

RGC Reference CUHK2/CRF/11G
<i>please insert ref. above</i>

**The Research Grants Council of Hong Kong
Collaborative Research Fund Group Research Projects
Completion Report**

(for completed projects only)

Part A: The Project and Investigator(s)**1. Project Title**

EXPO (Exocyst-positive Organelle): Dynamics, Biogenesis and Function in Plants

2. Investigator(s) and Academic Department/Units Involved *(please highlight approved changes in the composition of the project team and quote the date when RGC granted approval of such changes)*

Research Team	Name/Post	Unit/Department/Institution	Average number of hours per week spent on this project in the current reporting period
Project Coordinator	Jiang, Liwen Professor	School of Life Sciences CUHK	14
Co-Principal investigator(s)	Wong, Kam-bo Professor	School of Life Sciences CUHK	4
	Kwan, Kin-ming Associate Professor	School of Life Sciences CUHK	4
	Zhang, Jianhua Professor	School of Life Sciences CUHK	4
	Chan, Raymond Hon-fu Professor	Department of Mathematics CUHK	4
	Yao, Xiaoqiang Professor	School of Biomedical Sciences CUHK	4
	Xia, Jun Associate Professor	Division of Life Science HKUST	4
	Li, Ning Professor	Division of Life Science HKUST	4
	Xia, Yiji Professor	Department of Biology HKBU	4

CRF 8G (Revised Sep 15)

	Chye, Mee Len Professor	School of Biological Sciences HKU	4
Collaborators/ Others			

3. Project Duration

	Original	Revised	Date of RGC Approval (<i>must be quoted</i>)
Project Start Date	15-Jun-2012		
Project Completion Date	14-Jun-2015		
Duration (<i>in month</i>)	36 months		
Deadline for Submission of Completion Report	14-Jun-2016		

Part B: The Final Report

5. Project Objectives

5.1 Objectives as per original application

1. To study EXPO dynamics and EXPO-PM fusion in transgenic living cells;
2. To identify and study EXPO cargo and membrane proteins via EXPO isolation and proteomic analysis;
3. To study membrane origins and biogenesis of EXPO;
4. To identify and study the nature of E2-interacting protein complex and its roles in EXPO-mediated secretion; and
5. To study the possible functions of EXPO in Arabidopsis plants.

5.2 Revised objectives

Date of approval from the RGC: N/A

Reasons for the change: N/A

- 1.
- 2.
3.

6. Research Outcome

6.1 Major findings and research outcome

(maximum 1 page; please make reference to Part C where necessary)

- 1) We have demonstrated that EXPO and autophagosomes are distinct from one another in normally growing cells. However, EXPO as well as autophagosomes fuse with the vacuole and overlap with each other to a significant degree after autophagic induction. This novel finding opens up a new research direction on the crosstalk between EXPO and the autophagic pathway in plants in future research.
- 2) With the combination of transient expression, confocal microscopy and immunogold transmission electron microscopy (TEM) techniques, we have demonstrated that a number of exocyst subunits are recruited to EXPO by AtExo70E2 as well as AtExo70E2 is also capable of inducing EXPO formation in an animal cell line. These results point to a specific and crucial role for AtExo70E2 in EXPO formation. Our study thus provides the evidence for a plant-specific exocyst complex in EXPO-mediated protein secretion in plants.
- 3) Using live cell imaging of transgenic cells/plants, we have demonstrated that EXPO are highly dynamics organelles and their mobility is actin-dependent in plant cells. Using subcellular fractionation and immuno-purification, we have also isolated enriched EXPO fractions for proteomic analysis with cargo identification and further characterization. We are now in the process of preparing two manuscripts which focus on the proteomic analysis and dynamic study of EXPO respectively.

We have also carried out related research in organelle dynamics and biogenesis:

- 4) We have demonstrated and illustrated the underlying mechanism of a unique plant pair of COPII machinery (AtSar1a and AtSec23a) function in ER export in eukaryotes.
- 5) We have demonstrated the multiple functions of a plant unique FYVE domain containing protein FREE1 (FYVE domain protein required for endosomal sorting 1) in regulating a) plant growth and development; b) MVB biogenesis and vacuolar sorting of membrane proteins; c) vacuolar protein transport and autophagic degradation; and d) cross talk with the autophagic pathway via interacting with the autophagosome regulator SH3P2.

Taken together, we have achieved all the original goals of this project with excellent publications in international journals including PNAS, Current Biology, Plant Cell, Plant Journal, Plant Physiology, Molecular Plant, Journal of Experimental Botany and Trends in Plant Science.

In addition, with partially support from this project, we have also trained several very good postgraduate students with excellent research outputs as demonstrated by publications of their thesis work in international journals. and two of them are successfully selected by national professional program “One Thousand Youth Talent Plan” to become faculties in Mainland China in 2016.

6.2 Potential for further development of the research and the proposed course of action
(*maximum half a page*)

- 1) Different organelles in a cell contain different lipids compositions and protein constitutes, which maintain the organelle integrity and functional specificity. Thus the findings and publications about the dynamics, biogenesis and function of EXPO, as well as the related protein trafficking pathways from this project will serve as the basic foundation and new directions for future study of protein trafficking and organelle biogenesis in plant cells.
- 2) Based on our findings, we will further develop our future research program into understanding the underlying mechanisms of the protein secretion pathway especially for unconventional protein secretion (UPS) pathway among different organisms including plant, mammal and yeast in the future.
- 3) This new research of EXPO and its potential usefulness in understanding the function of UPS in plants can be further enhanced and promoted via international collaboration with leaders in both yeast and animal fields.
- 4) The function analysis of Exo70E2 and EXPO will be helpful to understand the physiological functions of different exocyst subunits especially different Exo70s in plants under different stress conditions in future studies.

6.3 Research collaboration achieved (*please give details on the achievement and its relevant impact*)

This CRF project has also promoted national and international collaboration with excellent outputs, such as University of Heidelberg, Chinese Academy of Sciences, University of Tübingen, University of California Riverside, and University of California at Berkeley.

Collaborator	Joint Publication
Robinson DG (University of Heidelberg)	<ul style="list-style-type: none">● Unconventional Protein Secretion. <i>Trends in Plant Science</i> 17: 606-615.● Exo70E2 is essential for exocyst subunit recruitment and for EXPO formation in both plants and animals. <i>Molecular Biology of the Cell</i>. 25(3): 412-426.● Retention mechanisms for ER and Golgi membrane proteins. <i>Trends in Plant Science</i> 19(8): 508-515.● Unconventional Protein Secretion (UPS) pathways in plants. <i>Current Opinion in Cell Biology</i> 29: 107-115.

	<ul style="list-style-type: none"> ● Exocyst-Positive Organelles and Autophagosomes Are Distinct Organelles in Plants. <i>Plant Physiology</i> 169(3):1917-32. ● Unconventional protein secretion in plants: a critical assessment. <i>Protoplasma</i> 253(1): 31-43.
Lin Hong-Xuan (Chinese Academy of Sciences)	<ul style="list-style-type: none"> ● The novel quantitative trait locus <i>GL3.1</i> controls rice grain size and yield by regulating <i>Cyclin-T1;3</i>. <i>Cell Research</i> 22: 1666-1680. ● A two-locus interaction causes interspecific hybrid weakness in rice. <i>Nature Communications</i> 5: 3357.
Pimpl Peter (University of Tuebingen)	<ul style="list-style-type: none"> ● Organelle pH in the Arabidopsis Endomembrane System. <i>Molecular Plant</i> 6: 1419-1437
Chen Xuemei (University of California Riverside)	<ul style="list-style-type: none"> ● MicroRNAs inhibit the translation of target mRNAs on the endoplasmic reticulum in <i>Arabidopsis</i>. <i>Cell</i> 153: 562-574. ● Fast-suppressor screening for new components in protein trafficking, organelle biogenesis and silencing pathway in <i>Arabidopsis thaliana</i> using DEX-inducible FREE1-RNAi plants. <i>The Journal of Genetics and Genomics</i> 42(6):319-330.
Nakano Akihiko (University of Tokyo)	<ul style="list-style-type: none"> ● ARA7(Q69L) expression in transgenic Arabidopsis cells induces the formation of enlarged multivesicular bodies. <i>Journal of Experimental Botany</i> 64: 2817-2829. ● Activation of the Rab7 GTPase by the MON1-CCZ1 complex is essential for PVC-to-vacuole trafficking and plant growth in <i>Arabidopsis</i>. <i>Plant Cell</i> 13(26): 2080-97.
Rojo Enrique (Consejo Superior de Investigaciones Científicas, Spain)	<ul style="list-style-type: none"> ● An in vivo expression system for the identification of native cargo proteins of vacuolar sorting receptors in Arabidopsis culture cells. <i>The Plant Journal</i> 75: 1003-1017. ● N-linked glycosylation of AtVSR1 is important for vacuolar protein sorting in Arabidopsis. <i>The Plant Journal</i> 80: 977-992.
Cheung Alice Y (University of Massachusetts)	<ul style="list-style-type: none"> ● Apical F-Actin Regulated Exocytic Targeting of NtPPME1 is Essential for Pollen Tube Cell Wall Construction and Rigidity. <i>The Plant Journal</i> 76(3): 367-379.
Schekman Randy W (University of California at Berkeley)	<ul style="list-style-type: none"> ● Unique COPII component AtSar1a/AtSec23a pair is required for the distinct function of protein ER export in <i>Arabidopsis thaliana</i>. <i>Proceedings of the National Academy of Sciences of the United States of America</i> 12(46):14360-5.

7. The Layman's Summary

(describe in layman's language the nature, significance and value of the research project, in no more than 200 words)

This RGC-funded CRF project aims to study the different biological aspects of a newly identified organelle termed EXPO (Exocyst-positive Organelle), including its dynamics, biogenesis and function in plants, using a combination of cellular, biochemical and molecular approaches. Results derived from this study have provided new insights about the molecular machinery in regulating unconventional protein secretion in plants, with potential functional implications in plant defense and stress responses in future studies.

Part C: Research Output**8. Peer-reviewed journal publication(s) arising directly from this research project**

(Please attach a copy of the publication and/or the letter of acceptance if not yet submitted in the previous progress report(s). All listed publications must acknowledge RGC's funding support by quoting the specific grant reference.)

The Latest Status of Publications				Author(s) (denote the corresponding author with an asterisk*)	Title and Journal/Book (with the volume, pages and other necessary publishing details specified)	Submitted to RGC (indicate the year ending of the relevant progress report)	Attached to this report (Yes or No)	Acknowledged the support of RGC (Yes or No)	Accessible from the institutional repository (Yes or No)
Year of publication	Year of Acceptance (For paper accepted but not yet published)	Under Review	Under Preparation (optional)						
2012				Ding Y, Wang J, Wang JQ, Stierhof YD, Robinson DG, and *Jiang L	Unconventional Protein Secretion. <i>Trends in Plant Science</i> 17: 606-615. (invited review)	2013	Yes http://www.science.direct.com/science/article/pii/S1360138512001306	No This publication is originated from this CRF grant but the acknowledgement was regrettably overlooked.	No
2012				Qi P, Lin Y, Song X, Shen J, Huang W, Shan J, Zhu M, Jiang L, Gao J and *Lin H.	The novel quantitative trait locus <i>GL3.1</i> controls rice grain size and yield by regulating <i>Cyclin-T1</i> ;3. <i>Cell Research</i> 22: 1666-1680.	2013	Yes http://www.nature.com/cr/journal/vaop/ncurrent/full/cr2012151a.html	Yes	No
2013				Shen J, Zeng YL, Zhuang X, Sun L, Yao X, Pimpl P and *Jiang L.	Organelle pH in the Arabidopsis Endomembrane System. <i>Molecular Plant</i> 6: 1419-1437	2013	Yes http://www.cell.com/molecular-plant/fulltext/S1674-2052(14)60217-3	Yes	No
2013				Xu W, Jia L, Shi W, Baluška F, Kronzucker H, Liang J and	Tomato 14-3-3 Protein TFT4 Modulates	2013	Yes http://www.plantphysiol.org/content/e	Yes	No

				*Zhang J.	Proton Efflux, Basipetal Auxin Transport and PKS5-J3 Pathway in Root Growth Response to Alkaline Stress. <i>Plant Physiology</i> doi: 10.1104/pp.13.224758		arly/2013/10/17/pp.113.224758.1		
2013				Cao M, Mao Z, Kam C, Xiao N, Cao X, Shen C, Cheng KKY, Xu A, Lee KM, Jiang L and *Xia J	PICK1 and ICA69 Control Insulin Granule Trafficking and Their Deficiencies Lead to Impaired Glucose Tolerance. <i>PLOS Biology</i> 11(4): e1001541	2013	Yes http://www.plosbiology.org/article/info%3Adoi%2F10.1371%2Fjournal.pbio.1001541	Yes, used HKUST10/CRF/11G, which is the code given for CUHK2/CRF/11G at HKUST	No
2013				Li S, Liu L, Zhuang X, Yu Y, Liu X, Pan Z, Raikhel N, Jiang L and *Chen X.	MicroRNAs inhibit the translation of target mRNAs on the endoplasmic reticulum in <i>Arabidopsis</i> . <i>Cell</i> 153: 562-574.	2013	Yes http://www.cell.com/abstract/S0092-8674(13)00404-2	Yes	No
2013				Wang J, Shen J, Cai Y, Robinson DG and *Jiang L.	Successful transport to the vacuole of heterologously expressed mung bean 8S globulin occurs in seed but not in vegetative tissues. <i>Journal of Experimental Botany</i> 64:	2013	Yes http://jxb.oxfordjournals.org/content/64/6/1587.full	Yes	No

CRF 8G (Revised Sep 15)

					1587-1601.				
2013				Jia T, Gao C, Cui Y, Wang J, Ding Y, Cai Y, Ueda T, Nakano A and *Jiang L.	ARA7(Q69L) expression in transgenic Arabidopsis cells induces the formation of enlarged multivesicular bodies. <i>Journal of Experimental Botany</i> 64: 2817-2829.	2013	Yes http://jxb.oxfordjournals.org/content/64/10/2817.full	Yes	No
2013				Shen J, Suen PK, Wang X, Lin Y, Lo SW, Rojo E and *Jiang L.	An in vivo expression system for the identification of cargo proteins of vacuolar sorting receptors in Arabidopsis culture cells. <i>The Plant Journal</i> 75: 1003-1017.	2013	Yes http://onlinelibrary.wiley.com/doi/10.1111/tpj.12257/full	Yes	No
2013				Wang H, Zhuang XH, Cai Y, Cheung AY and *Jiang L.	Apical F-actin-regulated exocytic targeting of NtPPME1 is essential for construction and rigidity of the pollen tube cell wall. <i>The Plant Journal</i> 76(3): 367-379.	2013	Yes http://onlinelibrary.wiley.com/doi/10.1111/tpj.12300/abstract	Yes	No
2013				Zhuang, X., Wang, H., Lam, S.K., Gao, C., Wang, X., Cai, Y. & *Jiang, L.	A BAR-Domain Protein SH3P2, Which Binds to Phosphatidylinositol 3-Phosphate and ATG8,	2013	Yes http://www.plantcell.org/content/25/11/4596.full	Yes	No

					Regulates Autophagosome Formation in Arabidopsis. <i>The Plant Cell</i> 25: 4596-4615.				
2013				Ding, Y., Wang, J., Lai, J.H.C., Chan, V.H.L., Wang, X., Cai, Y., Tan, X., Bao, Y., Xia, J., Robinson, D.G., and *Jiang, L.	Exo70E2 is essential for exocyst subunit recruitment and for EXPO formation in both plants and animals. <i>Molecular Biology of the Cell</i> . 25(3): 412-426.	2013	Yes http://www.molbiolcell.org/content/25/3/412.full	Yes	No
2013				Yang Z, Guo G, Zhang M, Liu CY, Hu Q, Lam H, Cheng H, Xue Y, Li J and *Li N.	Stable Isotope Metabolic Labeling-based Quantitative Phosphoproteomic Analysis of Arabidopsis Mutants Reveals Ethylene-regulated Time-dependent Phosphoproteins and Putative Substrates of Constitutive Triple Response 1 Kinase. <i>Molecular & Cellular Proteomics</i> . 12: 3559-3582.		Yes http://www.mcponline.org/content/12/12/3559.long	No	No
2014				*Chan R, Yang HF and Zeng TY.	A Two-stage Image Segmentation	2013	Yes http://www.math.cuhk.edu.hk	Yes	No

CRF 8G (Revised Sep 15)

					n Method for Blurry Images with Poisson or Multiplicative Gamma Noise <i>SIAM Journal of Imaging Science</i>		k/~rchan/paper/tieyong-hong-fei_poisson.pdf		
2014				Chen C, Chen H, Lin YS, Shen JB, Shan JX, Qi P, Shi M, Zhu MZ, Huang XH, Feng Q, Han B, Jiang L, Gao JP and *Lin HX.	A two-locus interaction causes interspecific hybrid weakness in rice. <i>Nature Communications</i> 5: 3357.		Yes http://www.nature.com/ncomms/2014/140221/ncomms4357/full/ncomms4357.html	Yes	No
2014				Zhuang XH and *Jiang L	Autophagosome biogenesis in plants: Roles of SH3P2. <i>Autophagy</i> 10:4.		Yes https://www.landesbioscience.com/journals/autophagy/article/28060/	Yes	No
2014				Cui Y, Zhao Q, Gao C, Ding Y, Zeng YL, Ueda T, Nakano A and *Jiang L	Activation of the Rab7 GTPase by the MON1-CCZ1 complex is essential for PVC-to-vacuole trafficking and plant growth in <i>Arabidopsis</i> . <i>Plant Cell</i> 13(26): 2080-97.		Yes http://www.plantcell.org/content/early/2014/05/13/tpc.114.123141.long	Yes	No
2014				Shen J, Fu J, Ma J, Wang X, Gao C, Zhuang C, Wan J and *Jiang L	Isolation, Culture, and Transient Transformation of Plant Protoplasts. <i>Current Protocols in Cell Biology</i> 14(6):666-73.		Yes (PDF attached)	Yes	No

CRF 8G (Revised Sep 15)

2014				Gao C, Cai Y, Wang Y, Kang BH, Aniento F, Robinson DG and *Jiang L	Retention mechanisms for ER and Golgi membrane proteins. <i>Trends in Plant Science</i> 19(8): 508-515.		Yes http://www.science.direct.com/science/article/pii/S1360138514000934	Yes	No
2014				Cai Y, Zhuang X, Gao C, Wang X and *Jiang L	Arabidopsis Endosomal Sorting Complex Required for Transport III (ESCRT-III) Regulates Internal Vesicle Formation of Prevacuolar Compartment and Is Required for Plant Development. <i>Plant Physiology</i> 165(3):1328-1343.		Yes http://www.plantphysiol.org/content/early/2014/05/08/pp114.238378	Yes	No
2014				Ding Y, Robinson DG and *Jiang L	Unconventional Protein Secretion (UPS) pathways in plants. <i>Current Opinion in Cell Biology</i> 29: 107-115.		Yes http://www.science.direct.com/science/article/pii/S0955067414000611	Yes	No
2014				Gao C, Luo M, Zhao Q, Yang R, Cui Y, Zeng Y, Xia J and *Jiang L	A Unique Plant ESCRT, Component FREE1, Regulates Multivesicular Body Protein Sorting and Plant Growth. <i>Current Biology</i> 24(21): 2556-63.		Yes http://www.science.direct.com/science/article/pii/S0960982214011348	Yes	No

CRF 8G (Revised Sep 15)

2014				Luo F, Fong YH, Zeng Y, Shen J, Jiang L and *Wong KB	How Vacuolar Sorting Receptor Proteins Interact with Their Cargo Proteins: Crystal Structures of Apo and Cargo-Bound Forms of the Protease-Associated Domain from an Arabidopsis Vacuolar Sorting Receptor. <i>Plant Cell</i> 26(9): 3693-708.		Yes http://www.plantcell.org/content/26/9/3693.long	Yes	No
2014				Shen J, Ding Y, Gao C, Rojo E and *Jiang L	N-linked glycosylation of AtVSR1 is important for vacuolar protein sorting in Arabidopsis. <i>The Plant Journal</i> 80: 977-992.		Yes http://onlinelibrary.wiley.com/doi/10.1111/tpj.12696/full	Yes	No
2014				Li S, He Q, Wang H, Tang X, Ho KW, Gao X, Zhang Qian, Shen Y, Cheung A, Wong F, Wong YH, Ip N Y, Jiang L, Yung WH and *Liu K	Injured adult retinal axons with Pten and Socs3 co-deletion reform active synapses with suprachiasmatic neurons. <i>Neurobiology of Disease</i> 73:366-376.		Yes http://www.sciencedirect.com/science/article/pii/S096996114002927	Yes	Yes
2014				Gao C, Cai Y, Zhuang X and *Jiang L	Analysis of Prevacuolar Compartment-Mediated Vacuolar Proteins Transport. <i>Methods in Molecular</i>		Yes (PDF attached)	Yes	No

CRF 8G (Revised Sep 15)

					<i>Biology</i> 1209:119-129.				
2014				Wang X, Cai Y, Wang H, Zeng Y, Zhuang X, Li B and *Jiang L	<i>Trans-Golgi network-localized AP1 gamma adaptins mediate dileucine motif-directed vacuolar targeting in Arabidopsis. Plant Cell</i> 26(10): 4102-18.		Yes http://www.plantcell.org/content/26/10/4102.long	Yes	No
2015				Gao C, Zhuang X, Cui Y, Fu X, He Y, Zhao Q, Zeng Y, Shen J, Luo M and *Jiang L	Dual roles of an Arabidopsis ESCRT component FREE1 in regulating vacuolar protein transport and autophagic degradation. <i>Proceedings of the National Academy of Sciences of the United States of America</i> 112(6): 1886-91.		Yes http://www.pnas.org/content/112/6/1886.long	Yes	No
2015				Zhao Q, Gao C, Lee P, Liu L, Li S, Hu T, Shen J, Pan S, Ye H, Chen Y, Cao W, Cui Y, Zeng P, Yu S, Gao Y, Cheng L, Mo B, Liu X, Xiao S, Zhao Y, Zhong S, Chen X and *Jiang L	Fast-suppressor screening for new components in protein trafficking, organelle biogenesis and silencing pathway in Arabidopsis thaliana using DEX-inducible FREE1-RN		Yes http://www.science.direct.com/science/article/pii/S1673852715000752	Yes	No

CRF 8G (Revised Sep 15)

					Ai plants. <i>The Journal of Genetics and Genomics</i> 42(6):319-330.				
2015				Wan S & *Jiang L	Endoplasmic reticulum (ER) stress and the unfolded protein response (UPR) in plants. <i>Protoplasma</i> 253(3):753-64.		Yes http://link.springer.com/article/10.1007%2Fs00709-015-0842-1	Yes	No
2015				Zhuang X, Cui Y, Gao C and *Jiang L	Endocytic and autophagic pathways crosstalk in plants. <i>Current Opinion in Plant Biology</i> 28:39-47.		Yes http://www.science-direct.com/science/article/pii/S1369526615001417	Yes	No
2015				#Lin Y, #Ding Y, Wang J, Shen J, Kung CH, Zhuang X, Yin Z, Xia Y, Lin H, Robinson DG, *Jiang L	Exocyst-Positive Organelles and Autophagosomes Are Distinct Organelles in Plants. <i>Plant Physiology</i> 169(3):1917-32.		Yes http://www.plantphysiol.org/content/169/3/1917.long	Yes	No
2015				Woo CH, Gao C, Yu P, Tu L, Meng Z, Banfield DK, Yao X, *Jiang L	Conserved Function of the Lysine-based KXD/E Motif in Golgi Retention for Endomembrane Proteins among Different Organisms. <i>Molecular Biology of the Cell</i>		Yes http://www.molbiolcell.org/content/26/23/4280.long	Yes	No

CRF 8G (Revised Sep 15)

					26(23):4280-93.				
2015				Zeng Y, Chung KP, Li B, Lai CM, Lam SK, Wang X, Cui Y, Gao C, Luo M, Wong KB, Schekman R, and *Jiang L	Unique COPII component AtSar1a/AtSec23a pair is required for the distinct function of protein ER export in <i>Arabidopsis thaliana</i> . <i>Proceedings of the National Academy of Sciences of the United States of America</i> 12(46):14360-5.		Yes http://www.pnas.org/content/112/46/14360.long	Yes	No
2015				*Robinson DG, Ding Y and Jiang L	Unconventional protein secretion in plants: a critical assessment. <i>Protoplasma</i> 253(1):31-43.		Yes http://link.springer.com/article/10.1007%2Fs00709-015-0887-1	Yes	No
2016	2016			Shen J, Gao C, Zhao Q, Lin Y, Wang X, Zhuang X and *Jiang L	AtBRO1 functions in ESCRT-I complex to regulate multivesicular body protein sorting. <i>Molecular Plant</i> (in press) doi: 10.1016/j.molp.2016.02.005.		Yes http://www.sciencedirect.com/science/article/pii/S167405216000381	Yes	No
2016	2016			Cui Y, Shen J, Gao C, Zhuang X, Wang J and *Jiang L	Biogenesis of Plant Prevacuolar Multivesicular Bodies. <i>Molecular Plant</i> (in press) doi:		Yes http://www.cell.com/molecular-plant/abstract/S1674-2052(16)000	Yes	No

					10.1016/j.molp.2016.01.011.		30-7		
--	--	--	--	--	-----------------------------	--	----------------------	--	--

9. Recognized international conference(s) in which paper(s) related to this research project was/were delivered (Please attach a copy of each conference abstract)

Month/Year/ Place	Title	Conference Name	Submitted to RGC (indicate the year ending of the relevant progress report)	Attached to this report (Yes or No)	Acknowledged the support of RGC (Yes or No)	Accessible from the institutional repository (Yes or No)
1. 08/2012/ Hong Kong	SURE-Based Motion Blur Estimation	IEEE International Conference on Signal Processing, Communications and Computing (ICSPCC'12)	2013	Yes	No	No
2. 08/2012/ USA	SURE-based blind Gaussian deconvolution	IEEE Statistical Signal Processing Workshop (SSP)	2013	Yes	No	No
3. 09/2012/ USA	SURE-LET image deconvolution using multiple Wiener filters	IEEE International Conference on Image Processing (ICIP'12)	2013	Yes	No	No
4. 10/2012/ Korea	Molecular Characterization of EXPO-Mediated Plant Exocytosis	10th International Congress on Plant Molecular Biology	2013	Yes	Yes	No
5. 10/2012/ Korea	The Golgi-Localized Arabidopsis Endomembrane Protein 12 (EMP12) Contains both ER Export and Golgi Retention Signals at its C-terminus	10th International Congress on Plant Molecular Biology	2013	Yes	Yes	No
6. 10/2012/ Korea	Identification and characterization of Arabidopsis VSR cargo proteins	10th International Congress on Plant Molecular Biology	2013	Yes	Yes	No
7. 10/2012/ China	Molecular Mechanism of Exocytosis-Mediated Cell Wall Construction in Growing Pollen Tubes	The 2012 Pollen Biology International Symposium	2013	Yes	Yes	No
8. 10/2012/ China	The Roles of Phosphoinositide Kinases in Vesicular Trafficking of Growing Pollen Tubes	The 2012 Pollen Biology International Symposium	2013	Yes	Yes	No

CRF 8G (Revised Sep 15)

9. 06/2013/ China	Golgi Retention Mechanisms of Endomembrane Membrane Proteins (EMPs) in Eukaryotes	Plant Cell and Developmental Biology, Cold Spring Harbor Asia	2013	Yes	Yes	No
10.06/2013/ China	Functional Study of Endomembrane Proteins (EMPs) in Plants	Plant Cell and Developmental Biology, Cold Spring Harbor Asia	2013	Yes	Yes	No
11.06/2013/ China	Biogenesis and function of COPII vesicles in plants	Plant Cell and Developmental Biology, Cold Spring Harbor Asia	2013	Yes	Yes	No
12.06/2013/ Australia	Molecular Mechanisms of PVC-Vacuole Trafficking in Plant Cells	24th International Conference on Arabidopsis Research (ICAR)	2013	Yes	Yes	No
13.06/2013/ Australia	EXPO Function in Plants	24th International Conference on Arabidopsis Research (ICAR)	2013	Yes	Yes	No
14.06/2013/ Australia	Biogenesis of EXPO in Plant Cells	24th International Conference on Arabidopsis Research (ICAR)	2013	Yes	Yes	No
15.06/2013/ Australia	Autophagy and Autophagosome in Plants	24th International Conference on Arabidopsis Research (ICAR)	2013	Yes	Yes	No
16.06/2013/ France	A Two-stage Image Segmentation Method using a Convex Variant of the Mumford-Shah Model and Thresholding	CIMI Workshop on Optimization and Statistics in Image Processing	2013	Yes	No	No
17.07/2013/ Hong Kong	Roles of EXPO cargo protein in Arabidopsis growth and development	GRC Posttranslational Modification Networks	2013	Yes	No	No
18.09/2013/ China	A Two-stage Image Segmentation Method using a Convex Variant of the Mumford-Shah Model and Thresholding	Shanghai International Workshop on Inverse Problems and Imaging Sciences	2013	Yes	No	No

CRF 8G (Revised Sep 15)

19.04/2014/ Korea	Golgi Retention Mechanisms of Endomembrane Membrane Proteins (EMPs) in Eukaryotes	East Asian Cell Biology Workshop 2014 Conference		Yes	Yes	No
20.04/2014/ Korea	Suppressors screening for identification of new components involved in protein trafficking and organelle biogenesis in Arabidopsis	East Asian Cell Biology Workshop 2014 Conference		Yes	Yes	No
21.05/2014/ USA	A BAR-Domain Protein SH3P2, Which Binds to Phosphatidylinositol 3-Phosphate and ATG8, Regulates Autophagosome Formation in Arabidopsis	Keystone Symposia on Molecular and Cellular Biology - Autophagy: Fundamentals to Disease		Yes	Yes	No
22.05/2014/ USA	In Vitro Reconstitution of Plant Autophagosome Formation	Keystone Symposia on Molecular and Cellular Biology - Autophagy: Fundamentals to Disease		Yes	Yes	No
23.07/2014/ China	EXPO (exocyst-positive organelle): isolation, proteomic analysis and function in plants	3rd International Conference on Plant Metabolism		Yes	Yes	No
24.07/2014/ Canada	A novel PVC-localized protein FREE1 is essential for vacuolar protein transport and vacuole biogenesis in Arabidopsis	25th International Conference on Arabidopsis Research (ICAR)		Yes	Yes	No
25.07/2014/ Canada	Roles of AtExo70E2 in exocyst recruitment, EXPO biogenesis and function, and plant growth and development	25th International Conference on Arabidopsis Research (ICAR)		Yes	Yes	No
26.07/2014/ Canada	Rab7 activation by the MON1-CCZ1 complex is essential for PVC-to-vacuole trafficking and plant growth in Arabidopsis	25th International Conference on Arabidopsis Research (ICAR)		Yes	Yes	No
27.04/2015/ China	Functional Roles of MON1-CCZ1 Complex in Vacuolar Trafficking	CSCB The Biennial Conference and the 15th Congress of the Chinese Society for Cell Biology		Yes	Yes	No
28.04/2015/ China	MISS: Mutant Identification of SH3P2 Suppressor	CSCB The Biennial Conference and the 15th Congress of the Chinese Society for Cell Biology		Yes	Yes	No

CRF 8G (Revised Sep 15)

29.04/2015/ China	Fast-suppressor screening for new components involved in protein trafficking, organelle biogenesis and RNAi pathway in <i>Arabidopsis thaliana</i> using dominant DEXinducible FREE1-RNAi transgenic plants	CSCB The Biennial Conference and the 15th Congress of the Chinese Society for Cell Biology		Yes	Yes	No
30.04/2015/ China	Tandem Affinity Purification of the Unit Exocyst Complex of Recently Discovered Plant organelle EXPO	CSCB The Biennial Conference and the 15th Congress of the Chinese Society for Cell Biology		Yes	Yes	No
31.04/2015/ China	EXPO and Autophagosome in <i>Arabidopsis thaliana</i>	CSCB The Biennial Conference and the 15th Congress of the Chinese Society for Cell Biology		Yes	Yes	No

10. Student(s) trained (please attach a copy of the title page of the thesis)

Name	Degree registered for	Date of registration	Date of thesis submission/ graduation
Ding, Yu	Ph.D.	2007-08-01	2013-08-31
Zhuang, Xiaohong	Ph.D.	2008-08-01	2013-08-31
Shen, Jinbo	Ph.D.	2009-08-01	2013-08-31
Lau, On-chai Eva	Ph.D.	2009-08-01	2013-07-31
Feng, Xue	Ph.D.	2009-08-01	2013-06-14
WANG Xiangfeng	Ph.D.	2009-08-01	2015-06-10
LUO Fang	Ph.D.	2010-08-01	2014-09-30
CUI Yong	Ph.D.	2011-08-01	2014-09-30
Jia, Tianran	M.Phil.	2010-08-01	2012-08-31
Lam, Chun Kok	M.Phil.	2010-08-01	2012-12-31
Wang, Tianming	M.Phil.	2011-08-01	2013-07-31
Liu, Yingqi	M.Phil.	2012-02-01	2013-06-31
LAI Ching Man	M.Phil	2012-08-01	2015-03-26
WOO Cheuk Hang	M.Phil	2012-08-01	2015-06-10
LIN Youshun	M.Phil	2013-01-01	2014-12-31

11. Other impact (e.g. award of patents or prizes, collaboration with other research institutions, technology transfer, etc.)

Project Coordinator

Contact Information:

ljiang@cuhk.edu.hk