

## CURRICULUM VITAE

**Fred G. Gmitter, Jr., UF Research Foundation Professor**

**May 2019**

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 Citrus Research and Education Center  
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<b>Education:</b>	B. A.	Rutgers - State Univ. of NJ	English	1978
	M. S.	Rutgers - State Univ. of NJ	Horticulture	1981
	Ph.D.	Univ. of Florida	Horticulture	1985

<b>Positions Held:</b>	Professor, Univ. of Florida, IFAS, CREC	1997-2011
	Associate Professor, Univ. of FL, IFAS, CREC	1991-1997
	Assistant Professor, Univ. of FL, IFAS	1985-1991
	Graduate Assistant, Univ. of FL, IFAS	1982-1985
	Research Assistant, Rutgers - State Univ. of NJ	1979-1981

**Appointment:** Research 0.95 FTE; Teaching 0.05 FTE

**Departmental Affiliation:**

Horticultural Sciences  
 Plant Molecular and Cellular Biology (PMCB)

**Honors and Awards:**

University of Florida Research Foundation Professor; 2011-2014.  
 Florida Fruit and Vegetable Association Researcher of the Year; 2011.  
 2019 UF/IFAS High Impact Research Publication: "Genomics of the Origin and the Evolution of Citrus", published in Nature

**Brief Description of Job Duties:**

The goal of this position is to provide leadership and expertise for a research program devoted first to the development of new citrus rootstock and scion cultivars for the Florida citrus industry. Classical and contemporary genetic approaches are utilized as appropriate for specific research objectives. Basic breeding and genetic research

objectives, along with applications of genomic science techniques, are pursued when information gained can contribute to increased efficiency in achievement of the breeding program objectives, or when the results can lead directly to cultivar improvements.

### **Cultivar Patents:**

Sugar Belle® ‘LB8-9’, mandarin hybrid. First commercial marketing, 2009; patent granted 2010.

Valquarius™ ‘SF14W-62’, sweet orange, 2010.

Valenfresh™ ‘N7-3’, sweet orange, 2010.

‘UF 950’, mandarin hybrid, 2013.

‘UF 914’, a grapefruit hybrid free of the compounds responsible for the “grapefruit juice effect”, 2015.

‘Bingo’, mandarin hybrid that is very early maturing, completely seedless, and easy to peel, 2017.

‘11-1-24’, sweet orange, a low seeded, midseason sweet orange, 2017.

### **Publications:**

#### **Book Chapters (last 6 years)**

**Chen, C.**, A. R. Lo Piero, and F. Gmitter Jr. Pigments in citrus. In: Pigments in Fruits and Vegetables; Genomics and Dietetics. Chen, C. (Ed.). Springer, New York. 2015, pp. 165-187.

**Omar, A. A.**, Dutt, M., Gmitter, F. G., and Grosser, J. W. Somatic embryogenesis: still a relevant technique in citrus improvement. In: In Vitro Embryogenesis in Higher Plants, Methods in Molecular Biology. Germana, M. A. and Lambardi, M. (Eds.). Springer, New York. 2016, pp. 289-327.

#### **Refereed Journal (last 6 years)**

Aritua, V., Achor, D., Gmitter, F. G., Albrigo, G., **Wang, N.** Transcriptional and microscopic analyses of citrus stem and root responses to *Candidatus Liberibacter asiaticus* infection. PLoS ONE, 2013, 8(9): e73742, DOI: 10.1371/journal.pone.0073742.

**Cancelon, P.F.** and **Gmitter Jr., F.G.** New grapefruit and pummelo cultivars with very low furanocoumarin contents are good candidates to provide a solution to the drug interaction problem. Fruit Processing, 2013, 23:126-129.

**Chen, C. and Gmitter Jr., F. G.** Mining of haplotype-based expressed sequence tag single nucleotide polymorphisms in citrus. *BMC Genomics*, 2013, 14:746. DOI:10.1186/1471-2164-14-746.

Fan, J., Chen, C., Achor, D.S., Brlansky, R.H., Li, Z-G., and **Gmitter Jr., F.G.** Differential anatomical responses of tolerant and susceptible citrus species to the infection of '*Candidatus Liberibacter asiaticus*'. *Physiological and Molecular Plant Pathology*, 2013, 83:69-74. DOI:10.1016/j.pmpp.2013.05.002

Germana, M. A., Aleza, P., Carrera, E., Chen, C., Chiancone, B., Constantino, G., Dambier, D., Deng, X., Federici, C. T., Froehlicher, Y., Guo, W., Ibanez, V., Juarez, J., Kwok, K., Luro, F., Machado, M. A., Naranjo, M., A., Navarro, L., Ollitrault, P., Rios, G., Roose, M. L., Talon, M., Xu, Q., and **Gmitter, F. G.** Cytological and molecular characterization of three gametoclones of *Citrus clementina*. *BMC Plant Biology*, 2013, 13:129. DOI:10.1186/1471-2229-13-129.

**Shen, X.**, Orbovic, V., Dutt, M., Castle, W. S., and Gmitter Jr., F. G. Direct shoot organogenesis in *Murraya paniculata* (L.) Jack: A prerequisite for genetic transformation. *HortScience*, 2013, 48:938-941.

**Chen, C.**, Bock, C. H., Okie, W. R., Gmitter Jr., F. G., Jung, S., Main, D., Beckman, T. G., and Wood, B. W. Genome-wide characterization and selection of expressed sequence tag simple sequence repeat primers for optimized marker distribution and reliability in peach. *Tree Genetics and Genomes*, 2014, 10.1007/s11295-014-0759-4.

Favaro, M. A., Micheloud, N. G., Roeschlin, R. A., Chiesa, M. A., Castagnaro, A. P., Vojnov, A. A., Gmitter Jr., F. G., Gadea, J., Rista, L. M., Gariglio, N. F., and **Marano, M. R.** Surface barriers of mandarin cv. 'Okitsu' leaves make a major contribution to canker disease resistance. *Phytopathology*, 2014, 104:970-976. <http://dx.doi.org/10.1094/PHYTO-10-13-0277-R>.

**Wei, X., Chen, C., Yu, Q., Gady, A., Yu, Y., Liang, G., and Gmitter Jr., F. G.** Novel expression patterns of carotenoid pathway-related genes in citrus leaves and fruits. *Tree Genetics and Genomes*, 2014, 10:439-448. 10.1007/s11295-013-0688-7.

Wei, X., Chen, C., Yu, Q., Gady, A., Yu, Y., Liang, G., and **Gmitter Jr., F. G.** Comparison of carotenoid accumulation and biosynthetic gene expression between Valencia and Rohde Red Valencia sweet oranges. *Plant Science*, 2014, 227:28-36. DOI: 10.1016/j.plantsci.2014.06.016.

Wu, G. A., Prochnik, S., Jemkins, J., Salse, J., Hellsten, U., Murat, F., Perrier, X., Ruiz, M., Scalabrin, S., Terol, J., Takita, M.A., Labadie, K., Poulain, J., Jabbari, K., Cattonaro, F., Del Fabbro, C., Pinosio, S., Zuccolo, A., Chapman, J.,

Grimwood, J., Tadeo, F. R., Estornell, L. H., Muñoz-Sanoz, J. V., Ibanez, V., Herrero-Ortega, A., Aleza, P., Pérez-Pérez J., Ramón, D., Brunel, D., Luro, F., Chen, C., Farmerie, W. G., Desany, B., Kodira, C., Mohiuddin, M., Harkins, T., Fredrikson, K., Burns, P., Lomsadze, A., Borodovsky, M., Reforgiato, G., Freitas-Astúa, J., Quetier, F., Navarro, L., Roose, M., Wincker, P., Schmutz, J., Morgante, M., Machado, M. A., Talon, M., Jaillon, O., Ollitrault, P., **Gmitter, F., and Rokhsar, D.** Sequencing of diverse mandarin, pummelo and orange genomes reveals complex history of admixture during citrus domestication. *Nature Biotechnology*, 2014, 32:656-662. doi:10.1038/nbt.2906.

Chen, C., Yu, Q., Wei, X., Cancalon, P. F., and **Gmitter Jr., F. G.** Identification of genes associated with low furanocoumarin content in grapefruit. *Genome*, 2015, 10:537-545. 1139/gen-2014-0164.

de Paula Santos Martins, C., Pedrosa, A. M., Du, D., Goncalves, L. P., Yu, Q., **Gmitter Jr., F. G., and Costa, M. G. C.** Genome-wide characterization and expression analysis of major intrinsic proteins during abiotic and biotic stresses in sweet orange (*Citrus sinensis* L. Osb.). *PLoS ONE*, 2015, 10(9): e0138786. doi:10.1371/journal.pone.0138786.

Du, D., Rawat, N., Deng, Z., and **Gmitter Jr., F. G.** Construction of citrus gene coexpression networks from microarray data using random matrix theory. *Horticulture Research*, 2015, 2. doi:10.1038/hortres.2015.26.

Rawat, N., Kiran, S. P., Du, D., Gmitter Jr., F. G., and **Deng, Z.** Comprehensive meta-analysis, co-expression, and miRNA nested network analysis identifies gene candidates in citrus against Huanglongbing disease. *BMC Plant Biology*, 2015, DOI 10.1186/s12870-015-0568-4.

Satpute, A. D., Chen, C., Gmitter Jr., F. G., Ling, P., Yu, Q., Grosser, M. R., and **Grosser, J. W.** Cybridization of grapefruit with ‘Dancy’ mandarin leads to improved fruit characteristics. *J. Amer. Soc. Hort. Sci.*, 2015, 140:427-435.

Yu, Q., Plotto, A., Baldwin, E. A., Bai, J., Huang, M., Yu, Y., Dhaliwal, H. S., and **Gmitter, F. G.** Proteomic and metabolomic analyses provide insight into production of volatile and non-volatile flavor components in mandarin hybrid fruit. *BMC Plant Biology*, 2015, 15:76. doi:10.1186.s12870-015-0466-9.

Chen, X., **Gao, Z.**, House, L., Ge, J., Zong, C. and Gmitter, F. Opportunities for western food products in China: the case of orange juice demand. *Agribusiness*, 2016, DOI: 10.1002/agr.21453.

Yu, Y., Chen, C., and **Gmitter Jr., F. G.** QTL mapping of mandarin (*Citrus reticulata*) fruit characters using high-throughput SNP markers. *Tree Genetics and Genomes*, 2016, 12:77, DOI 10.1007/s11295-016-1034-7.

Stover, E. W., Kahn, T., Roose, M., Siebert, T., Vidalakis, G., Krueger, R., Gmitter, F., and Grosser, J. Citrus. In: Register of New Fruit and Nut Cultivars List 48. Eds: Gasic, K, Preece, J. E., and Karp, D., HortScience, 2016, 51:620-652.

**Ferrarezi, R. S.**, Wright, A. L., Bowman, B. J., Schumann, A. W., Gmitter, F. G., and Grosser, J. W. Protected fresh grapefruit cultivation systems: Antipsyllid screen effects on plant growth and leaf transpiration, vapor pressure deficit, and nutrition. *HortTechnology*, 2017, 27:666-674 doi:10.21273/HORTTECH03789-17.

**Ferrarezi, R. S.**, Wright, A. L., Bowman, B. J., Schumann, A. W., Gmitter, F. G., and Grosser, J. W. Protected fresh grapefruit cultivation systems: Antipsyllid screen effects on environmental variables inside closures. *HortTechnology*, 2017; 27:675-681 doi:10.21273/HORTTECH03790-17.

Huang, M., Valim, M. F., Feng, S., Reuss, L., Yao, L., Gmitter, F., and **Wang, Y.** Characterization of the major aroma-active compounds in peel oil of an HLB-tolerant mandarin hybrid using aroma extraction dilution analysis and gas chromatography-mass spectrometry/olfactometry. *Chemosensory Perception*, 2017, doi 10.1007/s12078-017-9221-y.

Kawaguchi-Suzuki, M., Nasiri-Kenari, N., Shuster, J., Gmitter Jr., F. G., Cancalon, P., de Oliveira, F., Kight, J., Handberg, E. M., Pepine, C. J., Frye, R. F., and **Cooper-Dehoff, R.** Effect of low-furanocoumarin hybrid grapefruit juice consumption on midazolam pharmacokinetics. *The Journal of Clinical Pharmacology*, 2017, 57:305-311 doi: 10.1002/jcph.807.

**Killiny, N.**, Valim, M. F., Jones, S. E., Omar, A. A., Hijaz, F., Gmitter Jr., F. G., and Grosser, J. W. Metabolically speaking: Possible reasons behind the tolerance of ‘Sugar Belle’ mandarin hybrid to huanglongbing. *Plant Physiology and Biochemistry*, 2017, 116:36-47, doi: 10.1016/j.plaphy.2017.05.001.

Omar, A. A., Murata, M., Yu, Q., Gmitter Jr., F. G., Chase, C. D., Graham, J. H. and **Grosser, J. W.** Production of three new grapefruit cybrids with potential for improved citrus canker resistance. *In Vitro Cell. Dev. Biol.-Plant*, 2017, doi: 10.1007/s11627-017-9816-7.

Rawat, N, Kumar, B., Albrecht, U., Du, D., Huang, M., Yu, Q., Zhang, Y., Duan, Y-P., Bowman, K.D., Gmitter Jr., F.G., and **Deng, Z.** Genome resequencing and transcriptome profiling reveal structural diversity and expression patterns of constitutive disease resistance (CDR) genes in Huanglongbing-tolerant *Poncirus trifoliata* and its hybrids. *Horticulture Research* 4, 2017, doi:10.1038/hortres.2017.64.

Roeschlin, R. A., Favaro, M. A., Chiesa, M. A., Alemano, S., Vojnov, A. A., Castagnao, A. P., Filippone, M. P., Gmitter Jr., F. G., Gadea, J. and **Marano, M. A.** Resistance to citrus canker induced by a variant of *Xanthomonas citri* ssp. *citri* is associated with a hypersensitive cell death response involving autophagy-associated vacuolar processes. *Molecular Plant Pathology*, 2017, 18:1267-1281. Doi: 10.1111/mpp.12489.

Wei, X., Hu, H., Tong, H., and **Gmitter Jr., F. G.** Profiles of gene family members related to carotenoid accumulation in *Citrus* genus. *Journal of Plant Biology*, 2017, 60:1-10. doi 10.1077/s12374-016-0902-x.

Yu, Q., Chen, C., Du, D., Huang, M., Yao, J., Yu, F., Brlansky, R. H., and **Gmitter Jr., F. G.** Reprogramming of a defense signaling pathway in rough lemon and sweet orange is a critical element of the early response to '*Candidatus Liberibacter asiaticus*'. *Horticulture Research*, 2017, 4; doi:10.1038/hortres.2017.63.

Yu, Y., Bai, J., Chen, C., Plotto, A., Baldwin, E. A., and **Gmitter, F. G.** Comparative analysis of juice volatiles in selected mandarins, mandarin relatives and other citrus genotypes. *Journal of the Science of Food and Agriculture*, 2017, doi 10.1002/jsfa.8563.

Yu, Y., Bai, J., Chen, C., Plotto, A., Baldwin, E. A., and **Gmitter Jr., F. G.** Identification of QTLs controlling aroma volatiles using a 'Fortune' x 'Murcott' (*Citrus reticulata*) population. *BMC Genomics*, 2017, 18:646, doi 10.1186/s12864-017-4043-5.

Chen, L., Li, W., Katin-Grazzini, L., Ding, J., Gu, X., Li, Y., Gu, T., Wang, R., Lin, X., Deng, Z., McAvoy, R. J., Gmitter, F. G., Deng, Z., Zhao, Y., and **Li, Y.** A method for the production and expedient screening of CRISPR/Cas9-mediated non-transgenic mutant plants. *Horticulture Research*, 2018, 5:13, doi 10.1038/s41438-018-0023-4.

Du, D., Du, X., Mattia, M. R., Wang, Y., Yu, Q., Huang, M., Yu, Y., Grosser, J. W., and **Gmitter Jr., F. G.** LTR retrotransposons from the *Citrus x clementina* genome: characterization and application. *Tree Genetics and Genomes*, 2018, 14:43, <https://doi.org/10.1007/s11295-018-1257-x>.

Feng, S., Suh, J. H., Gmitter, F. G., and **Wang, Y.** Differentiation between flavors of sweet orange (*Citrus sinensis*) and mandarin (*Citrus reticulata*). *Journal of Agricultural and Food Chemistry*, 2018, 66:203-211. doi: 10.1021/acs.jafc.7b04968.

**Killiny, N.**, Jones, S., Nehela, Y., Hijaz, F., Dutt, M., Gmitter, F. G., and Grosser, J. W. All roads lead to Rome: Towards understanding different avenues of tolerance to Huanglongbing in citrus cultivars. *Plant Physiology and Biochemistry*, 2018, 129:1-10. <https://doi.org/10.1016/j.plaphy.2018.05.005>.

Huang, M., Roose, M. L., Yu, Q., Du, D., Yu, Y., Deng, Z., Stover, E., **Gmitter Jr., F. G.** Construction of high-density genetic maps and detection of QTLs associated with Huanglongbing tolerance in citrus. *Frontiers in Plant Science*, 2018, <https://doi.org/10.3389/fpls.2018.01694>.

Suh, J. H., Niu, Y. S., Wang, Z., Gmitter, F. G., and **Wang, Y.** Metabolic analysis reveals altered long-chain fatty acid metabolism in the host by Huanglongbing disease. *Journal of Agricultural and Food Chemistry*, 2018, 66:1296-1304. doi: 10.1021/acs.jafc.7b05273.

Wang, Z., Yu, Q., Shen, W., El Mohtar, C. A., Zhao, X. and **Gmitter Jr., F. G.** Functional study of *CHS* gene family members in citrus revealed a novel *CHS* gene affecting the production of flavonoids. *BMC Plant Biology*, 2018, 18:189. <https://doi.org/10.1186/s12870-018-1418-y>.

Wei, X., Song, M., Chen, C., Tong, H., Liang, G., and **Gmitter Jr., F. G.** Juice volatile composition differences between Valencia orange and its mutant Rohde Red Valencia are associated with carotenoid profile differences. *Food Chemistry*, 2018, 245:223-232. <https://doi.org/10.1016/j.foodchem.2017.10.066>.

**Wu, G. A.**, Terol, J., Ibanez, V., López-García, A., Pérez-Román, E., Borredá, C., Domingo, C., Tadeo, F. R., Carbonell-Caballero, J., Alonso, R., Curk, F., Du, D., Ollitrault, P., Roose, M. L., Dopazo, J., **Gmitter, F. G.**, **Rokhsar, D. S.**, and **Talon, M.** Genomics of the origin and evolution of *Citrus*. *Nature*, 2018, 554: 311–316. doi:10.1038/nature25447.

Yu, Y., Chen, C., Huang, M., Yu, Q., Du, D., Mattia, M. R., and **Gmitter Jr., F. G.** Genetic diversity and population structure analysis of citrus germplasm with single nucleotide polymorphism markers. *Journal of the American Society for Horticultural Science*, 2018, 143:399-408. <https://doi.org/10.21273/JASHS04394-18>.

Calovic, M., Yu, Q., Orbovic, V., Gmitter, F. G., Grosser J. W. and Chen, C. New somatic hybrid mandarin tetraploids generated by optimized protoplast fusion and confirmed by molecular marker analysis and flow cytometry. *Journal of the American Society for Horticultural Science*, 2019, 144:151-163. DOI: 10.21273/JASHS04563-18.

Deng, H., Achor, D., Etxeberria, E., Yu, Q., Du D., Stanton, D., Liang, G., and Gmitter, F. G. Phloem regeneration is a mechanism for Huanglongbing-tolerance

of 'Bearss' lemon and 'LB8-9' Sugar Belle<sup>®</sup> mandarin. *Frontiers in Plant Science*, 2019. DOI: 10.3389/fpls.2019.00277.

Yao, L., Yu, Q., Huang, M., Hung, W., Grosser, J., Chen, S., Wang, Y., and **Gmitter Jr., F. G.** Proteomic and metabolomic analyses provide insight into the off-flavour of fruits from citrus trees infected with 'Candidatus *Liberibacter asiaticus*'. *Horticulture Research*, 2019. DOI: 10.1038/s41438-018-0109-z.

Yu, Q., Huang, M., Jia, H., Yu, Y., Plotto, A., Baldwin, E. A., Bai, J., Wang, N., and Gmitter, F. G. Deficiency of valencene in mandarin hybrids is associated with a deletion in the promoter region of the valencene synthase gene. *BMC Plant Biology* 19, 2019. DOI: 10.1186/s12870-019-1701-6.

I certify by my signature below that the above record is true and accurate.

A handwritten signature in black ink, appearing to read "Fred G. Gmitter Jr.", written in a cursive style.

Fred G. Gmitter Jr.