David Teis

Biographical sketch

During my PhD at the Institute of Molecular Pathology (IMP) in Vienna, Austria, in the group of Lukas A. Huber, I could show how the LAMTOR2/3 complex assembles to regulate signaling from MVBs and that this function is essential for mouse embryogenesis and tissue homeostasis. As a postdoc in Scott Emr's lab, I used yeast as a model system to understand the molecular mechanisms leading to the biogenesis of MVBs. In my research group at the Biocenter of the Medical University Innsbruck, we characterize the molecular mechanisms of ESCRT mediated membrane remodeling during MVB biogenesis and identify regulatory networks that control the membrane proteome via the MVB pathway. To address these questions, we are using genetics in yeast and mammalian cells, in combination with quantitative biochemical and imaging approaches and electron tomography.

Curriculum vitae

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Date of birth	6 January 1975
Place of birth	Graz, Austria
Citizenship	Austrian

Education

1993	Matura, Höhere Internatsschule des Bundes (HIB), Graz, Austria
1999	MSc in Microbiology, University of Graz, Austria
2002	PhD in Genetics, Institute of Molecular Pathology (IMP), University of Vienna, Austria

Career History

2002-2005	Research Assistant with Prof. Lukas Huber, Institute for Cell Biology, Innsbruck Medical University
2005-2009	PostDoc with Prof. Scott Emr, UCSD and Weill Institute for Cell and Molecular Biology, Cornell University, USA
since 2009	Groupleader, Biocenter, Division Cell Biology, Innsbruck Medical University
since 2013	Associate Professor and Habilition in Cell Biology
since 2016	Coordinator of the Molecular Cell Biology and Oncology PhD-Program

Fellowships, Awards	EMBO long-term fellowship (2006) HFSP long-term fellowship (2007-2009) START prize (FWF) (2009) HFSP career development award (2011)
Publications	Number of publications=35, h-index=25, cited>2825 average citation per item>79 Google Scholar link
Patents	None

Other Functions Reviewer for: ERC, Welcome Trust, SNF, DFG, ANR and Humboldt-Foundation, Science, eLife, MBoC, EMBO Journal, Journal of Cell Biology, FEBS, Current Biology, Biophysical Journal,
member of COST proteostasis (BM1307)

Research Interests To goal of my research is to provide molecular understanding for the mechanisms that govern the dynamic organization of cells under normal and pathophysiological conditions. We focus on selective membrane protein degradation pathways and try to understand how they integrate with cellular metabolism.

Funds obtained (in €, 5 most important ones)

FWF-START (Y444-B12) (2^{nd} Funding Period)	1.200.000	FWF	2010-2017
HFSP-Career Development Award	230.000	HFSP	2011-2014
Doktoratskolleg (W11), Molecular Cell Biology and Oncology 3^{rd} & 4^{rd} funding period	207.400 & 205.000	FWF, Med. Uni. Innsbruck	2012-2018
FWF Stand alone grant (P29583) Molecular mechanism of nutrient dependent plasma membrane remodeling	350.000	FWF	2016-2019
FWF Stand alone grant (P30263) Dynamics of the ESCRT machinery during multivesicular body biogenesis	399.048	FWF	2017-2020

PhD students since 2013

Name (PhD Program)	Title of PhD thesis	Start	Graduation	publications
Martin Müller (MCB)	Quantitative Proteomic Analysis of multivesicular body sorting	2010	2014	4
Manuel Alonso Y Adell (MCB)	The molecular mechanism of Vps4 mediated ESCRT-III disassembly during MVB vesicle formation	2011	2015	5
Claudia Mattissek (MCB)	The multivesicular body pathway in cellular homeostasis	2011	2015	1
Simona Migliano (MCB)	Molecular mechanism of ESCRT membrane protein degradation and consequences of failure	2013	2017	2
Simon Sprenger (MCB)	The molecular mechanisms of ESCRT-III capping during reverse membrane budding	2015	Planned for 2019	1
Jenny Kahlhofer (MCBO)	Regulation of Nutrient Transporter endocytosis in human cells	2017	ongoing	0
Johannes Zimmer (MCBO)	How cellular metabolism regulates membrane protein degradation	2017	ongoing	0

International collaborators

	Project	**Joint public.**	**lab for stay abroad**
Tomas Kirchhausen (Cell Biology Harvard, Med. School, Boston, USA)	ESCRT dynamics	1	yes

Snezhana Oliferenko (The Francis Crick Institute, London, UK)	ESCRT recruitment at the nuclear envelop	1 manuscript in preparation	yes
Scott Emr (Weill Institute for Cell and Molecular Biology, Cornell University, Ithaca, USA)	Nutrient transporter endocytosis	6	yes

International Network: COST-Proteostasis

10 most important scientific publications

1. Adell MAY*, Migliano SM*, Upadhyayula S*, Bykov YS, Sprenger S, Pakdel M, Vogel GF, Jih G, Skillern W, Behrouzi R, Babst M, Schmidt O, Hess MW, Briggs JA, Kirchhausen T*, **Teis D*.** Recruitment dynamics of ESCRT-III and Vps4 to endosomes and implications for reverse membrane budding. **eLife.** 2017 Oct 11;6. PMID: 29019322. * equal contribution.

2. Huber LA, **Teis D**. Lysosomal signaling in control of degradation pathways. **Curr Opin Cell Biol**. 2016 Apr;39:8-14. PMID: 26827287.

3. Müller M, Schmidt O, Angelova M, Faserl K, Weys S, Kremser L, Pfaffenwimmer T, Dalik T, Kraft C, Trajanoski Z, Lindner H, **Teis D**. The coordinated action of the MVB pathway and autophagy ensures cell survival during starvation. **Elife**. 2015 Apr 22;4:e07736. PMID: 25902403.

4. Adell MA, Vogel GF, Pakdel M, Müller M, Lindner H, Hess MW, **Teis D**. Coordinated binding of Vps4 to ESCRT-III drives membrane neck constriction during MVB vesicle formation. **J Cell Biol**. 2014 Apr 14;205(1):33-49. PMID: 24711499.

5. Schiefermeier N, Scheffler JM, de Araujo ME, Stasyk T, Yordanov T, Ebner HL, Offterdinger M, Munck S, Hess MW, Wickström SA, Lange A, Wunderlich W, Fässler R, **Teis D**, Huber LA. The late endosomal p14-MP1 (LAMTOR2/3) complex regulates focal adhesion dynamics during cell migration. **J Cell Biol**. 2014 May 26;205(4):525-40. PMID: 24841562.

6. **Teis D***, Saksena S, Judson BL, Emr SD*. ESCRT-II coordinates the assembly of ESCRT-III filaments for cargo sorting and multivesicular body vesicle formation. **EMBO J**. 2010 Mar 3;29(5):871-83. PMID: 20134403. * corresponding authors

7. Saksena S, Wahlman J, **Teis D**, Johnson AE, Emr SD. Functional reconstitution of ESCRT-III assembly and disassembly. **Cell**. 2009 Jan 9;136(1):97-109. PMID: 19135892.

8. **Teis D**, Saksena S, Emr SD. Ordered assembly of the ESCRT-III complex on endosomes is required to sequester cargo during MVB formation. **Dev Cell**. 2008 Oct;15(4):578-89. PMID: 18854142.

9. **Teis D**, Taub N, Kurzbauer R, Hilber D, de Araujo ME, Erlacher M, Offterdinger M, Villunger A, Geley S, Bohn G, Klein C, Hess MW, Huber LA. p14-MP1-MEK1 signaling regulates endosomal traffic and cellular proliferation during tissue homeostasis. **J Cell Biol**. 2006 Dec 18;175(6):861-8. PMID: 17178906.

10. **Teis D**, Wunderlich W, Huber LA. Localization of the MP1-MAPK scaffold complex to endosomes is mediated by p14 and required for signal transduction. **Dev Cell**. 2002 Dec;3(6):803-14. PMID: 12479806.

David Teis; all publications since 2013

1. Hovsepian J, Albanèse V, Becuwe M, Ivashov V, **Teis D**, Léon S. The yeast arrestin-related protein Bul1 is a novel actor of glucose-induced endocytosis. **Mol Biol Cell**. 2018 Mar 7. PMID: 29514933.

2. Adell MAY*, Migliano SM*, Upadhyayula S*, Bykov YS, Sprenger S, Pakdel M, Vogel GF, Jih G, Skillern W, Behrouzi R, Babst M, Schmidt O, Hess MW, Briggs JA, Kirchhausen T*, **Teis D*. ** Recruitment dynamics of ESCRT-III and Vps4 to endosomes and implications for reverse membrane budding. **eLife.** 2017 Oct 11;6. PMID: 29019322. * equal contribution.

3. **Teis D**, Kukulski W. Meeting report - Emerging Concepts in Cell Organization. J Cell Sci. 2017 Jul 15;130(14):2229-2233. doi: 10.1242/jcs.206219. Epub 2017 Jul 15. PubMed PMID: 28738320.

4. Schmidt O, Weyer Y, Fink MJ, Müller M, Weys S, Bindreither M, **Teis D.** Regulation of Rab5 isoforms by transcriptional and post-transcriptional mechanisms in yeast. **FEBS Lett**. 2017 Sep;591(18):2803-2815. doi: 10.1002/1873-3468.12785. Epub 2017 Aug 24. PubMed PMID: 28792590.

5. Adell MA, Migliano SM, **Teis D**. ESCRT-III and Vps4: a dynamic multipurpose tool for membrane budding and scission. **FEBS J**. 2016 Feb 22. doi: 10.1111/febs.13688. PMID: 26910595.

6. Curwin AJ, Brouwers N, Alonso Y Adell M, **Teis D**, Turacchio G, Parashuraman S, Ronchi P, Malhotra V. ESCRT-III drives the final stages of CUPS maturation forunconventional protein secretion. **Elife**. 2016 Apr 26;5. PMID: 27115345.

7. Huber LA, **Teis D**. Lysosomal signaling in control of degradation pathways. **Curr Opin Cell Biol**. 2016 Apr;39:8-14. PMID: 26827287.

8. Müller M, Schmidt O, Angelova M, Faserl K, Weys S, Kremser L, Pfaffenwimmer T, Dalik T, Kraft C, Trajanoski Z, Lindner H, **Teis D**. The coordinated action of the MVB pathway and autophagy ensures cell survival during starvation. **Elife**. 2015 Apr 22;4:e07736. PMID: 25902403.

9. Faserl K, Kremser L, Müller M, **Teis D**, Lindner HH. Quantitative proteomics using ultralow flow capillary electrophoresis-mass spectrometry. **Anal Chem**. 2015;87(9):4633-40. PMID: 25839223.

10. Vogel GF, Ebner HL, de Araujo ME, Schmiedinger T, Eiter O, Pircher H, Gutleben K, Witting B, **Teis D**, Huber LA, Hess MW. Ultrastructural Morphometry Points to a New Role for LAMTOR2 in Regulating the Endo/Lysosomal System. **Traffic**. 2015 Jun;16(6):617-34. PMID: 25677580.

11. Schiefermeier N, Scheffler JM, de Araujo ME, Stasyk T, Yordanov T, Ebner HL, Offterdinger M, Munck S, Hess MW, Wickström SA, Lange A, Wunderlich W, Fässler R, **Teis D**, Huber LA. The late endosomal p14-MP1 (LAMTOR2/3) complex regulates focal adhesion dynamics during cell migration. **J Cell Biol**. 2014 May 26;205(4):525-40. PMID: 24841562.

12. Adell MA, Vogel GF, Pakdel M, Müller M, Lindner H, Hess MW, **Teis D**. Coordinated binding of Vps4 to ESCRT-III drives membrane neck constriction during MVB vesicle formation. **J Cell Biol**. 2014 Apr 14;205(1):33-49. PMID: 24711499.

13. Mattissek C, **Teis D**. The role of the endosomal sorting complexes required for transport (ESCRT) in tumorigenesis. **Mol Membr Biol**. 2014 Jun;31(4):111-9. PMID: 24641493.