

WONYUL JANG (장원열), Ph.D.

Curriculum Vitae

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EDUCATION AND TRAINING

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|-------------------|--|
| 06.2018 - present | Postdoctoral researcher in Molecular Physiology and Cell Biology, Leibniz-Forschungsinstitut für Molekulare Pharmakologie (FMP) Berlin, Germany (Supervisor: Dr. Volker Haucke) |
| 03.2017 - 05.2018 | Postdoctoral researcher in Biological Sciences, Korea Advanced Institute of Science and Technology (KAIST) Daejeon, Korea (Supervisor: Dr. Dae-Sik Lim) |
| 03.2013 - 02.2017 | Ph.D. in Biological Sciences, Korea Advanced Institute of Science and Technology (KAIST) Daejeon, Korea (Supervisor: Dr. Dae-Sik Lim) |
| 03.2011 - 02.2013 | M.S. in Biological Sciences, Seoul National University, Seoul, Korea (Supervisor: Dr. Kunsoo Rhee) |
| 03.2004 - 02.2010 | B.S. in College of Agriculture and Life Science, Applied Biology, Seoul National University, Seoul, Korea |

PUBLICATIONS

- **Wonyul Jang**, Dmytro Puchkov, Paula Samsó, YongTian Liang, Michal Nadler-Holly, Stephan J. Sigrist, Ulrich Kintscher, Fan Liu, Kamel Mamchaoui, Vincent Mouly, Volker Haucke. (2022). Endosomal lipid signaling reshapes the endoplasmic reticulum to control mitochondrial function. **Science**, 378, 6625. (IF: 63.71)
 - *Highlighted in:*
M. Zanellati and S. Cohen. (2022) The endosome as engineer. **Science** (Perspective), 378, 6625 (1173-1174).
 - *Contribution:* As a single first author of the work, I conceived the project, planned and performed all experiments and data analysis and wrote the paper.
- **Wonyul Jang***, Jeongsik Kim*, Dahyun Kim, Sang-Hee Lee, and Dae-Sik Lim
Formation of a giant unilocular vacuole promotes the survival of mammary epithelial cells after loss of matrix attachment (*co-first author, under revision in *Proceedings of the National Academy of Sciences (PNAS)*, 2023)
 - *Abstract:* The stress associated with loss of attachment to the extracellular matrix (ECM)

usually induces a form of programmed cell death known as anoikis in epithelial cells. However, some cancer cells circumvent such a response and survive by engaging in cell-cell adhesion. The intracellular F-actin cytoskeleton plays a key role in sensing the loss of cell-ECM attachment, but how its disruption affects cell fate during such stress is not well understood. Here we reveal a cell survival strategy characterized by formation of a giant unilocular vacuole (GUVac) in human mammary epithelial cells whose actin cytoskeleton is acutely disrupted during the loss of matrix attachment. Time-lapse imaging and electron microscopy revealed that large vacuoles with a diameter of >500 nm accumulated early after inhibition of actin polymerization in cells in suspension culture, and that these vacuoles subsequently coalesced to form a GUVac. GUVac formation was found to be mediated by an unconventional type of macropinocytosis dependent on F-actin depolymerization and class II and III phosphatidylinositol 3-kinases. Cells defective in GUVac formation were susceptible to anoikis. Our results thus show that formation of a previously unrecognized organelle promotes cell survival in the face of altered actin and matrix environments.

• *Contribution:* As a co-first author of the work, I conceived the work, planned and performed experiments and data analysis and wrote the paper with J.K. and D.L.

- York Posor*, **Wonyul Jang***, Volker Haucke. (2022). Phosphoinositides as membrane organizers. **Nat Rev Mol Cell Biol**, 1-20. (*equal contribution) (IF: 113.9)

• *Contribution:* As a co-first author of the work, I conceived and wrote the part of the autolysosomal system and membrane contact site, and illustrated the draft of figures.

- Mouhannad Malek, Anna M. Wawrzyniak, Peter Koch, Christian Luchtenborg, Manuel Hessenberger, Timo Sachsenheimer, **Wonyul Jang**, Britta Brügger, Volker Haucke. (2021). Inositol triphosphate-triggered calcium release blocks lipid exchange at endoplasmic reticulum-Golgi contact sites. **Nat Commun**, 12, 2673. (IF: 17.69)

• *Contribution:* I helped conceiving the study, performed membrane contact site experiments.

- **Wonyul Jang**, Tackhoon Kim, Ja Seung Koo, Sang-kyum Kim and Dae-Sik Lim. (2017). Mechanical cue-induced YAP instructs Skp2-dependent cell cycle exit and oncogenic signaling. **EMBO Journal**, 36(17):2510-2528. (IF: 10.6)

• *Highlighted in:*

R. T. Bottcher, Z. Sun, R. Fassler (2017) A forceful connection: mechanoregulation of oncogenic YAP. **EMBO Journal** (News and Views), 36(17): 2467-2469.

• *Contribution:* As a single first author of the work, I conceived the project, planned and performed all experiments and data analysis and wrote the paper.

- Mi Young Seo*, **Wonyul Jang***, and Kunsoo Rhee. (2015). Integrity of the Pericentriolar Material Is Essential for Maintaining Centriole Association during M Phase. **PLOS ONE**, 10(9), e0138905. (*co-first author) (IF: 3.24)

• *Contribution:* As a co-first author of the work, I conceived the work, planned and performed experiments and data analysis with M.S. and K.R.

FELLOWSHIPS / AWARDS / HONORS

2019	Leibniz-German Academic Exchange Service (DAAD) Research Fellowship
2018	Post-doctoral Fellowship, National Research Foundation of Korea
2017	Young Scientist Award Cell cycle & Cilia Joint Symposium, Korea

2016	Excellent Poster Awards International Conference of the Korean Society for Molecular and Cellular Biology, Korea
2010	Graduated with honors (Cum laude). Seoul National University, Seoul, Korea
2004 - 2010	National Science and Engineering Scholarship, Korea

CONFERENCES AND PRESENTATIONS

2023	<u>Invited Talk</u> : Chonnam National University Medical School, Korea (Virtual)
2023	<u>Invited Talk</u> : 4th International Symposium Membranes and Modules, Germany
2023	<u>Invited Talk</u> : Seoul National University, Department of Biological Science, Korea (Virtual)
2022	<u>Invited Talk</u> : Marthe-Vogt Friday seminar, Leibniz-Forschungsinstitut für Molekulare Pharmakologie (FMP), Germany
2017	<u>Conference Poster</u> : Glyco24, 24th International Symposium on Glycoconjugates, Korea
2017	<u>Talk</u> : Korean Society for Molecular and Cellular Biology, Cell cycle & Cilia joint Symposium, Korea
2016	<u>Conference Poster</u> : International Conference of the Korean Society for Molecular and Cellular Biology, Korea
2012	<u>Talk</u> : Seoul National University, Science Research Center Symposium, Korea

RESEARCH INTEREST

Remodeling organelle dynamics during cell lineage differentiation

Membrane trafficking and lipid signaling

Relationship between endoplasmic reticulum and nuclear envelope

Organelle dysfunction in human disease

Evolution of organelles in single-celled organism (protist)

TEACHING AND MENTORING EXPERIENCE

2022	Practical course (Biochemistry Part) for undergraduate students in Freie Universität Berlin, Germany. - For this, I independently organized new experimental programs and
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supervised students with aims to explore the composition of membrane contact site (MCS) between endoplasmic reticulum and lysosome via proximity biotin labeling system in different environmental stimuli. Throughout this course, students have learned not only the important concept of organelle communication via MCS in the cells, but also experimental approaches to understand MCS.

- 2019 **Graduate Student Research Assistants' Mentor**
 - Hoonsung Cho (Freie Universität Berlin, Germany). The organelle labeling systems he established under my supervision were generally used in the Haucke Lab.
- 2016 **TA, General Biology**, Department of Biological Sciences, KAIST
- 2015 **TA, Biochemistry Experiment**, Department of Biological Sciences, KAIST
- 2012 **TA, Experimental Biology**, Department of Biological Sciences, Seoul National University

CAREER BREAKS

- 04.2010 – 08.2010 Broadcasting Assistant Producer (AD),
 Korea Natural Documentary Film Association, Korea
- KBS Environment Special (환경스페셜), “Growing the Seeds of Life in National Parks (국립공원 생명의 씨앗이 되다)”, aired on October 6, 2010
 <https://www.youtube.com/watch?v=B0SqEFewgmY&t=1291s>
- 2006 - 2008 Mandatory Military service, Republic of Korea Army, Korea