Ludger Hengst

Biographical sketch

During my PhD in the group of Dieter Gallwitz at the Max-Planck-Institute for Biophysical Chemistry in Göttingen, Germany, I identified and characterized ras-related GTP-binding proteins in the fission yeast *Schizosaccharamyces pombe* and bakers yeast *Saccharomyes cerevisiae*. During these PhD studies I joined the group of Paul Nurse at the University of Oxford, to become familiar with fission yeast genetics and cell biology. As a postdoctoral fellow with Steven I. Reed at the Scripps Research Institute in La Jolla, California, USA, I studied cell cycle control mechanisms in mammalian cells and discovered, purified and characterized the CDK inhibitor $p27^{Kip1}$. In 1998, I moved to the Max-Planck-Institute of Biochemistry in Martinsried near Munich to become an independent junior group leader, studying cell proliferation and cell cycle control in mammalian cells. In 2005, I was appointed as Professor of Medical Biochemisty to the Innsbruck Medical University. Research in my lab focuses on mechanisms that control the cell cycle during the decision between cell proliferation and cell cycle exit in normal and cancer cells. We also study posttranscriptional mechanism in cell cycle control, including ubiquitin modifications or translational control.

Curriculum vitae

Biozentrum der Medizinischen Universität Innsbruck
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Email: ludger.hengst@i-med.ac.at
ORCID: 0000-0002-0605-0223

Date of birth	February 9th, 1963
Place of birth	Wimbern, Germany
Citizenship	German

Education and

1983-1988	Study of Biology, Phillipps University Marburg, Germany. Diploma.
1988-1992	PhD thesis in Biology, Max-Planck-Insitute of Biophysical Chemistry, Göttingen, Germany.

Career History

1992	Research Assistant with Dieter Gallwitz, Max-Planck-Insitute of Biophysical Chemistry, Göttingen, Germany.
1992-1998	PostDoc and Senior Research Assistant with Steven I. Reed, The Scripps Research Institute, La Jolla, CA, USA
1998-2005	Independent Junior Group Leader, Max-Planck-Institute of Biochemistry, Martinsried near Munich, Germany.
since 2005	Professor for Medical Biochemistry, Innsbruck Medical University, Austria

Fellowships, Awards

1989	EMBO short-term fellowship, Oxford University, with Paul Nurse
1992-1994	Research Fellowship of the German Research Fund, DFG
1994-1997	Special Fellowship Award, Leukemia Society of America
2009	Binder Award, German Society for Cell Biology

Publications

Number of publications=77, h-index=32, cited>7450
average citation per item>90
Google Scholar link

Patents Tyrosine-phosphorylation of CDK inhibitors of the Cip/Kip family.
PCT / EP 2004 / 011860

Referee for Nature, Cell, Cancer Cell, Nature Cell Biology, Nature Communications, Genes & Development, PNAS, Blood, Molecular Biology of the Cell, EMBO Reports, Journal of Biological Chemistry, FEBS Letters, Oncogene, Nucleic Acids Research, Molecular Cancer Research, Genome Biology, Molecular Biology of the Cell, European Journal of Cell Biology, International Journal of Cancer, Cancer Cell International, International Journal of Pathology, Molecular Cancer Therapeutics, BioMedCentral Cell Biology, Journal of Vascuolar Research, Trends in Cell Biology, International Journal of Molecular Sciences; Critical Reviews in Biochemistry and Molecular Biology.
Association for International Cancer Research, Canadian National Cancer Institut, Deutsche Forschungsgemeinschaft (DFG), German-Israeli Foundation (GIF), Jubiläumsfonds der österreichischen Nationalbank, Foundation against Cancer, Belgium, Czech Science Foundation: Foreign Rapporteur since 2015.

Editorial Board Memberships Cell Communication and Signaling
The Scientific World Journal (TSW) – Cell Biology

Board Member Austrian Science Fund (FWF): Cell Biology, since 2012

Research Interests Analysis of the molecular mechanisms that determine the decision between cell proliferation and cell cycle exit. Role of Cdk inhibitory proteins in controlling cell proliferation and cell migration. Cell cycle regulation by mitogens and antiproliferative signals. Translational control of cell cycle regulatory proteins. Mechanisms of Cap-independent translation.

Funds obtained (in €, 5 most important ones)

SFB021 (F2115), Cell proliferation and cell death in tumors	348.450	FWF	2009-2011
FWF Stand Alone Project P18873	357.164	FWF	2006-2011
FWF Stand Alone Project P18873	342.412	FWF	2011-2017
EPO-Can **EU FP7 Project**	173.466	EU	2011-2014
Doktoratskolleg (W11), Molecular Cell Biology and Oncology 2rd to 4rd funding period	132.580 207.400 & 205.000	FWF, Med. Uni. Innsbruck	2009-2018

PhD students since 2013

PhD Student	PhD Thesis	Start	Defense	Paper
Silvio PODNIRSEK	Functional analysis of p27-Kip1 modifications after DNA damage and during apoptosis	2010	2015	3
Martina ROILO	Regulation of p27 translation by the cold-induced protein CIRP	2010	2018	1
Ines Peschl (MO)	FLT3 and FLT3-ITD inactivate p27 by direct tyrosine phosphorylation	2011	2018	2
Alessia MASUCCIO	A novel pathway of Skp2 degradation	2012	2018	1
Fraga PEGKA	Regulation of p27 by the EPOR pathway	2015	ongoing	0

International collaborators

	Project	Joint public.	lab for stay abroad
Matthias Peter (ETH Zürich)	In vitro ubiquitination of Skp2	0	yes
Richard W. Kriwacki (St. Jude Hospital, Memphis, USA)	NMR structural analysis	3	No

Ludger Hengst; 10 most important scientific publications

1. **Hengst, L**., Dulic, V,. Slingerland, JM., Lees, E. and Reed SI. (1994). A cell cycle-regulated inhibitor of cyclin-dependent kinases. **Proc. Natl. Acad. Sci.** USA., 91. 5291-5295.

2. **Hengst, L**. and Reed, S.I. (1996). Translational control of $p27^{Kip1}$ accumulation during the cell cycle. **Science**, 271. 1861-1864.

3. **Hengst, L**., Göpfert, U., Lashuel, H. A. and Reed, S.I. (1998). Complete inhibition of Cdk/Cyclin by one molecule of $p21^{Cip1}$. **Genes & Development** 12, 3882-3888.

4. Kullmann M., Göpfert, U., Siewe, B. and **Hengst, L**. (2002). ELAV/Hu proteins inhibit p27 translation through an IRES element in the p27 5'UTR. **Genes & Development** 16, 3087-3099.

5. Grimmler, M., Wang, Y., Mund, T., Cilensek, Z., Keidel, E.M., Waddell, M.B., Jäckel, H., Kullmann, M., Kriwacki, R.W. and **Hengst, L**. (2007). The Cdk-inhibitory activity and stability of $p27^{Kip1}$ are directly regulated by oncogenic tyrosine kinases. **Cell**, 128, 269 - 280.

6. Chu, I.M.; Sun, J., Arnaout, A, Kahn, H., Hanna, W., Narod, S., Sun, P., Keat-Tan, C.; **Hengst, L**. and Slingerland J. M. (2007). p27 phosphorylation by Src regulates inhibition of Cyclin E / Cdk2 and p27 proteolysis. **Cell**, 128, 281-294.

7. Jäkel, H., Weinl, C. and **Hengst, L**. (2011). Phosphorylation of p27-Kip1by JAK2 directly links cytokine signaling to cell cycle control. **Oncogene**, 30, 3502-3512.

8. Vosper J, Masuccio A, Kullmann M, Ploner C, Geley S, **Hengst, L**. (2015). Stain- induced depletion of geranylgeranyl pyrophosphate inhibits cell proliferation by a novel pathway of Skp2 degradation. **Oncotarget** 6 (5): 2889-2902.

9. Podmirsek, S.R., Jäkel, H., Ranches, G.D., Kullmann, M.K., Sohm, B., Villunger A., Lindner H. and **Hengst, L**. (2016). "Caspases uncouple p27Kip1 from cell cycle regulated degradation and abolish its ability to stimulate cell migration and invasion" **Oncogene**, 35: 4580-4590.

10. Roilo, M, Kullmann, M and **Hengst, L**. (2018). "Cold-inducible RNA-binding protein (CIRP) induces translation of the cell cycle inhibitor $p27^{Kip1}$." **Nucleic Acid Res**. 46 (6): 3198-3201.

Ludger Hengst; all publications since 2013

1. Roilo, M, Kullmann, M and **Hengst, L**. (2018). "Cold-inducible RNA-binding protein (CIRP) induces translation of the cell cycle inhibitor $p27^{Kip1}$." **Nucleic Acid Res**. 46 (6): 3198-3201.

2. Chan , K.K., Matchett K, , Coulter, J., Yuen, HF, McCrudden, C., Zhang, SD, Irwin, G., Davidson, M., Rulicke, T., Schober, S., **Hengst, L**., Jaekel, H., Platt-Higgins, A., Rudland, P., Mills, K., Maxwell, P., El-Tanani, M. and Lappin, T. (2017). "Erythropoietin drives breast cancer progression by activation of its receptor EPOR". **Oncotarget** 8 (24): 38251-38263.

3. Peschel, I., Taschler, M., Duyster, J., Götze, K.S., Sill, H., Nachbauer, D., Jäkel, H. and **Hengst, L**. (2017). "FLT3 and FLT3-ITD phosphorykate and inactivate the CDK inhibitor $p27^{Kip1}$ in acute myeloid leukemia". **Haematologica** 102 (8):1378-1389.

4. Podmirsek, S.R., Jäkel, H., Ranches, G.D., Kullmann, M.K., Sohm, B., Villunger A., Lindner H. and **Hengst, L.** (2016) "Caspases uncouple p27Kip1 from cell cycle regulated degradation and abolish its ability to stimulate cell migration and invasion" **Oncogene**, 35: 4580-4590.

5. Vosper J, Masuccio A, Kullmann M, Ploner C, Geley S, **Hengst L.** (2015). Stain- induced depletion of geranylgeranyl pyrophosphate inhibits cell proliferation by a novel pathway of Skp2 degradation. **Oncotarget** 6 (5): 2889-2902.

6. Maxwell P1, Melendez-Rodríguez F, Matchett KB, Aragones J, Ben-Califa N, Jaekel H, **Hengst L**, Lindner H, Bernardini A, Brockmeier U, Fandrey J, Grunert F, Oster HS, Mittelman M, El-Tanani M, Thiersch M, Schneider Gasser EM, Gassmann M, Dangoor D, Cuthbert RJ, Irvine A, Jordan A, Lappin T, Thompson J, Neumann D. (2015). Novel antibodies directed against the human erythropoietin receptor: creating a basis for clinical implementation. **Br J Haematol**. 168 (3): 429 – 442.

7. Bisteau X, Paternot S, Colleoni B, Ecker K, Coulonval K, De Groote P, Declercq W, **Hengst L**, Roger PP. (2013). CDK4 T172 phosphorylation is central in a CDK7-dependent bidirectional CDK4/CDK2 interplay mediated by p21 phosphorylation at the restriction point. **PLoS Genet**. 2013 May;9(5):e1003546. doi: 10.1371/journal.pgen.1003546.

8. Kullmann MK, Grubbauer C, Goetsch K, Jäkel H, Podmirseg SR, Trockenbacher A, Ploner C, Cato AC, Weiss C, Kofler R, **Hengst L**. (2013). The p27-Skp2 axis mediates glucocorticoid-induced cell cycle arrest in T-lymphoma cells. **Cell Cycle** 12 (16): 2625 - 2635.

9. Kern F, Stanika RI, Sarg B, Offterdinger M, Hess D, Obermair GJ, Lindner H, Bandtlow CE, **Hengst L**, Schweigreiter R. (2013). Nogo-A couples with Apg-1 through interaction and co-ordinate expression under hypoxic and oxidative stress. **Biochem J**. 455 (2): 217 - 227