regulated interaction of transportin-1 and exportin-5 with the double-stranded RNA-binding domain regulates nucleocytoplasmic shuttling of ADAR1. **Mol Cell Biol** 29, 1487-1497.
5. Levanon, E.Y., Hallegger, M., Kinar, Y., Shemesh, R., Djinovic-Carugo, K., Rechavi, G., **Jantsch, M.F.**, and Eisenberg, E. (2005). Evolutionarily conserved human targets of adenosine to inosine RNA editing. **Nucleic Acids Res** 33, 1162-1168.
6. Levanon, E.Y., E. Eisenberg, R. Yelin, S. Nemzer, M. Hallegger, R. Shemesh, Z.Y. Fligelman, A. Shoshan, S.R. Pollock, D. Sztybel, M. Olshansky, G. Rechavi, and **M.F. Jantsch**. 2004. Systematic identification of abundant A-to-I editing sites in the human transcriptome. **Nat Biotechnol.** 22:1001-1005.
7. Doyle, M., and **Jantsch, M.F.** (2003). Distinct in vivo roles for double-stranded RNA-binding domains of the Xenopus RNA-editing enzyme ADAR1 in chromosomal targeting. **The Journal of cell biology** 161, 309-319.
8. Eckmann, C.R., and **Jantsch, M.F.** (1999). The RNA-editing enzyme ADAR1 is localized to the nascent ribonucleoprotein matrix on Xenopus lampbrush chromosomes but specifically associates with an atypical loop. **Journal of Cell Biology** 144, 603-615.
9. Eckmann, C.R., and **Jantsch, M.F.** (1997). Xlrpba, a double-stranded RNA-binding protein associated with ribosomes and heterogeneous nuclear RNPs. **Journal of Cell Biology** 138, 239-253.
10. St Johnston, D., Brown, N.H., Gall, J.G., and **Jantsch, M.** (1992). A conserved double-stranded RNA-binding domain. **PNAS (USA)** 89, 10979-10983.