HENRY (HANK) WYMAN BASS
Curriculum vitae

Address: Department of Biological Science
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Research Interests:
Cellular biology and molecular genetics of meiotic telomere functions in maize (corn, *Zea mays* L.); cytogenetic mapping of maize the maize genome with 3-D fluorescence in situ hybridization (FISH); functional architecture of the nucleus; genomics

Education:

A.A.	1982	Oxford College of Emory University, Oxford, GA
B.S.	1985	Plant Pathology, University of Georgia, Athens, GA
	1987	Non-Program Research Technician & Student, Univ. of Georgia, Athens, GA
Ph.D.	1992	Botany/Plant Physiology, North Carolina State University, Raleigh, NC

Employment:

2005–present	Associate Professor of Biological Science, Florida State Univ, Tallahassee, FL.
1997–2005	Assistant Professor of Biological Science, Florida State Univ, Tallahassee, FL.
1998–present	Molecular Biophysics Graduate Faculty, Florida State Univ., Tallahassee, FL.
1998–present	Courtesy Assistant Professor, Horticultural Sciences Department, University of Florida, Gainesville, FL.
1994–1997	Postdoctoral Fellow of the Life Sciences Research Foundation, D.O.E.
1992–1997	Postdoctoral research, with W. Zacheus Cande at UC Berkeley and John W. Sedat at UC San Francisco. 3D molecular cytology of meiosis in maize.
1987–1992	Graduate Research Assistantship, with Dr. Rebecca S. Boston, Botany Dept., North Carolina State University. Thesis - plant molecular biology & biochemistry of maize ribosome-inactivating proteins.
1985–1987	Research Scientist/Lab Technician; with Dr. Glenn A. Galau, Botany Dept., University of Georgia. Plant molecular biology of cotton *LEA* genes.

RESEARCH

Grants received as PI at FSU:

1998 FSU-FYAP $10,000 05/98 – 08/98
FSU - First-year Assistant Professor Award (FYAP)

1999 FSU-PEG-1999 $100,000 08/99 – 08/01
Creation of a New Cytogenetic Map for Maize
FSU Research Foundation Cornerstone Program Enhancement Grant (PEG)

2000 FSU CRC-Planning Grant $10,000 11/00 – 11/01
DNA Microarray Project
Council on Research and Creativity (CRC) Planning Grant.

2001 DOE-CPBR OR22072-102 $20,000 5/01 – 4/02
CPBR Fellowship for Development of Map-based Cloning for Maize
Consortium for Plant Biotechnology Research, Inc.

2001 NSF MCB-0091095 $360,000 4/01 – 3/05
Analysis of Meiotic Telomere Functions
NSF-REU Supplements (Research Experiences for Undergraduates):
- supplement MCB-0139115 $6,995 9/01 – 8/02 Hay & Steele
- supplement MCB-0244008 $15,000 10/02 – 9/03 Figueroa, Hay, & Jones.

2003 NSF DBI-0321639 $1,602,452 (including supplements) 9/03 – 8/09
Cytogenetic Map of Maize
NSF Plant Genome Research Program – Individual Small Grant Award (ISGA)
- supplement $46,720 RFLP probe sequencing project 3/06 – 8/07
- NSF-REU supplement $6,750, 7/07 – 8/08, Davis, Beckham

2008 FSU CRC-Planning Grant $12,000 4/08 – 5/09
New Reagents for Localization of Maize SMH1 Protein In Vivo
Council on Research and Creativity (CRC)/Cornerstone Planning Grant Program.

2009 NIH 1R01AG034067-01 (co-investigator; lead PI - RJ Turner) 9/09 – 8/14
Health Disparities and Stress Hypothesis
National Institute on Aging

Awards and Patents:

Awards

1989 Sigma Xi Annual Award for Group Research, University of Georgia Sigma X

2002 Performance-based bonus award for Arts and Sciences Faculty for 2001 – 2002.

2008 Beta Beta Beta Biological Honor Society Honorary Professor of the Year

Patents

1994 Co-inventor, U.S. Patent 5332808 issued 07/26/1994,
DNA encoding a ribosome inactivating protein. Boston, Bass, and OBrian.

1996 Co-inventor, U.S. Patent 5552140 issued 09/03/1996,
DNA encoding a ribosome-inactivating protein. Boston, Bass, and OBrian.

2006 Co-inventor, U.S. Patent 7074985 issued 07/11/2006
Development of a Stress-Responsive promoter from maize.
Helentjaris, Bass, and Boston

Refereed Publications:

Galau, G.A., H.W. Bass, and D.W. Hughes. (**1988**) Restriction fragment length polymorphisms in diploid and allotetraploid *Gossypium*: assigning the late embryogenesis-abundant (*Lea*) alloalleles in *G. hirsutum*. ***Molecular and General Genetics*** **211**:305–314.

Wyatt, R., I.J. Odrzykoski, A. Stoneburner, H.W. Bass, and G.A. Galau. (**1988**) Multiple origins of *Plagiomnium medium*. ***Proceedings of the National Academy Sciences of the USA*** **85**:5601–5604.

Bass, H.W., C. Webster, G.R. OBrian, J.K.M. Roberts and R.S. Boston. (**1992**) A maize ribosome-inactivating protein is controlled by the transcriptional activator *Opaque-2*. ***Plant Cell*** **4**:225–234.

Bass, H.W., J.H. Goode, T.W. Greene and R.S. Boston. (**1994**) Control of ribosome-inactivating protein (RIP) RNA levels during maize seed development. ***Plant Science*** **101**:17–30.

Bass, H.W., G.R. OBrian, and R.S. Boston. (**1995**) Cloning and sequencing of a second ribosome-inactivating protein gene from maize (*Zea mays* L.). ***Plant Physiology*** **107**:661–662.

Gillikin, J.W., F. Zhang, C.E. Coleman, H.W. Bass, B.A. Larkins, and R.S. Boston. (**1997**) A defective signal peptide tethers the *floury-2* zein to the ER-membrane. ***Plant Physiology*** **114**:345–352.

Bass, H.W., W.F. Marshall, J.W. Sedat, D.A. Agard, and W.Z. Cande. (**1997**) Telomeres cluster *de novo* before the initiation of synapsis: a three-dimensional spatial analysis of telomere positions before and during meiotic prophase. ***Journal of Cell Biology*** **137**:5–18.

Wein, H., H.W. Bass, and W.Z. Cande. (**1998**) DSK1, a kinesin-related protein involved in anaphase spindle elongation, is a component of the mitotic spindle matrix. ***Cell Motility and the Cytoskeleton*** **41**:214–224.

Bass, H.W., S. Nagar, L. Hanley-Bowdoin, and D. Robertson. (**2000**) Chromosome condensation induced by geminivirus infection of mature plant cells. ***Journal of Cell Science*** **113**(7):1149–1160.

Bass, H.W., O. Riera-Lizarazu, E.V. Ananiev, S.J. Bordoli, H.W. Rines, R.L. Phillips, J.W. Sedat, D.A. Agard, and W.Z. Cande. (**2000**) Evidence for the coincident initiation of homolog pairing and synapsis during the telomere-clustering (bouquet) stage of meiotic prophase. ***Journal of Cell Science*** **113**(6):1033–1042.

Ring, B. C., H.W. Bass, and D. Garza. (**2000**) Construction and transposition of a 100-kilobase "extended" P element in *Drosophila.* ***Genome Research*** **10**:1605–1616

Bass, H.W., S.J. Bordoli, and E.M. Foss. (**2003**) The *desynaptic* (*dy*) and *desynaptic1* (*dsy1*) mutations in maize (*Zea mays* L.) cause distinct telomere-misplacement phenotypes during meiotic prophase. ***Journal of Experimental Botany*** **54**(380):39–46

Franklin A.E., I.N. Golubovskaya, H.W. Bass, and W.Z. Cande. (**2003**) Improper chromosome synapsis is associated with elongated Rad51 structures in the maize *desynaptic2* mutant. ***Chromosoma*** **112**:17–25.

Koumbaris, G.L. and H.W. Bass (**2003**). A new single-locus cytogenetic mapping system for maize (*Zea mays* L.): overcoming FISH detection limits with marker-selected sorghum (*S. propinquum* L.) BACs clones. ***Plant Journal*** **35**:647–659.

Marian, C.O., S.J. Bordoli, M. Goltz, R.A. Santarella, L.P. Jackson, O. Danilevskaya, M. Beckstette, R. Meeley, and H.W. Bass (**2003**). The maize *Single myb histone 1* Gene, *Smh1*, belongs to a novel gene family and encodes a protein that binds telomere DNA repeats in vitro. ***Plant Physiology*** **133**:1336–1350.

Bass, H.W. (**2003**) Telomere dynamics unique to meiotic prophase: formation and significance of the bouquet. ***Cellular and Molecular Life Sciences (CMLS)*** **60:**2319–2324.

Palko, L., H.W. Bass, M.J. Beyrouthy, and M.M. Hurt. (**2004**) The Yin Yang-1 (YY1) protein undergoes a DNA replication-associated switch in location from the cytoplasm to the nucleus at the onset of S phase. ***Journal of Cell Science*** **117**:465–476.

Anderson, L.K., N. Salameh, H.W. Bass, L.C. Harper, W.Z. Cande, G. Weber, and S.M. Stack. (**2004**) Integrating genetic linkage maps with pachytene chromosome structure in maize. ***Genetics*** **166**(4):1923 – 1933.

Bass H.W., J.E. Krawetz, G.R. OBrian, C. Zinselmeier, J.E. Habben, and R.S. Boston. (**2004**) Maize ribosome-inactivating proteins (RIPs) with distinct expression patterns have similar requirements for proenzyme activation. ***Journal of Experimental Botany*** **55**(406)2219–2233.

Marian C.O. and H.W. Bass. (**2005**) The *Terminal acidic SANT 1* (*Tacs1*) gene of maize is expressed in tissues containing meristems and encodes an acidic SANT domain similar to some chromatin-remodeling complex proteins. ***Biochemica Biophysica Acta – Gene Structure and Expression*** **1727**(2):81–86.

Lawrence C.J., T.E. Seigfried, H.W. Bass, and L.K. Anderson. (**2006**) Predicting chromosomal locations of genetically mapped loci in maize using the *Morgan2McClintock* translator. ***Genetics*** 173(3):2007–2009.

Amarillo F.E. and H.W. Bass. (**2007**) A Transgenomic cytogenetic sorghum (*Sorghum propinquum*) BAC FISH map of maize (*Zea mays* L.) pachytene chromosome 9, evidence for regions of genome hyperexpansion. ***Genetics*** (Nov)177:1509-1526.

Okagaki RJ, Jacobs MS, Stec AO, Kynast RG, Buescher E, Rines HW, Isabel Val es MI, Riera-Lizarazu O, Schneerman M, Doyle G, Friedman KL, Staub RW, Weber DF, Kamps TL, Amarillo IFE, Chase CD, Bass HW, and Phillips RL. (**2008**) Maize centromere mapping: A comparison of physical and genetic strategies. ***J Hered*** 99(2):85-93.

Beyrouthy MJ, Alexander KE, Baldwin A, Whitfield ML, Bass HW, McGee D, and Hurt MM. (**2008**) Identification of G1-Regulated Genes in Normally Cycling Human Cells. ***PLoS ONE*** 3(12): e3943 doi:10.1371/journal.pone.0003943.

Book Chapters, Newsletters, and other non-refereed Articles:

Bass, H.W., P.H. Sisco, D.L. Murray, and R.S. Boston (**1990**). Probes for the b-32 protein hybridize to loci on 7L and 8L. *Maize Genetics Newsletter* **64**:97.

Shank, B.B., H.W. Bass, P.H. Sisco, E. Wurtzel, and R.S. Boston (**1990**). Isolation and mapping of a cDNA probe for the b-70 protein. *Maize Genetics Newsletter* **64**:97.

Bass, H.W. (**1990**). A simple, efficient method for plaque purifying lambda phage clones by filter hybridizations. *The Plant Molecular Biology Promoter (N.C.)* **1**:24–25.

Dernburg, A.F., J.W. Sedat, W.Z. Cande, and H.W. Bass (**1995**). Cytology of telomeres. In *Telomeres* (ed. E. H. Blackburn and C. W. Greider), pp. 295 – 338. Cold Spring Harbor Lab Press, Plainview, N.Y.

Bass, H.W. (**2001**) Chromosomes. In *Plant Sciences for Students* (ed. R. Robinson), MacMillan References, USA.

Bass, H. W., L. C. Kang, A. Eyzaguirre (**2001**) Tom Thumb, a useful popcorn. *Maize Genetics Newsletter* **75**:62–63.

Bass, H.W., and S.J. Bordoli (**2001**) Variable distribution of meiotic homologs; on-line spinning projections of 3D data from chromosome painting and telomere FISH analysis of OMAd9.2. *Maize Genetics Newsletter* **75**:63.

Koumbaris, G., and H.W. Bass (**2002**). Pachytene arm ratios for maize chromosome 9 in OMAd9.2, a maize chromosome addition line of oat. *Maize Genetics Newsletter* **76**:62–63.

Bass, H.W. (**2003**). Multi-author review (MAR) introduction: The conservation and divergence of telomeric structures, effects, and functions. *Cellular and Molecular Life Science (CMLS)* **60**:2281-2282.

Bassie, Y.R., O.U. Onokpise, W.E. Odland, and H.W. Bass (**2004**) FISH analysis of retroelement distribution patterns along mitotic chromosomes. *Maize Genetics Newsletter* **78**:(59).

Figueroa, D.M. and H.W. Bass (**2004**) The *Single myb histone* (*Smh*) gene family of maize; detection of two PCR products from maize with primers for *Smh1*. *Maize Genetics Newsletter* **78**:(58-59).

Birchler, J.A. and H.W. Bass (**2009**). Cytogenetics and chromosomal structural diversity. In *The Maize Handbook, Genetics and Genomics*, (eds. JL Bennetzen and S Hake); Springer, USA pp. 163-177.

Bass, H.W. (2009) Chapter 9. Chromosomes. In *Lewin's GENES X*. (eds. JE Krebs, ES Goldstein, and ST Kilpatrick); Jones and Bartlett Publishers, (publish 12/2009, copyright 2011).

Invited Seminars & Lectures, 1998 – present:

Pioneer Hi-Bred, *3D Molecular Cytology of Meiotic Telomere Behavior in Maize.* Host Dr. Olga Danilevskaya, Des Moines, IA, (Apr. **2000**).

Annual Mtg of the American Society of Agronomy, Crop Science Society of America, and the Soil Science Society of America; Symposium on Plant Cytogenetics in the New Millennium, *3D cytogenetics of telomere behavior and chromosome pairing during meiosis*." Organizers Dr. B. Gill & Dr. J. Jiang, Minneapolis, MN, (Jan. **2001**).

Department of Agronomy, University of Florida, *Analysis of meiotic telomere functions; 3D cytogenetics in pollen mother cells.* Host M. Gallo-Meagher, Gainesville, FL (Mar. **2001**).

Trinity United Methodist Church, Lay Academy – Hot Topics in Science, *The Human Genome Project*, Host Liz Smith, Tallahassee, FL, (Apr. **2002**).

Annual meeting of the Society for Experimental Biology; *Analysis of meiotic telomere functions in maize.* Organizer Dr. N. Franklin-Tong, Swansea, Wales, (Apr. 8-12, **2002**)

Plant & Animal Genome XI Conference; *Telomere behavior at meiotic prophase in higher plants.* Organizer Dr. H. de Jong, San Diego, CA, (Jan. **2003**).

100th Annual Meeting of the Southern Association of Agricultural Scientists, Biochemistry and Biotechnology Division; *Meiotic Chromosomes in 3D: Structure and Function.* Organizer Dr. Jeffrey O. Boles, Mobile, AL, (Mar. **2003**)

University of Illinois, Dept. of Crop Sciences; *3D analysis of meiotic telomere functions in maize.* Host Dr. Stephen P. Moose, Urbana, IL, (Mar. **2003**)

Texas A & M University, Genetics; *3D FISH Analysis of Meiotic Telomere Clustering in Maize*. Host Dr. Dorothy Shippen, Texas A&M University, TX, (Feb. **2004**)

University of North Dakota, Dept. of Biology; *Analysis of the bouquet stage of meiosis in maize*. Host Dr. William F. Sheridan, Grand Forks, ND, (Apr. **2004**)

University of Nebraska, Lincoln; *Molecular cytology of telomeres and chromosomes during meiosis in maize.* Host Dr. Jim Alfano, Annual Plant Science Fall Retreat, Niobrara State Park; Niobrara, NE, (Sep. **2004**)

University of Florida, Gainesville; *Structure and Function of the Meiotic Prophase Chromosomes of Maize*. Host Dr. Kevin M. Folta, Department of Horticultural Sciences, Gainesville, FL, (Oct. **2006**)

Florida A&M University, Tallahassee; *Structure and Function of the Meiotic Prophase Chromosomes of Maize.* Host Dr. Jiang Lu, Center for Viticulture and Small Fruit Research, FAMU, Tallahassee, FL, (Oct. **2006**)

Florida A&M University, NSF workshop on plant genetics (host, CSHL) (June **2007**)

University of Florida, Plant Cytogenetics, Guest Lecture, (host Quesenberry) (Sep. **2007**)

University of Arizona; *Analysis of Telomeric Proteins in Maize*, Host Dr. Ravi Palanivelu, Department of Plant Sciences, Tucson, AZ (Feb. **2009**)

Conference, Meeting, or Symposium Presentations: 1998 – present
(* indicates presenting author)

WZ Cande*, AE Franklin, C Cowan, E Kaszas, HW Bass, L Harper, & PM Carlton (TALK) *Meiotic prophase chromosome behavior in maize*. Plant & Animal Genome VII Conf., San Diego; CA, Jan. 17-19, **1999**

HW Bass* & D Garza (POSTER) *Development of map-based cloning for maize*. Symposium of the Consortium for Plant Biotechnology Research, Inc.; Washington, D.C. March 2, **1999**.

HW Bass* (POSTER) *The development of map-based cloning tools for maize*. Cambridge Healthtech Institute's Second Annual Symposium on Impact of Molecular Biology on Crop Production and Crop Protection; Minneapolis, MN. August, **1999**.

BC Ring*, HW Bass, & D Garza (TALK) *In vivo construction and transposition of a 100 Kb P element.* Southeast Drosophila Research Conference; Emory University. Atlanta, GA. Nov 13-14, **1999**.

D Garza*, BC Ring, S Khatri, C Trivigno, & HW Bass (POSTER) *Development of a new method for functional analysis of the Drosophila genome: In vivo construction and transposition of a 100kb P element*. 41st Annual Drosophila Research Conference; Pittsburgh, PA, March 22-26, **2000**.

HW Bass*, MK Goltz, & G Koumbaris (TALK) *Analysis of meiotic telomere behavior*. 11th Annual Plant Molecular & Cellular Biology Workshop; Crystal River, FL. May 12-13, **2000**.

L Palko*, HW Bass, & MM Hurt (POSTER I-136) *YY1 and histone gene regulation - Temporal changes in cellular localization*. Cell Cycle Meeting, Keystone Symposia, Taos, NM, November 5-9, **2000**.

HW Bass*, O Danilevskaya, M Goltz, & RA Santarella. (POSTER) *Towards analysis of meiotic telomere functions.* 43rd Annual Maize Genetics Conference; Lake Geneva, WI, February 1, **2001**.

GL Koumbaris* & HW Bass. (TALK) *3D FISH analysis of the structure of maize chromosome 9*. Twelfth Annual Plant Molecular & Cellular Biology Workshop; Daytona Beach, FL, May 4-5, **2001**.

GL Koumbaris*, RD Swofford, & HW Bass. (POSTER) *3D FISH analysis of the structure of maize chromosome 9*. 44th Annual Maize Genetics Conference. Orlando, FL, March 14-17, **2002**.

MM Goltz*, RA Santarella, O Danilevskaya, & HW Bass. (POSTER) *Identification of a telomere DNA binding protein in maize*. 44th Annual Maize Genetics Conference; Orlando, FL. March 14–17, **2002**.

G Koumbaris, RD Swofford, & HW *Bass. (POSTER) *Single-locus cytogenetic mapping in maize (Zea mays); Localization of three maize-RFLP-selected sorghum BACs by FISH with maize chromosome-addition lines of oat*. Plant & Animal Genome XI Conference; San Diego, CA. January 11–15 **2003**.

GL Koumbaris and HW Bass*. (POSTER) *Single-locus cytogenetic mapping in maize with marker-selected sorghum BACs as FISH probes on pachytene spreads from maize-chromosome-addition lines of oat*. 45th Annual Maize Genetics Conference. Lake Geneva, WI, March 13–15, **2003**.

CO Marian*, M Goltz, RA Santarella, O Danilevskaya, R Meeley, & HW Bass (POSTER) *Isolation and characterization of a maize cDNA encoding a telomere repeat DNA oligonucleotide-binding protein*. 45th Annual Maize Genetics Conference. Lake Geneva, WI March 13–15, **2003**.

MJ Beyrouthy*, L Palko, KE Alexander, HW Bass & MM Hurt. (POSTER) *Coordinate regulation of YY1 subcellular localization and DNA synthesis*. Cold Spring Harbor Laboratory Meeting; Mechanisms of Eukaryotic Transcription. Cold Spring Harbor, NY, August 27–31, **2003**.

HW Bass*, GL Koumbaris, & CJ Lawrence (POSTER) *A Cytogenetic Map of Maize with Sorghum BAC FISH Probes.* NSF Plant Genome Research Program Awardee Meeting, Arlington VA, September 18–21, **2003**.

CJ Lawrence*, GL Koumbaris, HW Bass, TE Seigrired, & V Brendel (POSTER B687) *Cytogenetic Mapping and Cellular Localization Data Available at MaizeGDB*. 43rd Annual Meeting of the American Society for Cell Biology, San Francisco, CA, December 13–17, **2003**.

MJ Beyrouthy*, HW Bass, L Palko, & MM Hurt (POSTER) *The Yin Yang-1 (YY1) protein undergoes a DNA-replication-associated switch in localization from the cytoplasm to the nucleus at the onset of S phase*. The Miami Nature Biotechnology Winter Symposia: The Cell Cycle, Chromosomes and Cancer; Miami Beach, FL; January 31–February 4, **2004.**

HW Bass*, FE Amarillo, & CJ Lawrence (POSTER) *Cytogenetic Mapping of Maize with Sorghum BAC FISH Probes* 46th Maize Genetics Conference; Mexico City, Mexico; March 11–14, **2004.**

LK Anderson*, N Salameh, HW Bass, L Harper, WZ Cande, G Weber, & S Stack. (POSTER) *Integrating genetic linkage maps with pachytene chromosome structure in maize.* 46th Maize Genetics Conference; Mexico City, Mexico; March 11–14, **2004.**

CO Marian* & HW Bass (TALK) *The maize* Single Myb Histone 1 *gene,* Smh1*, encodes a protein that binds telomere DNA repeats in vitro and belongs to a new class of plant genes.* Fifteenth Annual Plant Molecular and Cellular Biology Workshop; Daytona Beach, FL, May 8-10, **2004**.

HW Bass (INVITED PARTICIPANT) PlantGDB/MaizeGDB annotation tool and curation workshop, Iowa State University, Ames, IA, August 27, **2004**.

HW Bass*, FE Amarillo, CJ Lawrence, & DM Figueroa (POSTER) *A Cytogenetic Map of Maize with Sorghum BAC FISH Probes*. NSF Plant Genome Research Program Awardee Meeting, Arlington VA, September 23-24, **2004.**

HW Bass*, MD Hay, RJ Hill, KA McLaughlin, CJ Hale, EH Jones, MS Conejo, K Graffius-Ashcraft, & K Onokpise (POSTER) *The Maize-10-Maze project, a public field replica the maize pachytene karyotype, decorated with mutants.* 47th Maize Genetics Conference; Lake Geneva, WI; March 10–13, **2005.**

DM Figueroa*, CL Strobel, BR Ring, & HW Bass (POSTER) *Development of a Pachytene Cytogenetic FISH Map of the 90 Core Bin Marker Loci.* 47th Maize Genetics Conference; Lake Geneva, WI; March 10–13, **2005.**

FE Amarillo*, CJ Lawrence, & HW Bass (POSTER) *Construction of a High-Density Cytogenetic Map of Maize Chromosome 9.* 47th Maize Genetics Conference; Lake Geneva, WI; March 10–13, **2005.**

AN Brown*, N Lauter, & HW Bass (POSTER) *QTL Mapping of Telomere Length-Regulating Factors*. 47th Maize Genetics Conference; Lake Geneva, WI; March 10–13, **2005.**

CO Marian* & HW Bass (POSTER) *The* Terminal acidic SANT 1 *(*Tacs1*) gene of maize is expressed in tissues containing meristems and encodes an acidic SANT domain similar to some chromatin-remodeling complex proteins.* 47th Maize Genetics Conference; Lake Geneva, WI; March 10–13, **2005.**

HW Bass*, DM Figueroa, FE Amarillo, BC Ring, TE Seigfried, & CJ Lawrence (POSTER) *A Cytogenetic Map of Maize in Oats with Sorghum BAC FISH Probes*. NSF Plant Genome Research Program Awardee Meeting, Arlington VA, September 8-9, **2005.**

FE Amarillo* & HW Bass (**TALK**) *Construction Of A High-Density Cytogenetic Map Of Maize Chromosome 9.* Plant and Animal Genome XIV Conference; San Diego, CA; January 14-18, **2006**.

DM Figueroa, FE Amarillo, BC Ring, CE Strobel, CJ Lawrence, & HW Bass* (POSTER) *A Cytogenetic Map Of Maize In Oat Addition Lines Using Sorghum BACs As FISH Probes.* Plant and Animal Genome XIV Conference; San Diego, CA; January 14-18, **2006**.

CJ Lawrence*, FE Amarillo, TE Seigfried, HW Bass, & LK Anderson (POSTER) *Predict Chromosomal Locations Of Genetically Mapped Loci In Maize Using The Morgan2McClintock Translator.* Plant and Animal Genome XIV Conference; San Diego, CA; January 14-18, **2006**.

JM Moore* & HW Bass (TALK) *Plant telomeric proteins.* 103rd Annual Meeting of the Southern Association of Agricultural Scientists, Biochemistry Division; Organizer Dr. Jeffrey O. Boles, Orlando FL, February, **2006**

CO Marian & HW Bass* (TALK) *Identification of gene families encoding double-stranded telomere repeat DNA-binding and related proteins.* 48th Maize Genetics Conference; Asilomar Conference Grounds, Pacific Grove, CA March 9–12, **2006.**

FE Amarillo*, HW Bass, & CJ Lawrence (POSTER**)** *Construction of a High-Density Cytogenetic Map of Maize Chromosome 9 Using Sorghum BACs as FISH Probe*. 48th Maize Genetics Conference; Asilomar Conference Grounds, Pacific Grove, CA March 9–12, **2006.**

DM Figueroa*, FE Amarillo, BC Ring, CL Strobel, CJ Lawrence, & HW Bass (POSTER) *Constructing a Cytogenetic Map of Maize Core Bin Markers in Oat Addition Lines Using Sorghum BACs as FISH Probes.* 48th Maize Genetics Conference; Asilomar Conference Grounds, Pacific Grove, CA March 9–12, **2006.**

CJ Lawrence*, TE Seigfried, LK Anderson, FE Amarillo, HW Bass (POSTER) *Predicting Chromosomal Locations of Genetically Mapped Loci in Maize Using the* Morgan2McClintock *Translator.* 48th Maize Genetics Conference; Asilomar Conference Grounds, Pacific Grove, CA March 9–12, **2006.**

R Okagaki*, M Jacobs, M Schneerman, R Kynast, E Buescher, FE Amarillo, CJ Lawrence, A Stec, T Kamps, C Chase, HW Rines, D Weber, HW Bass, & Phillips (POSTER) *A Comparison of Centromere Mapping Techniques.* 48th Maize Genetics Conference; Asilomar Conference Grounds, Pacific Grove, CA March 9–12, **2006.**

HW Bass*, FE Amarillo, DM Figueroa, BC Ring, AT Morganti, NC Fredette, JD Davis, & CJ Lawrence (POSTER) *A Cytogenetic Map of Maize with Sorghum BAC FISH Probes.* NSF Plant Genome Research Program Awardee Meeting; Arlington VA, September 7–8, **2006**.

KD Beckham*, DM Figueroa, FE Amarillo, CJ Lawrence, & HW Bass (POSTER, 3rd Place Award) *Isolation and Characterization of Sorghum BACs for Cytogenetic Mapping of Maize Genome.* Tri-Beta Biological Honor Society Second Annual Poster Board Competition; FSU College of Medicine, Tallahassee, FL, November 16, **2006**.

JD Davis*, GL Koumbaris, DM Figueroa, & HW Bass (POSTER, 4th Place Award) *Sequence Analysis of Maize RFLP Markers for in Silico Screening*. Tri-Beta Biological Honor Society Second Annual Poster Board Competition; FSU College of Medicine, Tallahassee, FL, November 16, **2006**.

NC Fredette*, SP Murphy, & HW Bass (POSTER) *Mapping a Meiosis-Specific Maize Mutant by Bulked-Segregant Analysis*. Tri-Beta Biological Honor Society Second Annual Poster Board Competition; FSU College of Medicine, Tallahassee, FL, Nov. 16, **2006**.

LB Ritchey*, AN Brown, N Lauter, & HW Bass (POSTER, 1st Place Award) *Analysis of DNA for QTL Mapping of Genetic Factors That Control Telomere Length in Maize.* Tri-Beta Biological Honor Society Second Annual Poster Board Competition; FSU College of Medicine, Tallahassee, FL, November 16, **2006**.

DM Figueroa, FE (Ina) Amarillo, NC Fredette, AT Morganti, JD Davis, CJ Lawrence, & HW Bass* (POSTER) P349: *Constructing A Cytogenetic Map Of The Maize Genome* Plant & Animal Genomes XV Conference; San Diego, CA, January 13-17, **2007**.

FE (Ina) Amarillo* & HW Bass. (TALK) T5: *Construction of a Sorghum BAC-based Cytogenetic Map of Maize Pachytene Chromosome 9*. 49th Annual Maize Genetics Conference; St. Charles, IL, March 22-25, **2007**.

DM Figueroa*, FE Amarillo, CE Strobel, CJ Lawrence, & HW Bass. (POSTER) P60: *Constructing A Cytogenetic Map Of Maize Core Bin Markers In Oat Addition Lines Using Sorghum BACs As FISH Probes.* 49th Annual Maize Genetics Conference; St. Charles, IL, March 22-25, **2007**.

KD Beckham*, DM Figueroa, FE Amarillo, & HW Bass. (POSTER) *Isolation and Characterization of Sorghum BACs for Cytogenetic Mapping of the Maize Genome.* FSU Undergraduate Research Symposium, Florida State University, Tallahassee, FL, April 5, **2007**.

JD Davis*, GL Koumbaris, DM Figueroa, & HW Bass. (POSTER) *Analysis of Maize RFLP Markers: Enabling in Silico Screens for Sorghum BAC FISH probes.* FSU Undergraduate Research Symposium, Florida State University, Tallahassee, FL, April 5, **2007**.

NC Fredette*, SP Murphy, & HW Bass. (TALK) *Mapping a Meiosis-Specific Mutant by Bulked-Segregant Analysis.* FSU Undergraduate Research Symposium, Florida State University, Tallahassee, FL, April 5, **2007**.

SP Murphy* & HW Bass. (TALK) *Molecular Genetic and Cytological Characterization of Meiotic Chromosome Segregation Mutants in Maize.* 2007 Annual Workshop; Jacksonville Beach, FL, May 18-19, **2007**.

DM Figueroa*, FE Amarillo, KD Beckham, JD Davis, CJ Lawrence, & HW Bass. (POSTER) *Constructing A Cytogenetic Map Of Maize In Oat Addition Lines Using Sorghum BACs As FISH Probes.* 50th Annual Maize Genetics Conference; Washington, DC, Feb 27 – Mar 2, **2008**.

SP Murphy* and HW Bass. (POSTER) *Towards the Molecular Cloning of Meiotic Telomere Behavior Mutants in Maize.* 50th Annual Maize Genetics Conference; Washington, DC, Feb 27 – Mar 2, **2008**.

NC Fredette*, JD Davis, D. St. Jean, RE Gabriel, AT Morganti, MD Hay, K Graffius-Ashcraft, RJ Hill, J Doster, O Onokpise, & HW Bass. (POSTER) *The Maize-10-Maze Project, an Educational Public Chromosome Map Garden Featuring the Magnificent Mutants of Maize.* 50th Annual Maize Genetics Conference; Washington, DC, Feb 27 – Mar 2, **2008**.

JD Davis* DM Figueroa, BC Ring, MS Conejo, FIE Amarillo, CL Strobel, & HW Bass (POSTER) *RFLP Full-Length Insert Sequence (RFLP-FLIS) data for use in the cytogenetic map of maize project.* 50th Annual Maize Genetics Conference; Washington, DC, Feb 27 – Mar 2, **2008**.

KD Beckham*, DM Figueroa, CJ Lawrence, & HW Bass (POSTER) *Bioinformatic Selection of Syntenic Sorghum BACs with Maize Core Bin Markers for use as FISH Probes in the Development of a Cytogenetic Map of Maize*. 50th Annual Maize Genetics Conference; Washington, DC, Feb 27 – Mar 2, **2008**.

AN Brown*, NC Fredette, KA McLaughlin, JA Lorenzen, N Lauter, & HW Bass (POSTER) *Genetic Analysis of Telomere Length Regulation.* 50th Annual Maize Genetics Conference; Washington, DC, Feb 27 – Mar 2, **2008**.

NC Fredette*, AN Brown, & HW Bass (POSTER) *Genetic Analysis of Telomere Length Variation in Maize (*Zea mays*, L.).* Beta Beta Beta 2008 Biennial National Convention; Highland Heights, KY, May 28 – 31, **2008**.

KD Beckham*, DM Figueroa, & HW Bass. (POSTER – 3rd Place, John C. Johnson Award for Excellence in Student Research) *Bioinformatic Selection of Sorghum BACs for use as FISH probes in developing a Cytogenetic Map of Maize.* Beta Beta Beta 2008 Biennial National Convention; Highland Heights, KY, May 28 – 31, **2008**.

DM Figueroa*, KD Beckham, JD Davis, CJ Lawrence, & HW Bass. (POSTER) *Constructing a Cytogenetic Map Of Maize In Oat Addition Lines Using Sorghum BACs As FISH Probes*. 51st Annual Maize Genetics Conference; St. Charles, IL; March 12-15, **2009.**

AN Brown*, N Lauter, KM Large, NC Fredette, EG Lastra, & HW Bass. (POSTER) *Mapping of Telomere Length Regulating Factors.* 51st Annual Maize Genetics Conference; St. Charles, IL; March 12-15, **2009.**

SP Murphy* & HW Bass. (POSTER) *Molecular Analyses of a SUN (Sad1p/Unc-84) Domain-Containing Protein Gene in Maize (Zea mays L), a Candidate for the Desynaptic Gene* 51st Annual Maize Genetics Conference; St. Charles, IL; March 12-15, **2009.**

Professional Society Memberships:

1988 – 1992	The American Society of Plant Physiologists
1988 – 2005	International Society for Plant Molecular Biology
1989 – 1991	The North Carolina Academy of Sciences
1989 –	The Maize Genetics Cooperative
1991 –	The American Society of Cell Biology
1992 –	Sigma Xi, The Scientific Research Society
1998 –	The American Association for the Advancement of Science
1999 –	The American Society of Plant Biologists
2006 –	The Genetics Society of America

TEACHING

Undergraduate Teaching:

General Genetics	PCB3063, typically taught once every year
Plant Molecular Biology,	BOT4394/5938, typically taught once every two years
Directed Individual Study	PCB4931, (D.I.S.), undergraduate lab research, taught each semester, typically 3 students each semester

Graduate Teaching:

Plant Molecular Biology,	BOT5938, (same class as BOT4394)
Advanced Molecular Biol.	PCB5595, taught (50-70%), once per year.
Seminar in Botany	BOT6936, taught (25-33%), typically twice per year.
Seminar in Genetics	PCB6936, taught (50%) once per year, spring semesters.

Undergraduate Supervision:

D.I.S., Directed Individual Study, laboratory or field work
R.E.U., NSF-sponsored Research Experience for Undergraduates

Student Name	**Dates**	**Activities, positions, fellowships (next position)**
Regina P. Murray	1999	D.I.S.
Stefano J. Bordoli	1998 – 2001	Fisher-ACS Fellow, D.I.S., laboratory technician.

		(Medical School)
Rachel A. Santarella	1999 – 2001	Fisher-ACS Fellow, D.I.S., laboratory technician. (Research Technician European Molecular Biology Laboratory – EMBL, Germany)
Kim P. Lindamood	1999	D.I.S. (Veterinary School)
Amy K. Hughes	1999	D.I.S. (Public Science Teacher, FL)
Eric M. Foss	1999 – 2000	D.I.S. (Dental School)
Linda C. Kang	1999 – 2000	D.I.S. (Medical School)
Tace M. Steele	2000 – 2002	D.I.S., Research Fellow, NSF-REU. (Medical School)
Sara J. Noyes	2000 – 2001	D.I.S., Undergraduate Fellow. (Graduate School)
Valerie Hernandez	2000	Work-Study.
Leisa P. Jackson	2000 – 2002	D.I.S., laboratory technician. (Research Technician, Duke Univ.)
Marshawn D. Hay	2000 – 2004	Work Study, Res. Fellow, NSF-REU.
Eric H. Jones	2002 – 2004	Fisher - ACS Fellow Summer 2003, NSF-REU, D.I.S. (Graduate School)
Debbie M. Figueroa	2002 – 2004	D.I.S., NSF-REU. (Graduate School, FSU)
Colette S. Burger	2003	D.I.S. (NIH Laboratory Technician, Medical School)
David St. Jean	2004 – 2009	Field and laboratory technician.
Maria S. Conejo	2004 – 2005	Laboratory technician (Graduate School, FSU)
Cheuk Fu	2005	D.I.S.
Lisa P. Ritchey	2005 – 2007	Laboratory technician, D.I.S. (Graduate School, USF)
Ashley T. Morganti	2006	D.I.S.
James D. Davis	2006 – 2008	D.I.S., lab techn.; NSF-REU. (Graduate School, USF)
Natalie C. Fredette	2006 – 2008	Laboratory technician, D.I.S., FE Fisher Awardee. (Graduate School, U. Maine)
Kate D. Beckham	2006 – 2008	D.I.S., Honors in the Major, NSF-REU, Bess Ward Awardee 2008, FSU 2008 Undergraduate Research and Creative Endeavors (URACE) Summer Awardee 2008
Amy M. Win	2006 – 2008	D.I.S. Field and laboratory technician.
Jason A. Lorenzen	2007 – 2008	Fisher-ACS Fellow – Summer 2007, D.I.S., McCallister Awardee – Spring 2008 (Medical School).
Kari L. Price	2007 – 2009	Office and laboratory assistant; D.I.S.
Eduardo G. Lastra	2008 –	D.I.S., Fisher-ACS Fellow – Summer 2008 (Laboratory technician, Merck)
Genevieve L. Price	2008 –	D.I.S.
Heather Applewhite	2008 –	Field and laboratory technician (Health Educator, AmeriCorps).
Ayesha F. Hussain	2009 –	D.I.S., NSF-REU
Eric J. O'Rear,	2009	D.I.S.
Tabatha M. McHill,	2009 –	D.I.S. (2009-)
Liz S. Howe	2009 –	Biology Major; W.I.M.S.E., Honors in the major (2009-)
Danny L. Vera	2009 –	D.I.S. (2009-)

Master's Students:

George L. Koumbaris, M.S. (2003) in Biological Science
*Development of a New Cytogenetic Mapping Strategy for Maize (*Zea mays *L.); Use of Marker-Selected Sorghum BACs as FISH Probes on Pachytene Chromosome-9 from a Chromosome Addition Line of Oat (*Avena sativa*).*
Current position – Staff Scientist at The Cyprus Institute for Neurology and Genetics, Department of Cytogenetics, CYPRUS.

Xianhui Li, M.S. (2007) in Biological Science (initial advisor: C. Altmann)
Gene expression and regulation in early vertebrate development
http://etd.lib.fsu.edu/theses/available/etd-11082007-101913/

Yolanda R. Bassie, (2002 – present) Molecular cytology of maize repeat sequences
Florida A & M University Student, (Advisor: O. Onokpise)

Joel M. Moore, (2004 – present)
Research area: *Analysis of Maize Telomeric Proteins*

Doctoral Students:

Calin O. Marian, Ph. D. (2005) in Biological Science
Identification of Maize (Zea mays L.) Genes Encoding Telomere Repeat DNA-Binding Proteins. http://etd.lib.fsu.edu/theses/available/etd-07082005-173029/
Current position: Department of Defense Postdoctoral Fellow - Prostate Cancer Training Award, Shay/Wright laboratory; UT Southwestern Medical Center, Dallas, TX, USA

Matthew J. Drum, Ph. D. (2006) in Biological Science (initial advisor Dr. A. D. Johnson)
Expression of Axdazl and Axvh in Axolotl Germ Cells, Suggest that Regulative Germ Cell Specification is a Primitive Trait conserved in the mammalian lineage.
http://etd.lib.fsu.edu/theses/available/etd-04072006-190210/
Current position: Visiting Assistant Professor, Department of Biological Sciences, Florida A & M University, Tallahassee, FL.

F. Ina E. Amarillo, Ph. D. (2007) in Biological Science
Construction and Analysis of a Transgenomic Cytogenetic Sorghum (Sorghum propinquum) BAC FISH Map of Maize (Zea mays L.) Pachytene Chromosome 9.
http://etd.lib.fsu.edu/theses/available/etd-11072007-111615/
Current position: Postdoctoral Researcher at NYU Skirball Institute of Biomolecular Medicine, Dr. Susan Smith laboratory; molecular mechanisms of human telomere function; New York, NY, USA

Amber N. Brown, Ph. D. Candidate (2003 – present)
Research area: *Genetic Control of Maize Telomere Length.*

Debbie M. Figueroa, Ph. D. Candidate (2004 – present)
Research area: *Cytogenetic Map of Maize Core Bin Marker Loci.*

Shaun P. Murphy, Ph. D. Candidate, AHA pre-doctoral Fellow (2005– 2009)
Research area; *Molecular Genetics and Cytology of Maize desynaptic Mutants*.

Graduate Committees, current* or prior:	Bassie, YR	M.S.	Brown, M	Ph.D.
	Beyrouthy, MJ	Ph.D.	Chamberlain, K	Ph.D.

Chattopadhayay, M	M.S.	Kuipers*, M	Ph.D.	Poduch*, K	M.S.
Drum, M	Ph.D.	Kwon, B	Ph.D.	Richards, D	Ph.D.
Gassett, S	Ph.D.	Li, X	Ph.D.	Riman*, S	Ph.D.
Hereford, J	Ph.D.	Liang, B	Ph.D.	Ring, BC	Ph.D.
Hollenseed*, L	Ph.D.	Liu, H	Ph.D.	Rizkallah, R	Ph.D.
Hong*, H	Ph.D.	Lowenberg, M	M.S.	Ryba*, T	Ph.D.
Imber, A	M.S.	Lu*, J	Ph.D.	Santollo*, J	Ph.D.
Jiang, T	M.S.	Masi, T	Ph.D.	Sharkey*, J	Ph.D.
Jones*, EH	Ph.D.	Meng, F	Ph.D.	Sherdan, D	Ph.D.
Kang, Y	Ph.D.	Millsaps*, B	M.S.	Wang*, M	M.S.
Kassardjian*, A	Ph.D.	Moriuchi, K	Ph.D.	Wu, F	Ph.D.
Keegan, J	Ph.D.	Mosko, C	Ph.D.	Yang*, F	Ph.D.
Klusza*, S	Ph.D.	Palko, L	Ph.D.		

Undergraduate Committees, current* or prior:

Gelvin Daube	Honors Thesis	Biochemistry
Laura Griffin	Honors Thesis	Biochemistry
Danielle Swetnam	Honors Thesis	Biomedical Sciences
Michael Damit	Honors Thesis	Biological Science,
Natalia Toledo	Honors Thesis	Biological Science
Kate Beckham	Honors Thesis	Biological Science (major professor)
Liz Howe*	Honors Thesis	Biological Science (major professor)
Shannon Mills*	Honors Thesis	Biological Science
David Mari*	Honors Thesis	Biological Science

Post-Doctoal and Senior Biologist Researchers:

Marion Goltz, Ph.D, 1999 – 2000
Currently: Biotechnology, Germany

Ruth Didier Swofford 2002 – 2003
Currently: Director of Cell Culture,
FSU College of Medicine, Tallahassee, FL, USA

Bobbye J. Hill, 2003 – 2006, project manager, cytogenetic map of maize project

Ring, Brian C., Ph.D. 2004 – 2006, cytogenetic mapping project
Currently: Assistant Professor of Biology,
Valdosta State University, Valdosta, GA, USA

SERVICE – INTRAMURAL

Departmental Service (Biological Science, FSU):

Executive Committee, 1998-1999

Panelist, academic job workshop "Getting a job in academe & Compiling a teaching/research portfolio." Organizer Dr. L Gapp-Levi, Florida State Univ., March 1998.

Mentoring Committee, Dept. Biological Science, Fall 1999

MicroArray Facility Purchase Committee (chair), Biological Science, Spring 2000

Promotion & Tenure Criteria Review Committee; Biological Science, Sumer Fall 2001

CryoEM Search Committee, Fall 2002

Faculty Evaluation Committee, Spring 2002
FSU Representative for the Consortium for Plant Biotechnology Research, Inc.,
Cell & Molecular Biology graduate program area representative 2002-2003
J. Herbert Taylor Professorship Selection Committee 2003 – 2006.
Taylor Search – departmental advisory cabinet, 2003 – 2006.
Faculty Evaluation Committee, Spring 2004
Executive Committee, Dept. Biological Science, 2004-2005
Cell Molecular Biology (CMB) Faculty Search Committee, 2005-2006
Biological Science Chair Selection Committee, Fall 2005
Cluster Hire Genotype Phenotype (IGP) Action Committee, 2006 – 2007.
Faculty Retreat on Undergraduate Curriculum Planning Committee, Spring 2006.
Executive Committee, 2006-2007.
IGP Cluster Hire, Core & Search Committee, 2006 – 2009
First Year Advisory Committee, CMB graduate program, 2008-2009
First Year Advisory Committee (Chair), CMB graduate program, 2009-2010

University Service (Florida State University)
Faculty Search Committee, Biomedical Sciences Dept., Fall 2005.
University Biosafety Committee, 2006 –
Computer and Information Resources Committee, 2006-2009
Rodger's Chair Search Committee, Biomedical Sciences Dept., 2006 – 2007.

SERVICE – EXTRAMURAL

PEER REVIEW

Manuscripts (ad hoc peer review): (average ~ 5-10 manuscripts total per year).
Journals: *BioTechniques, Chromosoma, Genetics, Genome, Genome Research, Hereditas*, *Journal of Cell Science, Maydica, Plant and Cell Physiology, Plant Cell, Plant Breeding Reviews, Plant Journal, Plant Science, Science, Theoretical and Applied Genetics, Journal of Experimental Botany*

Textbooks: (average ~ 0.5 books or book sections total per year).
Prentice Hall, *John Wiley & sons, Inc*.

Grant Proposal ad hoc reviews: (~ 5-10 grant proposals per year)
NSF, USDA

Letters of Evaluation for Promotion and Tenure
2006, 2008

FEDERAL GRANT PANEL

USDA, Plant Genetic Mechanisms; Spring 2005, 2006, 2007.

MEETING WORKSHOP ORGANIZER

Co-organizer for International Plant and Animal Genome Conference Workshop ('06-08) PAG XIV, Plant Cytogenetics Workshop, Jan 2006, San Diego, CA

EDITOR

Journal

Guest Editor for Multi-Author Review series on Telomeres, 5 reviews in the November 2003 issue of *Cellular and Molecular Life Sciences*.

Textbooks

Plant Cytogenetics: Genome Structure and Chromosome Function
Eds. H.W. Bass and J.A. Birchler; Springer, (due out in 2009).
In *Plant Genetics and Genomics: Crops and Models* (Series editor R.A. Jorgensen)

Plant Cytogenetics: Methods and Instruction
Eds. H.W. Bass and J.A. Birchler; Springer, (due out in 2009).
In *Plant Genetics and Genomics: Crops and Models* (Series editor R.A. Jorgensen)

Chapter 9. Chromosomes. (invited author)
Eds. *JE Krebs, ES Goldstein, and ST Kilpatrick*
Jones and Bartlett Publishers (due out in 2009, copyright – 2011)

Other Extramural Service:

WWW-distributed educational resources for teachers & students:

WWW site:	Content:
http://bio.fsu.edu/~bass/images2.html	DAPI images meiotic prophase nuclei
http://bio.fsu.edu/~bass/mv/bq2/bq2-om9-JCS00.html	The "spinners" (spinning projections); supplemental 3D images, meiotic nuclei
http://bio.fsu.edu/~bass/mv/tgmv/	Supplemental movies, intranuclear localization of geminivirus DNA by FISH
http://bio.fsu.edu/~bass/mv/bq3/	3D images meiotic mutant nuclei of maize
http://www.maizegdb.org/cgi-bin/displaymaprecord.cgi?id=892372	Cytogenetic Map of Maize - Data (co-developed with CJ Lawrence, MaizeGDB)
http://www.cytomaize.org/ http://www.cytomaize.org/outreach/ http://www.cytomaize.org/outreach/MaizePics/ZmChrom-1/ZmChrom-1.html	Cytogenetic Map of Maize, Outreach, (mutant photo gallery, middle school, etc)