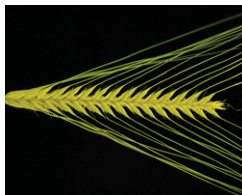


Contents

Vol. 199 No. 1 January 2015



Cover photo: Floret opening in many grass species allows for pollen dispersal and cross-pollination. The swelling of the lodicule is responsible for the opening of florets, but in barley, the closed floret habit (cleistogamy) is under the control of the gene *cl1*, which operates by inhibiting the development of the lodicule. Wang *et al.* (pp. 95–104) investigated a novel allele of *cl1* in barley cv. “France 1” that somehow escapes inhibiting the development of the lodicule. A higher level of DNA methylation at promoter represses *cl1* transcription. siRNA sequencing revealed methylation might be generated by ncRNAs. This cultivar can be manipulated by a pre-anthesis application of exogenous auxin 2,4-D to promote wide and prolonged opening of florets, a feature which may be of interest in the context of hybrid seed production of cleistogamous barleys. Image courtesy of Ning Wang and Takao Komatsuda.

GENETICS TOOLBOX REVIEW

- 1–15 **A Mouse Geneticist’s Practical Guide to CRISPR Applications**
Singh, Priti, John C. Schimenti, and Ewelina Bolcun-Filas
OPEN ACCESS

PRIMER

- 17–23 ***Drosophila* Oocytes as a Model for Understanding Meiosis: An Educational Primer to Accompany “Corolla Is a Novel Protein That Contributes to the Architecture of the Synaptonemal Complex of *Drosophila*”**
Ables, Elizabeth T.
OPEN ACCESS

INVESTIGATIONS

METHODS, TECHNOLOGY, AND RESOURCES

- 25–37 **Potency of Transgenic Effectors for Neurogenetic Manipulation in *Drosophila* Larvae**
Pauls, Dennis, Alina von Essen, Radostina Lyutova, Lena van Giesen, Ronny Rosner, Christian Wegener, and Simon G. Sprecher

- 39–59 **Positional Information, Positional Error, and Readout Precision in Morphogenesis: A Mathematical Framework**
Tkačik, Gašper, Julien O. Dubuis, Mariela D. Petkova, and Thomas Gregor

STATISTICAL GENETICS AND GENOMICS

- 61–71 **Dissecting Genetic Architecture Underlying Seed Traits in Multiple Environments**
Qi, Ting, Yujie Cao, Liyong Cao, Yongming Gao, Shuijin Zhu, Xiangyang Lou, and Haiming Xu

GENOME INTEGRITY AND TRANSMISSION

- 73–83 **Normal Segregation of a Foreign-Species Chromosome During *Drosophila* Female Meiosis Despite Extensive Heterochromatin Divergence**
Gilliland, William D., Eileen M. Colwell, David M. Osiecki, Suna Park, Deanna Lin, Chandramouli Rathnam, and Daniel A. Barbash

GENE EXPRESSION

- 85–93 **Gene Expression Variation in *Drosophila melanogaster* Due to Rare Transposable Element Insertion Alleles of Large Effect**
Cridland, Julie M., Kevin R. Thornton, and Anthony D. Long
HIGHLIGHTED ARTICLE OPEN ACCESS

- 95–104 An Epiallele at *cly1* Affects the Expression of Floret Closing (Cleistogamy) in Barley**
Wang, Ning, Shunzong Ning, Jianzhong Wu, Akemi Tagiri, and Takao Komatsuda
- 105–116 Maintenance of Nucleosomal Balance in *cis* by Conserved AAA-ATPase Yta7**
Lombardi, Laura M., Matthew D. Davis, and Jasper Rine
HIGHLIGHTED ARTICLE
- CELLULAR GENETICS
- 117–134 Signaling by the Engulfment Receptor Draper: A Screen in *Drosophila melanogaster* Implicates Cytoskeletal Regulators, Jun N-Terminal Kinase, and Yorkie**
Fullard, John F. and Nicholas E. Baker
- DEVELOPMENTAL AND BEHAVIORAL GENETICS
- 135–149 A Novel Cholinergic Action of Alcohol and the Development of Tolerance to That Effect in *Caenorhabditis elegans***
Hawkins, Edward G., Ian Martin, Lindsay M. Kondo, Meredith E. Judy, Victoria E. Brings, Chung-Lung Chan, GinaMari G. Blackwell, Jill C. Bettinger, and Andrew G. Davies
HIGHLIGHTED ARTICLE
- 151–156 Neuronal Development in *Caenorhabditis elegans* Is Regulated by Inhibition of an MLK MAP Kinase Pathway**
Baker, Scott T., Shane M. Turgeon, Erik D. Tulgren, Jeanne Wigant, Omeed Rahimi, Karla J. Opperman, and Brock Grill
- 157–163 A Novel Role for the Zinc-Finger Transcription Factor EGL-46 in the Differentiation of Gas-Sensing Neurons in *Caenorhabditis elegans***
Romanos, Teresa Rojo, Jakob Gramstrup Petersen, Alba Redo Riveiro, and Roger Pocock
- POPULATION AND EVOLUTIONARY GENETICS
- 165–176 Contrasting Modes and Tempos of Venom Expression Evolution in Two Snake Species**
Margres, Mark J., James J. McGivern, Margaret Seavy, Kenneth P. Wray, Jack Facente, and Darin R. Rokyta
HIGHLIGHTED ARTICLE
- 177–190 The Impact of Macroscopic Epistasis on Long-Term Evolutionary Dynamics**
Good, Benjamin H. and Michael M. Desai
- 191–203 A Framework for Inferring Fitness Landscapes of Patient-Derived Viruses Using Quasispecies Theory**
Seifert, David, Francesca Di Giallonardo, Karin J. Metzner, Huldrych F. Günthard, and Niko Beerenwinkel
OPEN ACCESS
- GENETICS OF COMPLEX TRAITS
- 205–222 Penalized Multimarker vs. Single-Marker Regression Methods for Genome-Wide Association Studies of Quantitative Traits**
Yi, Hui, Patrick Breheny, Netsanet Imam, Yongmei Liu, and Ina Hoeschele
HIGHLIGHTED ARTICLE

223–232 **A General Unified Framework to Assess the Sampling Variance of Heritability Estimates Using Pedigree or Marker-Based Relationships**
Visscher, Peter M. and Michael E. Goddard
[HIGHLIGHTED ARTICLE](#) [OPEN ACCESS](#)

233–245 **A Novel Cryptochrome-Dependent Oscillator in *Neurospora crassa***
Nsa, Imade Y., Nirmala Karunarathna, Xiaoguang Liu, Howard Huang, Brittni Boetteger, and Deborah Bell-Pedersen
[HIGHLIGHTED ARTICLE](#)

247–262 **Allelic Variation, Aneuploidy, and Nongenetic Mechanisms Suppress a Monogenic Trait in Yeast**
Sirr, Amy, Gareth A. Cromie, Eric W. Jeffery, Teresa L. Gilbert, Catherine L. Ludlow, Adrian C. Scott, and Aimée M. Dudley
[HIGHLIGHTED ARTICLE](#) [OPEN ACCESS](#)

CORRIGENDA

263 **Neuronal Remodeling During Metamorphosis is Regulated by the *alan shepard (shep)* Gene in *Drosophila melanogaster***
Chen, Dahong, Chunjing Qu, and Randall S. Hewes

265 **The 2011 George W. Beadle Award: Joseph R. Ecker**
Wessler, Susan R.