

Sung Hyun (Joseph) Cho

Research Associate
Department of Biochemistry and Molecular Biology
Pennsylvania State University
319 North Frear
University Park, PA 16802
USA

josephcho91@gmail.com
office: (814) 865-3679
cell phone: (314) 275-2089

EDUCATION

Doctor of Philosophy (Ph. D)	1999-2004
School of Life Sciences and Biotechnology, Korea University, Seoul, Korea Major: Plant Molecular Biology Dissertation: <u>Stage specific genes and proteins, and recombinant protein expression in <i>Physcomitrella patens</i></u>	
Master of Science (MS)	1997-1999
Graduate School of Biotechnology, Korea University, Seoul, Korea Major: Molecular Biology Thesis: <u>Particle bombardment mediated transformation and GFP expression in the moss <i>Physcomitrella patens</i></u>	
Bachelor of Science	1991-1997
Department of Agronomy (Crop Science), Korea University, Seoul, Korea	

EMPLOYMENT

Pennsylvania State University	2013- present
Research Associate	Adviser: Dr. Tracy Nixon
Pennsylvania State University	2010- 2013
Research Associate	Adviser: Dr. Michael J. Axtell
Pennsylvania State University	2007-2010
Postdoctoral Scholar	Adviser: Dr. Michael J. Axtell
Washington University	2004-2007
Postdoctoral Scholar	Adviser: Dr. Ralph S. Quatrano

FELLOWSHIPS and AWARDS

1. International Plant Molecular Biology Conference (Travel Award)	2010
2. Korea Science and Engineering Foundation (Postdoctoral Fellowship)	2004-2005
3. Korea Research Foundation (Brain Korea 21 Graduate student Fellowship)	2001-2004
4. Korea Research Foundation (Brain Korea 21 Scholarship)	1999-2001

- | | |
|---|-----------|
| 5. DAAD, German Government (Korea-Germany Graduate Students Exchange Program) | 2000 |
| 6. National Graduate School Project Fund from Korea University (Scholarship) | 1997-1999 |
| 7. Korea University (Award for an excellent grade) | 1995 |

PUBLICATIONS

1. Coruh C*, **Cho SH***, Shahid S, Liu Q, Wierzbicki A, Axtell MJ (2015) Comprehensive annotation of *Physcomitrella patens* small RNA loci reveals 23nt heterochromatic siRNAs dependent on a minimal Dicer-Like gene. *Plant Cell* 27(12):2148-2162
*Co-first author
2. **Cho SH**, Du J, Sines I, Poosarla VG, Vepachedu V, Kafle K, Park YB, Kim SH, Roberts A, Kumar M, Nixon BT (2015) *In vitro* synthesis of cellulose microfibrils by membrane protein from protoplasts of the non-vascular plant *Physcomitrella patens*. *Biochemical Journal* 470, 195-205
3. **Cho SH**, Coruh C, Axtell MJ (2012) miRNA156 and miR390 regulate tasiRNA accumulation and developmental timing in *Physcomitrella patens*. *Plant Cell* 24(12):4837-4849
4. Arif MA, Fattash I, Ma Z, **Cho SH**, Beike A, Reski R, Axtell M, Frank W (2012) Compensatory DICER-LIKE3 activity in *Physcomitrella patens* DICER-LIKE4 mutants causes severe developmental dysfunction and sterility. *Molecular Plant* 5(6):1281-1294
5. Khandelwal A, **Cho SH**, Marella H, Sakata Y, Perroud P-F, Pan A, Quatrano RS (2010) Role of ABA and ABI3 in desiccation tolerance. *Science* 327(5965):546
6. Hoang QT*, **Cho SH***, McDaniel SF, Ok SH, Quatrano RS, Phan VC, Shin JS (2009) A novel plant cytolysin with an unusual phylogenetic distribution plays an important role in dehydration stress in *Physcomitrella patens*. *New Phytologist* 184(2):502-510
* Co-first author
7. **Cho SH**, Schwartzenberg KV, Quatrano RS (2009) The role of abscisic acid in stress tolerance. IN: The Moss *Physcomitrella*. (Eds. Knight CD, Cove DJ, and Perroud PF) Wiley Blackwell (Oxford).
8. Lee BK, Huh MK, Choi JS, **Cho SH** (2009) Phylogeny study of genus *Pelvetia* by internal transcribed spacer sequence (ITS). *J. Life Sci.* 19(3):311-316
9. **Cho SH**, Addo-Quaye C, Coruh C, Arif MA, Ma Z, Frank W, Axtell MJ (2008) *Physcomitrella patens* DCL3 is required for 22-24 nt siRNA accumulation, suppression of retrotransposon-derived transcripts, and normal development. *PLoS Genetics* 4(12):e1000314
10. Rensing SA, Lang D, Zimmer AD, Terry A, Salamov A, Shapiro H, Nishiyama T, Perroud PF, Lindquist EA, Kamisugi Y, Tanahashi T, Sakakibara K, Fujita T, Oishi K, Shin-I T, Kuroki Y, Toyoda A, Suzuki Y, Hashimoto S, Yamaguchi K, Sugano S, Kohara Y, Fujiyama A, Anterola A, Aoki S, Ashton N, Barbazuk WB, Barker E, Bennetzen JL, Blankenship R, **Cho SH**, Dutcher SK, Estelle M, Fawcett JA, Gundlach H, Hanada K, Heyl A, Hicks KA, Hughes J, Lohr M, Mayer K, Melkozernov A, Murata T, Nelson DR, Pils B, Prigge M, Reiss B, Renner T, Rombauts S, Rushton PJ, Sanderfoot A, Schween G, Shiu SH, Stueber K, Theodoulou FL, Tu H, Van de Peer Y, Verrier PJ, Waters E, Wood A, Yang L, Cove D, Cumings AC, Hasebe M, Lucas S, Mishler BD, Reski R, Grigoriev IV, Quatrano

RS, Boore JL. (2008) The *Physcomitrella* genome reveals evolutionary insights into the conquest of land by plants. *Science* 319(5859):64-69

11. Cuming A, **Cho SH**, Kamisugi Y, Graham H, Quatrano RS (2007) Coordinated expression of stress responsive genes in the moss, *Physcomitrella patens*. *New Phytologist* 176(2):275-287

12. **Cho SH**, Quatrano RS, Shin JS (2007) Transgenesis of *Physcomitrella patens*. *Transgenic Plant Journal* 1(1):99-103

13. **Cho SH***, Hoang QT*, Phee JW, Kim YY, Shin HY, Shin JS (2007) The modified suppression subtractive hybridization identified an AP2-containing protein which is involved in metal response in *Physcomitrella patens*. *Mol. Cells*. 23(1): 100-107

* Co-first author

14. **Cho SH***, Hoang QT*, Kim YY, Shin HY, Ok SH, Bae JM, Shin JS (2006) Proteome analysis of gametophore identified a metallothionein involved in various abiotic stress responses in *Physcomitrella patens*. *Plant Cell Reports* 25(5):475-88

* Co-first author

15. Oh KH, Cheon BY, **Cho SH**, Truong HQ, Ok SH, Jeung JU, Choi JW, Shin JS (2003) Expression of the bovine growth hormone alters the root morphology in transgenic tobacco plants. *Transgenic Research* 12: 363-367

16. Chai ML, Senthil K, Mo SY, Chung YS, **Cho SH**, Shin JS, Park MH, Kim DH (2000) Embryogenic callus and *Agrobacterium*-mediated transformation in bentgrass (*Agrostis* spp.) *J. Kor. Soc. Hort. Sci.* 41(5): 450-454

17. **Cho SH**, Chung YS, Cho SK, Rim YW, Shin JS (1999) Particle bombardment mediated transformation and GFP expression in the moss *Physcomitrella patens*. *Mol. Cells*. 9(1): 14-19

INVITED SEMINARS

1. Monsanto Company, St. Louis, USA (September, 2011) miR156 promotes gametophore transition through regulation of *PpSBP3* in the moss *Physcomitrella patens*

2. Yonsei University, Seoul, Korea (July, 2010) small RNAs in the moss *Physcomitrella patens*.

3. Korea University, Seoul, Korea (July, 2010) small RNAs in the moss *Physcomitrella patens*.

4. Postech, Pohang, Korea (July, 2010) small RNAs in the moss *Physcomitrella patens*.

5. Seoul National University, Seoul, Korea (August, 2010) small RNAs in the moss *Physcomitrella patens*.

SYMPOSIUM ORAL-PRESENTATIONS

1. **Cho SH**, Axtell MJ (2012) A partially conserved miR156-tasiRNA network controls phase change in the moss *Physcomitrella patens*. Moss 2012 meeting, The New York Botanical Garden, USA.

2. **Cho SH**, Axtell MJ (2011) microRNA156 promotes gametophore transition through regulation of *PpSBP3* in the moss *Physcomitrella patens*. 18th Biennial Penn State Plant Biology Symposium, Penn State University, USA

3. **Cho SH**, Axtell MJ (2010) microRNA156 functions for caulonemal growth and gametophore transition in *Physcomitrella patens*. Moss 2010, Hokkaido University, Japan
4. **Cho SH**, Addo-Quaye C, Coruh C, Ma Z, Axtell MJ (2009) DCL3 and RDR1 are necessary for repeat-associated siRNA production in the moss *Physcomitrella patens*. Moss 2009, Washington University in St Louis, Missouri, USA
5. **Cho SH** and Ralph Quatrano (2006) Polar tip growth of protonema and the potential role of vesicle-associated membrane proteins in *Physcomitrella*. Moss 2006, UC Berkeley, California, USA
6. **Cho SH** and Ralph Quatrano (2005) A strategy identifying genes expressed during polar tip growth of *Physcomitrella*. Moss 2005, Mendel Center, Brno, Czech Republic

SYMPOSIUM PROCEEDINGS

1. Coruh C, **Cho SH**, Shahid S, Liu Q, Wierzbicki A, Axtell MJ (2014) Comprehensive annotation of *Physcomitrella patens* small RNA loci reveals 23nt heterochromatic siRNAs dependent on a minimal Dicer-Like gene. American Society of Plant Biologists Conference, Portland, OR, USA, July 12- 16
2. Coruh C, **Cho SH**, Shahid S, Axtell MJ (2013) A novel type of Dicer-Like gene affects heterochromatic siRNA accumulation in *Physcomitrella patens*. American Society of Plant Biologists Conference, Providence, RI, USA, July 21- 26
3. Coruh C, **Cho SH**, Gregory BD, Axtell MJ (2012) The effect of PpRDR1 on small RNA and whole transcriptomes profiles in *Physcomitrella patens*. The Biology of Plants, The LXXVII Cold Spring Harbor Symposium on Quantitative Biology, Cold Spring harbor Laboratory, USA
4. **Cho SH**, Axtell MJ (2011) microRNA156 promotes gametophore transition through regulation of *PpSBP3* in the moss *Physcomitrella patens*. Plant Biology 2011, American Society of Plant Biologists, Minneapolis, Minnesota, USA, August 6-10
5. **Cho SH**, Addo_Quaye C, Coruh C, Ma Z, Axtell MJ (2009) DCL3 and RDR1 are necessary for repeat-associated siRNA production in the moss *Physcomitrella patens*. The 9th International Plant Molecular Biology Congress, St Louis, Missouri, USA, October 25-30
6. **Cho SH**, JoAnn Snyder, Manqing Ding, Axtell JM (2009) Regulation of leaf morphology by a conserved miRNA in *Arabidopsis thaliana* and *Physcomitrella patens*. The 25th Symposium in Plant Biology, UC Riverside, California, USA, January 29-31
7. **Cho SH**, Addo-Quaye C, Coruh C, Ma Z, Axtell JM (2008) Multi –genome analysis of small RNA-producing loci. Plant Biology 2008 (American Society of Plant Biologists), Merida, Mexico, June 26- July 1
8. Hoang QT, **Cho SH**, Kim YY, Shin HY, Ok SH, Bae JM, Shin JS (2006) Proteomics: a tool to identify a novel protein from the moss *Physcomitrella patens*. Moss2006, UC Berkeley, California, USA, June 26-30
9. Hoang QT, **Cho SH**, Ok SH, Cho SK, Bahn SC, Shin JS (2006) Characterization of novel cytolysin, physcomittrin, from the moss *Physcomitrella patens*. Moss 2006, UC Berkeley, California, USA, June 26-30
10. Hoang QT, **Cho SH**, Kim YY, Shin JS (2003) Proteome analysis and production of recombinant proteins in *Physcomitrella patens*, China, October 4-7

11. Hoang QT, **Cho SH**, Kim YY, Shin JS (2003) Proteome analysis of protonema and gametophore tissues of *Physcomitrella*. MOSS 2003, St. Louis, Missouri, USA, September 7-10
12. Oh KH, Bae JM, **Cho SH**, Choi JW, Cheon BY, Shin JS (2001) Production of bovine growth hormone in transgenic plants. The 13th Annual Meeting of the Korean Society for Molecular and Cellular Biology, p252, Seoul.
13. Cheon BY, Bae JM, **Cho SH**, Choi JW, Oh KH, Shin JS (2001) Expression of human erythropoietin in transgenic plants. The 13th Annual Meeting of the Korean Society for Molecular and Cellular Biology, p251, Seoul.
14. **Cho SH**, Shin JS* (2001) Construction of a gametophore-selective subtraction library in *Physcomitrella patens*. Moss2001 - An International Meeting on Moss Biology, Okazaki, Japan (May 27-29)
15. **Cho SH** and Shin JS* (2000) Stable chloroplast transformation of the moss *Physcomitrella patens* using GFP as reporter. Moss 2000: A meeting dedicated to moss biology, Villars, Switzerland
16. **Cho SH**, Yoo MK, Bae JM, Jeung JU, Chung YS, Lee SB, Shin JS (2000) Stable transformation of the moss *Physcomitrella patens*. The Korean Society of Molecular Biology, p275, Seoul.
17. **Cho SH**, You MK, Bae JM, Chung YS, Shin JS (2000) Highly efficient chloroplast transformation of the moss *Physcomitrella patens*. Plant Science Meeting, Korea.
18. **Cho SH**, Chung YS, Cho SK, Shin JS (1998) Development of transformation system in the moss *Physcomitrella patens* as a plant model system for the study of gene expression. Korean Society of Molecular Biology, Seoul, Korea.

OTHER RESEARCH TRAINING

1. CRYO-EM Class

Department of Infectious Disease, Penn State College of Medicine
July 2013 - September 2013 (3 months)

2. Korea-Germany graduate students exchange program

Department of Plant Biology, Freiburg University, Freiburg, Germany
Supported by DAAD (Germany), Advisor: Dr. Prof. Ralf Reski
July 2000 - August 2000 (2 months)