**Hsuan Chen Ph.D.**

Assistant Professor, Horticultural Science

North Carolina State University

**Education**

**Ph.D. in Horticulture**,Oregon State University (OSU), Corvallis, Oregon Dec 2018

* Option: Plant Breeding and Genetics
* Statistics Minor
* Advisor: Dr. Ryan N. Contreras
* *Dissertation topic* – Developing Tools for Breeding Hardy *Hibiscus* and Lilac: Quantile Regression, Cytogenetics, Interspecific Hybridization, Somatic Hybridization, and Marker-Trait Association

**M.S. in Agronomy**, National Taiwan University (NTU)**,** Taipei, Taiwan Jan 2010

* Option: Plant Breeding and Genetics
* Advisor: Dr. Yue-Ie Hsing and Dr. Mei-Chu Chung
* *Thesis title* − Preliminary Studies on the Genome and Chromosome Markers of Wild Soybeans Collected in Taiwan

**B.S. in Life Sciences,** National University of Kaohsiung (NUK), Kaohsiung, Taiwan Jul 2007

* *Thesis title* − Effects of Light Spectrums on the Endoreduplication Level of Tissue Cultured *Phalaenopsis Amabilis* Seedling

**Research Experience**

**Assistant Professor: Horticultural Science, NCSU**  Jan 2021 – Present

* Ornamental Plant Breeding
* Cytogenetics in plant breeding
* Hemp Breeding

**Research Scientist / Plant Breeder: Oregon CBD, Monmouth, Oregon**  Feb 2019 – Dec 2020

* Industrial hemp breeding, crossing combination design and self-line selection
* Ploidy manipulation to increase functional chemical concentrations and to reduce fertility
* Optimization of tissue culture environment and medium for different plant materials
* Molecular marker development: SSR marker and SNP marker development, genotyping-by-sequencing (GBS), and marker-trait association

**Graduate Research Assistant: Dr. Ryan N. Contreras advisor, Department of Horticulture,**

**OSU, Corvallis, Oregon** Jul 2015 – Dec 2018

* SNP marker-trait association for *Lilacs* remontancy (reblooming) trait
* Genome size, ploidy, pollen viability, and fertility studies in interspecific *Hibiscus* hybrids
* Molecular marker development for parentage of hybrid *Hibiscus*
* Simultaneous selection threshold development for correlative traits by quantile regression
* Ribosomal DNA loci labeling of *Hibiscus syriacus*
* Karyotyping of *Hibiscus*, mint, and potato species

**Visiting Scholar: Dr. Zhiwu Zhang advisor, Department of Crop and Soil Sciences,**

**Washington State University, Pullman, Washington** Aug 2014 – Jun 2015

* GWAS analysis in wheat quality QTLs and spinach yield QTLs
* Genetic relationship between wheat cultivars
* GAPIT software improvement
* R programing in statistics

**Research Assistant: Dr. Mei-Chu Chung advisor, Institute of Plant and Microbial Biology, Academia Sinica, Taipei, Taiwan** Aug 2013 – Aug 2014

* Chromosome labeling in interspecific hybrid *Lycoris*
* Chromosomal marker discovery and cloning for *Lycoris*
* Molecular marker (SSR and ISSR) for *Lycoris*

**Graduate Research Assistant, MS: Dr. Yue-Ie Hsing and Dr. Mei-Chu Chung co-advisors, Institute of Plant and Microbial Biology, Academia Sinica, Taipei, Taiwan** Sep 2007 – Jan 2010

**Research Assistant:** Jan 2010– Aug 2010

* Repeat sequence discovery via molecular biology and bioinformatics methods
* Comparing repeat sequence distributions between *in silico* and *in situ* hybridization
* Chromosomal labeling by Fluorescence *in situ* hybridization (FISH)
* Repeat sequence distribution among soybean wild relatives
* *Glycine* species rDNA loci evolution

**Research Intern: Dr. Wen-Huei Chen advisor, NUK,** Kaohsiung, Taiwan, Department of Life Science Sep 2005 – Jul 2007

* *Phalaenopsis* spp. genome size survey
* Effects of light spectrums on the endoreduplication level of tissue cultured *Phalaenopsis amabilis* seedling
* Commercial tissue culture medium tests
* Ploidy stability of *Phalaenopsis* tissue culture systems
* *Phalaenopsis* interspecies hybridization
* Plant material maintenance and propagation

# Work / Industrial Experience

**Research Scientist / Plant Breeder: Oregon CBD, Monmouth, Oregon** Feb 2019 – Present

* Research team management
* Tissue culture laboratory development, management, and employee training
* Cytology and Molecular marker lab development, and employee training

**Project Manager: National Science and Technology Program-Energy, Taipei, Taiwan,** Jun 2012 – Mar 2013

* Reviewing and supervising national research funding
* Coordinating between cooperate groups and laboratories
* Hosting research funding committee meetings

**Agriculture Assistant Specialist: Taiwan Technical Mission in Nicaragua, Managua, Nicaragua.**

 Aug 2010 – Nov 2011

* Rice and common bean farm management and consulting
* Nutrition efficiency rice breeding
* Government released varieties purification and breeder seeds maintenance

## Refereed Journal Articles

* Chen, H. and D.J. Werner, 2021. Inheritance of Compact Growth Habit, and Investigation of Linkage to Weeping Architecture and Purple Leaf Color in Eastern Redbud (Cercis canadensis L.). HortScience 1(aop), pp.1-3.
* Crawford, S., B. M. Rojas, E. Crawford, M. Otten, T. A. Schoenenberger, A. R. Garfinkel, and **H**. **Chen,** 2021. Characteristics of the diploid, triploid, and tetraploid versions of a cannabigerol-dominant F1 hybrid industrial hemp cultivar, *Cannabis sativa* ‘Stem Cell CBG’. Genes 12(6):923.
* Neill, K.E., R.N. Contreras, V.O. Stockwell, and **H. Chen**, 2021. Screening Cotoneaster sp. for resistance to fire blight using foliar inoculation with two strains of *Erwinia amylovora*. HortScience 1(aop):1-7.
* **Chen, H.**, J.D. Lattier, K. Vining, and R.N. Contreras. 2020.  Two SNP markers identified using GBS are associated with remontancy in a segregating F1 population of *Syringa meyeri* ‘Palibin’ x *S. pubescens* ‘Penda’ Bloomerang®. J. Amer. Soc. Hort. Sci*.*
* **Chen, H.**, L. Xue, T. Li, and R.N. Contreras. 2019. Quantile regression facilitates simultaneous selection of negatively correlated floral traits among interspecific *Hibiscus syriacus* x *H. paramutabilis* hybrids. J. Amer. Soc. Hort. Sci*.* 144(1):70–76.
* Vining, K.J., I. Pandelova, K. Hummer, N. Bassil, R.N. Contreras, K. Neill, **H. Chen**, A.N. Parrish, and B. M. Lange. 2019.Genetic diversity survey of *Mentha aquatica* L. and *Mentha suaveolens* Ehrh., mint crop ancestors.Genetic Resources and Crop Evolution 66(4):825-845.
* Graebner, R.C., **H.** **Chen**,R.N. Contreras, K. Haynes, and V. Sathuvalli. 2019. Identification of a high frequency of triploid potatoes from tetraploid x diploid crosses. HortScience 54(7):1159-1163.
* Lattier, J.D., **H.** **Chen**, and R.N. Contreras. 2018. Variation in genome size, ploidy, stomata, and rDNA signals in Althea (*Hibiscus syriacus* L.). J. Amer. Soc. Hort. Sci*.* 144(2):130-140.
* Lattier, J.D., **H. Chen**, and R.N. Contreras. 2017. Improved method of enzyme digestion for root tip cytology. HortScience 52(7):1029-1032.
* **Chen, H**., M.C. Chung, Y.C. Tsai, F.J. Wei, J.S. Hsieh, and Y.I.C. Hsing. 2015. Distribution of new satellites and simple sequence repeats in annual and perennial. *Glycine* species. Botanical Studies 56(1):22.

## Conference Publication

* **Chen, H**. Genetic Diversity Survey of Two Mint Crop Ancestral Species: *Mentha aquatica* L. and Mentha suaveolens Ehrh.
* **Chen, H**.The modern breeder’s toolbox: application of FISH/GISH and marker-trait association to facilitate ornamental plant breeding. The Nation Arboretum. 2018. Invited guest lecture.
* **Chen, H.**, J.D., Lattier, and R.N. Contreras. Confirmation of *Hibiscus syriacus* allotetraploid genome and disomic segregation patterns using rDNA fluorescent in situ hybridization (FISH). ASHS Annual Meetings. 2018. Poster presentation.
* **Chen, H.** and R.N. Contreras. Quantile regression facilitates selection for negatively correlated traits. ASHS Annual Meetings. 2018. Scholars ignite competition.
* **Chen, H.** and R.N. Contreras. Using interspecific hybrid cultivars as pollen parents in *Hibiscus syriacus* breeding. Independent Plant Breeders Conference. 2016. Poster presentation.

## Teaching Experience

**Oregon State University, Corvallis, Oregon, Department of Horticulture**

* **Plant Propagation**  Winter 2018

Professor of record:Dr. Ryan N. Contreras

Assisting in setting up labs, assisting students with assignments, and designing, grading exams and giving topic lectures

*Topic lecturers*: Micropropagation introduction, application, and lab

* **Landscape Plant Materials I. Deciduous Hardwoods and Conifers** Fall 2018

Professor of record:Dr. Ryan N. Contreras

Responsibilities included preparing plant material samples, offering extra information for students, answering questions from students, assisting with the development of exams and other assignments, and grading exams and assignments

* **The Biology of Horticulture** Fall 2016

Professor of record:Dr. Ryan N. Contreras

Responsibilities included assisting students with assignments, offering extra information for students, answering questions for students, grading exams and assignments, and giving topic lectures

*Topic lecturer*: Mechanism and physiology of flowering

* **Landscape Plant Materials II. Spring Flowering Trees and Shrubs** Spring 2016

Professor of record:Dr. Ryan N. Contreras

Responsibilities included preparing plant material samples, offering extra information for students, answering questions from students, assisting with the development of exams and other assignments, and grading exams and assignments.

**National Taiwan University, Taipei, Taiwan, Agronomy Department**

* **Cell Biology** Spring 2008

Professor of record: Dr. Jaw-Shu Hsieh

Responsibilities included answering questions for students and grading exams

* **Molecular Genetics** Fall 2007

Professor of record: Dr. Jaw-Shu Hsieh

Responsibilities included answering questions for students and grading exams

**Professional Memberships and Academic Activities**

* American Society for Horticultural Science, National Member 2018
* International Plant Propagators' Society (IPPS), National Member 2017
* Pi Alpha Xi, Alpha Rho Chapter, OSU, Member 2016
* Plant Breeding and Genetics Student Association, OSU, Member 2016

**Academic Activities**

* Plant Breeding and Genetics Student Association, OSU, Vice President 2017
* Ornamental Aquarian Life Student Clube, NUK, cofounder and president 2007
* Student Orientation Camp of Life Science Department, NUK, President 2006
* Student Association of Life Science Department, NUK, NUK, President 2005
* Student Summer Camp of Life Science Department, NUK, President 2005

**Awards & Honors**

* George L. Crookham Memorial Scholarship, OSU 2018
* Oregon Nursery Foundation Memorial Award, Oregon Nurseries Foundation 2018
* Gilman C. Keasey Memorial Fellowship, OSU 2017
* Bruce Briggs Memorial Scholarship, International Plant Propagators Society 2017
* Travel Scholarship of the Independent Plant Breeders Conference, OSU 2016
* The Scholarship of Government Sponsorship for Overseas Study, Taiwan Gov. 2012
* Mr. Lu, Shou Geng Memorial Award - Agriculture Association of Taiwan 2009
* Scholarship from KNOW-YOU seed company, Taipei 2009

**Referee Service for Scientific Journals**

* Journal of the American Society for Horticultural Science
* Botanical Studies
* Plant Method
* PLOS ONE
* HortScience