

References

- Adams RLP. 1995. Eukaryotic DNA methyltransferases - structure and function. *BioEssays* 17: 139-45.
- Adams RLP, Pradhan S, Johnson CA, Lindsay H, Shek EWL, Jenkins GI, and Urwin NAR. 1996. Plant methyltransferases and their targets in the plant genome. *Epigenetic mechanisms of gene regulation*. Russo VEA, Martienssen RA, and Riggs AD ed., pp.95-108. Plainview, NY: Cold Spring Harbor Laboratory Press.
- Alonso-Blanco C, El-Assal SE, Coupland G, and Koornneef M. 1998. Analysis of natural allelic variation at flowering time loci in the Landsberg *erecta* and Cape Verde Islands ecotypes of *Arabidopsis thaliana*. *Genetics* 149: 749-64.
- Alvarez J, Guli CL, Yu XH, and Smyth DR. 1992. *TERMINAL FLOWER*: a gene affecting inflorescence development in *Arabidopsis thaliana*. *Plant Journal* 2: 103-16.
- Aniello F, Locascio A, Fucci L, Geraci G, and Branno M. 1996. Isolation of cDNA clones encoding DNA methyltransferase of sea urchin *P. lividus*: expression during embryonic development. *Gene* 178: 57-61.
- Antequera F, and Bird AP. 1988. Unmethylated CpG islands associated with genes in higher plant DNA. *EMBO Journal* 7: 2295-99.
- Araki T, Kobayashi Y, Kaya H, and Iwabuchi M. 1998. The flowering-time gene *FT* and regulation of flowering in *Arabidopsis*. *Journal of Plant Research* 111: 277-81.
- Araujo FD, Knox JD, Szyf M, Price GB, and Zannishadjopoulos M. 1998. Concurrent replication and methylation at mammalian origins of replication. *Molecular and Cellular Biology* 18: 3475-82.
- Aukerman MJ, Lee I, Weigel D, and Amasino RM. 1999. The *Arabidopsis* flowering-time gene *LUMINIDEPENDENS* is expressed primarily in regions of cell proliferation and encodes a nuclear protein that regulates *LEAFY* expression. *Plant Journal* 18: 195-203.
- Bagnall DJ. 1992. Control of flowering in *Arabidopsis thaliana* by light, vernalisation and gibberellins. *Australian Journal of Plant Physiology* 19: 401-9.
- Bagnall DJ. 1993. Light quality and vernalization interact in controlling late flowering in *Arabidopsis* ecotypes and mutants. *Annals of Botany* 71: 75-83.
- Balganesh TS, Reiners L, Lauster R, Noyer-Weidner M, Wilke K, and Trautner TA. 1987. Construction and use of chimeric SPR/phi 3T DNA methyltransferases in the definition of sequence recognizing enzyme regions. *EMBO Journal* 6: 3543-49.
- Bancroft I, Jones JDG, and Dean C. 1993. Heterologous transposon tagging of the *DRL1* locus in *Arabidopsis*. *Plant Cell* 5: 631-38.

- Banks JA, and Fedoroff N. 1989. Patterns of developmental and heritable change in methylation of the *Suppressor-mutator* transposable element. *Developmental Genetics* 10: 425-37.
- Barendse GWM, Kepczynski J, Karssen CM, and Koornneef M. 1986. The role of endogenous gibberellins during fruit and seed development: Studies on gibberellin-deficient genotypes of *Arabidopsis thaliana*. *Physiologia Plantarum* 67: 315-19.
- Barry C, Faugeron G, and Rossignol JL. 1993. Methylation induced premeiotically in *Ascomolus*: coextension with DNA repeat lengths and effect on transcript elongation. *Proceedings of the National Academy of Sciences of the U.S.A.* 90: 4557-61.
- Beard C, Li E, and Jaenisch R. 1995. Loss of methylation activates Xist in somatic but not in embryonic cells. *Genes and Development* 9: 2325-34.
- Bechtold N, Ellis J, and Pelletier G. 1993. *In planta Agrobacterium* mediated gene transfer by infiltration of adult *Arabidopsis thaliana* plants. *C.R. Academy Science* 316: 1194-99.
- Bell CJ, and Ecker JR. 1994. Assignment of 30 microsatellite loci to the linkage map of *Arabidopsis*. *Genomics* 19: 137-44.
- Bender J. 1998. Cytosine methylation of repeated sequences in eukaryotes: the role of DNA pairing. *Trends in Biochemical Science* 23: 252-56.
- Bender J, and Fink GR. 1995. Epigenetic control of an endogenous gene family is revealed by a novel blue fluorescent mutant of *Arabidopsis*. *Cell* 83: 725-34.
- Bennetzen JL, Schrick K, Springer PS, Brown WE, and San Miguel P. 1994. Active maize genes are unmodified and flanked by diverse classes of modified, highly repetitive DNA. *Genome* 37: 565-76.
- Bernacchia G, Para A, Pedrali-Noy G, and Cella R. 1998. Isolation of a cDNA coding for DNA (Cytosine-5)-methyltransferase (Accession No. AJ002140) from *Lycopersicon esculentum*. *Plant Physiology* 116: 446.
- Bernacchia G, Primo A, Giorgetti L, Pitto L, and Cella R. 1998. Carrot DNA-methyltransferase is encoded by two classes of genes with differing patterns of expression. *Plant Journal* 13: 317-29.
- Bestor T, Laudano A, Mattaliano R, and Ingram V. 1988. Cloning and sequencing of a cDNA encoding DNA methyltransferase of mouse cells. The carboxyl-terminal domain of the mammalian enzymes is related to bacterial restriction methyltransferases. *Journal of Molecular Biology* 203: 971-83.
- Bestor TH. 1992. Activation of mammalian DNA methyltransferase by cleavage of a Zn binding regulatory domain. *EMBO Journal* 11: 2611-7 .

- Bestor TH, and Ingram VM. 1983. Two DNA methyltransferases from murine erythroleukemia cells: Purification, sequence specificity, and mode of interaction with DNA. *Proceedings of the National Academy of Sciences of the U.S.A.* 80: 5559-63.
- Bestor TH, and Verdine GL. 1994. DNA methyltransferases. *Current Opinion in Cell Biology* 6: 380-389.
- Bhattacharya SK, Ramchandani S, Cervoni N, and Szyf M. 1999. A mammalian protein with specific demethylase activity for mCpG DNA. *Nature* 397: 579-83.
- Billen D. 1968. Methylation of the bacterial chromosome: an event at the "replication point"? *Journal of Molecular Biology* 31: 477-86.
- Bilodeau P, Udvardi MK, Peacock WJ, and Dennis ES. 1999. A prolonged cold treatment-induced cytochrome P450 gene from *Arabidopsis thaliana*. *Plant Cell and Environment* 22: 791-800.
- Birchler JA. 1979. A study of enzyme activities in a dosage series of the long arm of chromosome one in maize. *Genetics* 92: 1211-29.
- Bird AP. 1987. CpG islands as gene markers in the vertebrate nucleus. *Trends in Genetics* 3: 342-47.
- Blazquez MA, Green R, Nilsson O, Sussman MR, and Weigel D. 1998. Gibberellins promote flowering of *Arabidopsis* by activating the *LEAFY* promoter. *Plant Cell* 10: 791-800.
- Blazquez MA, Soowal LN, Lee I, and Weigel D. 1997. *LEAFY* expression and flower initiation in *Arabidopsis*. *Development* 124: 3835-44.
- Bradley D, Ratcliffe O, Vincent C, Carpenter R, and Coen E. 1997. Inflorescence commitment and architecture in *Arabidopsis*. *Science* 275: 80-83.
- Brenton JD, Viville S, and Surani MA. 1995. Genomic imprinting and cancer. *Cancer Surveys* 25: 161-71.
- Brock RD, and Davidson JL. 1994. 5-Azacytidine and gamma rays partially substitute for cold treatment in vernalizing winter wheat. *Environmental and Experimental Botany* 34: 195-99.
- Brown JWS. 1986. A catalogue of splice junction and putative branch point sequences from plant introns. *Nucleic Acids Research* 14: 9549-59.
- Burn JE, Bagnall DJ, Metzger JD, Dennis ES, and Peacock WJ. 1993. DNA methylation, vernalization, and the initiation of flowering. *Proceedings of the National Academy of Sciences of the United States of America* 90: 287-91.

- Burn JE, Smyth DR, Peacock WJ, and Dennis ES. 1993. Genes conferring late flowering in *Arabidopsis thaliana*. *Genetica* 90: 147-55.
- Cambareri EB, Jensen BC, Schabtach E, and Selker EU. 1989. Repeat-induced G-C to A-T mutations in *Neurospora*. *Science* 244: 1571-75.
- Cavalli G, and Paro R. 1998. Chromo-domain proteins: linking chromatin structure to epigenetic regulation. *Current Opinion in Cell Biology* 10: 354-60.
- Cedar H. 1988. DNA methylation and gene activity. *Cell* 53: 3-4.
- Chandler J, and Dean C. 1994. Factors influencing the vernalization response and flowering time of late flowering mutants of *Arabidopsis thaliana* (L.) Heynh. *Journal of Experimental Botany* 45: 1279-88.
- Chandler J, Wilson A, and Dean C. 1996. *Arabidopsis* mutants showing an altered response to vernalization. *Plant Journal* 10: 637-44.
- Chang C, and Meyerowitz EM. 1986. Molecular cloning and DNA sequence of the *Arabidopsis thaliana* alcohol dehydrogenase gene. *Proceedings of the National Academy of Sciences of the U.S.A.* 83: 1408-12.
- Chaudhuri S, and Messing J. 1994. Allele-specific parental imprinting of *dzr1*, a post-transcriptional regulator of zein accumulation. *Proceedings of the National Academy of Sciences of the U.S.A.* 91: 4867-71.
- Chaudhury AM, Luo M, Miller C, Craig S, Dennis ES, and Peacock WJ. 1997. Fertilization-independent seed development in *Arabidopsis thaliana*. *Proceedings of the National Academy of Sciences of the U.S.A.* 94: 4223-28.
- Chen L, Cheng J-C, Castle L, and Sung ZR. 1997. *EMF* genes regulate *Arabidopsis* inflorescence development. *Plant Cell* 9: 2011-24.
- Chen L, MacMillan AM, Chang W, Ezaz-Nikpay K, Lane WS, and Verdine GL. 1991. Direct identification of the active-site nucleophile in a DNA (cytosine-5)-methyltransferase. *Biochemistry* 30: 11018-25.
- Cheng X, Kumar S, Posfai J, Pflugrath, and Roberts RJ. 1993. Crystal structure of the HhaI DNA methyltransferase complexed with S-adenosyl-L-methionine. *Cell* 74.
- Chernov AV, Vollmayr P, Walter J, and Trautner TA. 1997. Msc2, a C5-DNA-methyltransferase from *Ascobolus immersus* with similarity to methyltransferases of higher organisms. *Biological Chemistry* 378: 1467-73.
- Churchill MEA, and Suzuki M. 1989. 'SPKK' motifs prefer to bind to DNA at A/T-rich sites. *EMBO Journal* 8: 4189-95.

- Clark SJ, Harrison J, and Frommer M. 1995. CpNpG methylation in mammalian cells. *Nature Genetics* 10: 20-27.
- Clark SJ, Harrison J, Paul CL, and Frommer M. 1994. High sensitivity mapping of methylated cytosines. *Nucleic Acids Research* 22: 2990-2997.
- Clarke JH, and Dean C. 1994. Mapping *FRI*, a locus controlling flowering time and vernalization response in *Arabidopsis thaliana*. *Molecular and General Genetics* 242: 81-89.
- Clarke JH, Mithen R, Brown JKM, and Dean C. 1995. QTL analysis of flowering time in *Arabidopsis thaliana*. *Molecular and General Genetics* 248: 278-86.
- Conner JA, Tantikanjana T, Stein JC, Kandasamy MK, Nasrallah JB, and Nasrallah ME. 1997. Transgene-induced silencing of S-locus genes and related genes in Brassica. *Plant Journal* 11: 809-23.
- Crozier A. 1983. *The Biochemistry and Physiology of Gibberellins*. New York: Praeger.
- D'Alessio JM, Bebee R, Hartley JL, Noon MC, and Polayes D. 1992. Lambda ZipLoxTM: Automatic subcloning of cDNA. *Focus* 14: 76-79.
- Dellaporta SL, Wood J, and Hicks JB. 1983. Maize DNA minipreps. *Maize Genetics Cooperation News Letter*: 26-29.
- Deng J, and Szyf M. 1998. Multiple isoforms of DNA methyltransferase are encoded by the vertebrate cytosine DNA methyltransferase gene. *Journal of Biological Chemistry* 273: 22869-72.
- Dennis ES, Finnegan EJ, Bilodeau P, Chaudhury A, Genger R, Helliwell CA, Sheldon CC, Bagnall DJ, and Peacock WJ. 1996. Vernalization and the initiation of flowering. *Seminars in Cell and Developmental Biology* 7: 441-48.
- Dieguez MJ, Vaucheret H, Paszkowski J, and Scheid OM. 1998. Cytosine methylation at CG and CNG sites is not a prerequisite for the initiation of transcriptional gene silencing in plants, but it is required for its maintenance. *Molecular and General Genetics* 259: 207-15.
- Dolferus R, Van den Bossche D, and Jacobs M. 1990. Sequence analysis of two null-mutant alleles of the single *Arabidopsis Adh* locus. *Molecular and General Genetics* 224: 297-302.
- Dougherty WG, and Parks TD. 1995. Transgenes and gene suppression: telling us something new? *Current Opinion in Cell Biology* 7: 399-405.
- Eden S, and Cedar H. 1994. Role of DNA methylation in the regulation of transcription. *Current Opinion in Genetics and Development* 4: 255-59.

- Edwards K, Johnstone C, and Thompson C. 1991. A simple and rapid method for the preparation of plant genomic DNA for PCR analysis. *Nucleic Acids Research* 19: 1349.
- Eggleston WB, Alleman M, and Kermicle JL. 1995. Molecular organization and germinal instability of *R-stippled* maize. *Genetics* 141: 347-60.
- Elledge SJ, Mulligan JT, Ramer SW, Spottswood M, and Davis RW. 1991. λ YES: A multifunctional cDNA expression vector for the isolation of genes by complementation of yeast and *Escherichia coli* mutations. *Proceedings of the National Academy of Sciences of the U.S.A.* 88: 1731-35.
- Elmayan T, Balzergue S, Beon F, Bourdon V, Daubremet J, Guenet Y, Mourrain P, Palauqui JC, Vernhettes S, Vialle T, Wostrikoff K, and Vaucheret H. 1998. Arabidopsis mutants impaired in cosuppression. *Plant Cell* 10: 747-1757.
- Elmayan T, and Vaucheret H. 1996. Expression of single copies of a strongly expressed 35S transgene can be silenced post-transcriptionally. *Plant Journal* 9: 787-97.
- Engels WR. 1997. Invasions of P elements. *Genetics* 145: 11-15.
- English JJ, Mueller E, and Baulcombe DC. 1996. Suppression of virus accumulation in transgenic plants exhibiting silencing of nuclear genes. *Plant Cell* 8: 179-88.
- Ergle DR, and Katterman FRH. 1961. Deoxyribonucleic acid of cotton. *Plant Physiology* 36: 811-15.
- Eskins K. 1992. Light-quality effects on Arabidopsis development. Red, blue and far-red regulation of flowering and morphology. *Physiologia Plantarum* 86: 439-44.
- Fedoroff N, Schlappi M, and Raina R. 1995. Epigenetic regulation of the maize *Spm* transposon. *BioEssays* 17: 91-297.
- Fedoroff NV. 1989. About maize transposable elements and development. *Cell* 56: 81-191.
- Fedoroff NV. 1999. The suppressor-mutator element and the evolutionary riddle of transposons. *Genes to Cells* 4: 11-19.
- Finnegan DJ. 1985. Transposable elements in eukaryotes. *International Review of Cytology* 93: 281-326.
- Finnegan EJ, and Dennis ES. 1993. Isolation and identification by sequence homology of a putative cytosine methyltransferase from *Arabidopsis thaliana*. *Nucleic Acids Research* 21: 2383-88.
- Finnegan EJ, Genger RK, Kovac K, Peacock WJ, and Dennis ES. 1998b. DNA methylation and the promotion of flowering by vernalization. *Proceedings of the National Academy of Sciences of the U.S.A.* 95: 5824-29.

- Finnegan, EJ, RK Genger, WJ Peacock, and ES Dennis. 1998a. DNA methylation in plants. *Annual Review of Plant Physiology and Plant Molecular Biology* 49: 223-47.
- Finnegan EJ, and Kovac K. 2000. Plant DNA methyltransferases. *Plant Molecular Biology* in press.
- Finnegan EJ, Peacock WJ, and Dennis ES. 1996. Reduced DNA methylation in *Arabidopsis thaliana* results in abnormal plant development. *Proceedings of the National Academy of Sciences of the U.S.A.* 93: 8449-54.
- Flavell RB. 1994. Inactivation of gene expression in plants as a consequence of specific sequence duplication. *Proceedings of the National Academy of Sciences of the United States of America* 91: 3490-3496.
- Foss HM, Roberts CJ, and Selker EU. 1998. Mutations in the *DIM-1* gene of *Neurospora crassa* reduce the level of DNA methylation. *Molecular and General Genetics* 259: 60-71.
- Fowler S, Lee K, Onouchi H, Samach A, Richardson K, Coupland G, and Putterill J. 1999. GIGANTEA: a circadian clock-controlled gene that regulates photoperiodic flowering in *Arabidopsis* and encodes a protein with several possible membrane-spanning domains. *EMBO JOURNAL* 18: 4679-88.
- Freedman T, and Pukkila PJ. 1993. *De novo* methylation of repeated sequences in *Coprinus cinereus*. *Genetics* 135: 357-66.
- Fremont M, Siegmann M, Gaulis S, Matthies R, Hess D, and Jost JP. 1997. Demethylation of DNA by purified chick embryo 5-methylcytosine-DNA glycosylase requires both protein and RNA. *Nucleic Acids Research* 25: 2375-80.
- Frommer M, McDonald LE, Millar DS, Collis CM, Watt F, Grigg GW, Molloy PL, and Paul CL. 1992. A genomic sequencing protocol that yields a positive display of 5-methylcytosine residues in individual DNA strands. *Proceedings of the National Academy of Sciences of the U.S.A.* 89: 1827-31.
- Furner IJ, Sheikh MA, and Collett CE. 1998. Gene silencing and homology-dependent gene silencing in *Arabidopsis* - genetic modifiers and DNA methylation. *Genetics* 149: 651-62.
- Garcia-Bustos J, Heitman J, and Hall MN. 1991. Nuclear protein localization. *Biochimica Et Biophysica Acta* 1071: 83-101.
- Gendall, T, P Dijkwel, U Johanson, Y Levy, C Lister, G Simpson, P Sivadon, K Tornet, and C Dean. 1999. Vernalization in *Arabidopsis* - a molecular genetic approach. *Tenth International Conference of Arabidopsis Research*.
- Genger RK, Kovac KA, Dennis ES, Peacock WJ, and Finnegan EJ. 1999. Multiple DNA methyltransferase genes in *Arabidopsis thaliana*. *Plant Molecular Biology* 41: 269-78.

- Gilmour SJ, Zeevaart JAD, Schwenen L, and Graebe JE. 1986. Gibberellin metabolism in cell-free extracts from spinach leaves in relation to photoperiod. *Plant Physiology* 82: 190-195.
- Goodrich J, Puangsomlee P, Martin M, Long D, Meyerowitz EM, and Coupland G. 1997. A Polycomb-group gene regulates homeotic gene expression in Arabidopsis. *Nature* 386: 44-51.
- Goubely C, Arnaud P, Tatout C, Heslop-Harrison JS, and Deragon JM. 1999. S1 SINE retroposons are methylated at symmetrical and non-symmetrical positions in *Brassica napus*: identification of a preferred target site for asymmetrical methylation. *Plant Molecular Biology* 39: 243-55.
- Goyon C. 1998. Isolation and identification by sequence homology of a second putative C5-DNA-methyltransferase gene from *Ascobolus immersus*. *DNA Sequence* 9: 109-12.
- Goyon C, and Faugeron G. 1989. Targeted transformation of *Ascobolus immersus* and de novo methylation of the resulting duplicated DNA sequences. *Molecular and Cellular Biology* 9: 2818-27.
- Grbic B, and Bleecker AB. 1996. An altered body plan is conferred on Arabidopsis plants carrying dominant alleles of two genes. *Development* 122: 2395-403.
- Green RM, and Tobin EM. 1999. Loss of the circadian clock-associated protein 1 in Arabidopsis results in altered clock-regulated gene expression. *Proceedings of the National Academy of Sciences of the U.S.A.* 96: 4176-79.
- Gregory PD, and Hörz W. 1998. Life with nucleosomes: chromatin remodelling in gene regulation. *Current Opinion in Cell Biology* 10: 339-45.
- Grossniklaus U, Vielle-Calzada JP, Hoepfner MA, and Gagliano WB. 1998. Maternal control of embryogenesis by *MEDEA*, a polycomb group gene in Arabidopsis. *Science* 280: 446-50.
- Gruenbaum Y, Naveh-Many T, Cedar H, and Razin A. 1981. Sequence specificity of methylation in higher plant DNA. *Nature* 292: 860-862.
- Guo, HW, WY Yang, TC Mockler, and CT Lin. 1998. Regulation of flowering time by Arabidopsis photoreceptors. *Science* 279: 1360-1363.
- Guseinov VA, Kiryanov GI, and Vanyushin BF. 1975. Intragenome distribution of 5-methylcytosine in DNA of healthy and wilt-infected cotton plants (*Gossypium hirsutum* L.). *Molecular Biology Reports* 2: 59-63.
- Hamilton AJ, Brown S, Han YuanHai, Ishizuka M, Lowe A, Solis AGA, Grierson D, and Han YH. 1998. A transgene with repeated DNA causes high frequency, post-transcriptional suppression of ACC-oxidase gene expression in tomato. *Plant Journal* 15: 737-46.

- Harbers K, Schnieke A, Stuhlmann H, Jahner D, and Jaenisch R. 1981. DNA methylation and gene expression: endogenous retroviral genome becomes infectious after molecular cloning. *Proceedings of the National Academy of Sciences of the U.S.A.* 78: 7609-13.
- Haughn GW, and Somerville CR. 1986. Sulfonurea-resistant mutants of *Arabidopsis thaliana*. *Molecular and General Genetics* 204: 430-434.
- Haung MD, and Yang CH. 1998. EMF genes interact with late-flowering genes to regulate Arabidopsis shoot development. *Plant and Cell Physiology* 39: 382-93.
- Hazebroek JP, and Metzger JD. 1990. Thermoinductive regulation of gibberellin metabolism in *Thlaspi arvense* L. *Plant Physiology* 94: 157-65.
- Hazebroek JP, Metzger JD, and Mansager ER. 1993. Thermoinductive regulation of gibberellin metabolism in *Thlaspi arvense* L. II. Cold induction of enzymes in gibberellin biosynthesis. *Plant Physiology* 102: 547-52.
- Henikoff S, and Comai L. 1998. A DNA methyltransferase homolog with a chromodomain exists in multiple polymorphic forms in Arabidopsis. *Genetics* 149: 307-18.
- Hicks KA, Millar AJ, Carre IA, Somers DE, Straume M, Meeks-Wagner DR, and Kay SA. 1996. Conditional circadian dysfunction of the Arabidopsis early-flowering 3 mutant. *Science* 274: 790-792.
- Holliday R, and Pugh JE. 1975. DNA modification mechanisms and gene activity during development. *Science* 187: 226-32.
- Hung MS, Karthikeyan N, Huang BL, Koo HC, Kiger J, and Shen CKJ. 1999. Drosophila proteins related to vertebrate DNA (5-cytosine) methyltransferases. *Proceedings of the National Academy of Sciences of the U.S.A.* 96: 11940-11945.
- Iglesias VA, Moscone EA, Papp I, Neuhuber F, Michalowski S, Phelan T, Spiker S, Matzke M, and Matzke AJ. 1997. Molecular and cytogenetic analyses of stably and unstably expressed transgene loci in tobacco. *Plant Cell* 9: 1251-64.
- Ingrosso D, Fowler AV, Bleibaum J, and Clarke S. 1989. Sequence of the D-aspartyl/L-isoaspartyl protein methyltransferase from human erythrocytes. *Journal of Biological Chemistry* 264: 20130-20139.
- Irish VF. 1998. Floral development in Arabidopsis. *Plant Physiology and Biochemistry* 36: 61-68.
- Jacobsen SE, and Meyerowitz EM. 1997. Hypermethylated *SUPERMAN* epigenetic alleles in Arabidopsis. *Science* 277: 1100-1103.
- Jacobsen SE, and Olszewski NE. 1993. Mutations at the SPINDLY locus of Arabidopsis alter gibberellin signal transduction. *Plant Cell* 5: 887-96.

- Jacobsen SE, Sakai H, Finnegan EJ, Cao X, and Meyerowitz EM. 2000. Ectopic hypermethylation of flower-specific genes in Arabidopsis. *Current Biology* 10: 179-86.
- Jaenisch R. 1997. DNA methylation and imprinting: why bother? *Trends in Genetics* 13: 323-29.
- Jakowitsch J, Papp I, Moscone EA, van der Winden J, Matzke M, and Matzke AJ. 1999. Molecular and cytogenetic characterization of a transgene locus that induces silencing and methylation of homologous promoters in *trans*. *Plant Journal* 17: 131-40.
- Jansen RC, Ooijen JWvan, Stam P, Lister C, Dean C, and Van Ooijen JW. 1995. Genotype-by-environment interaction in genetic mapping of multiple quantitative trait loci. *Theoretical and Applied Genetics* 91: 33-37.
- Jeddeloh JA, Bender J, and Richards EJ. 1998. The DNA methylation locus *DDMI* is required for maintenance of gene silencing in *Arabidopsis*. *Genes and Development* 12: 1714-25.
- Jeddeloh JA, Stokes TL, and Richards EJ. 1999. Maintenance of genomic methylation requires a SW12/SNF2-like protein. *Nature Genetics* 22: 94-97.
- Jones AL, Thomas CL, and Maule AJ. 1998. *De novo* methylation and co-suppression induced by a cytoplasmically replicating plant RNA virus. *EMBO Journal* 17: 6385-93.
- Jones PA. 1985. Altering gene expression with 5-azacytidine. *Cell* 40: 485-86.
- Jones PL, Veenstra GJC, Wade PA, Vermaak D, Kass SU, Landsberger N, Strouboulis J, and Wolffe AP. 1998. Methylated DNA and MeCP2 recruit histone deacetylase to repress transcription. *Nature Genetics* 19: 187-91.
- Jost JP. 1993. Nuclear extracts of chicken embryos promote an active demethylation of DNA by excision repair of 5-methyldeoxycytidine. *Proceedings of the National Academy of Sciences of the U.S.A.* 90: 4684-88.
- Jost JP, Fremont M, Siegmann M, and Hofsteenge J. 1997. The RNA moiety of chick embryo 5-methylcytosine- DNA glycosylase targets DNA demethylation. *Nucleic Acids Research* 25: 4545-50.
- Jost JP, Siegmann M, Sun L, and Leung R. 1995. Mechanisms of DNA demethylation in chicken embryos. Purification and properties of a 5-methylcytosine-DNA glycosylase. *Journal of Biological Chemistry* 270: 9734-39.
- Jost JP, Siegmann M, Thiry S, Jost YC, Benjamin D, and Schwarz S. 1999. A re-investigation of the ribonuclease sensitivity of a DNA demethylation reaction in chicken embryo and G8 mouse myoblasts. *FEBS Letters* 449: 251-54.

- Kafri T, Ariel M, Brandeis M, Shemer R, Urven L, McCarrey J, Cedar H, and Razin A. 1992. Developmental pattern of gene-specific DNA methylation in the mouse embryo and germ line. *Genes and Development* 6: 705-14.
- Kakutani T. 1997. Genetic characterization of late-flowering traits induced by DNA hypomethylation mutation in *Arabidopsis thaliana*. *Plant Journal* 12: 1447-51.
- Kakutani T, Jeddelloh JA, Flowers SK, Munakata K, and Richards EJ. 1996. Developmental abnormalities and epimutations associated with DNA hypomethylation mutations. *Proceedings of the National Academy of Sciences of the United States of America* 93: 12406-11.
- Kakutani T, Jeddelloh JA, and Richards EJ. 1995. Characterization of an *Arabidopsis thaliana* DNA hypomethylation mutant. *Nucleic Acids Research* 23: 130-137.
- Kakutani T, Munakata K, Richards EJ, and Hirochika H. 1999. Meiotically and mitotically stable inheritance of DNA hypomethylation induced by *ddm1* mutation of *Arabidopsis thaliana*. *Genetics* 151: 831-38.
- Karlsson BH, Sills GR, and Nienhuis J. 1993. Effects of photoperiod and vernalization on the number of leaves at flowering in 32 *Arabidopsis thaliana* (Brassicaceae) ecotypes. *American Journal of Botany* 80: 646-48.
- Karreman C, and Waard A. 1990. *Agmenellum quadruplicatum* M.AquI, a novel modification methylase. *Journal of Bacteriology* 172: 266-72.
- Kermicle J. 1970. Dependence of the *R* mottled phenotype on the mode of sexual transmission. *Genetics* 66: 69-85.
- Kermicle J. 1996. Epigenetic silencing and activation of a maize *r* gene. *Epigenetic Mechanisms of Gene Regulation*. Russo VEA, Martienssen RA, and Riggs AD ed., pp.267-87. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press.
- Kimura H, Ishihara G, and Tajima S. 1996. Isolation and expression of a *Xenopus laevis* DNA methyltransferase cDNA. *Journal of Biochemistry* 120: 1182-89.
- Kinoshita T, Yadegari R, Harada JJ, Goldberg RB, and Fischer RL. 1999. Imprinting of the *MEDEA* polycomb gene in the *Arabidopsis* endosperm. *Plant Cell* 11: 1945-52.
- Kiyosue T, Ohad N, Yadegari R, Hannon M, Dinneny J, Wells D, Katz A, Margossian L, Harada JJ, Goldberg RB, and Fischer RL. 1999. Control of fertilization-independent endosperm development by the *MEDEA* polycomb gene in *Arabidopsis*. *Proceedings of the National Academy of Sciences of the U.S.A.* 96: 4186-91.
- Klimasauskas S, Kumar S, Roberts RJ, and Cheng X. 1994. HhaI methyltransferase flips its target base out of the DNA helix. *Cell* 76: 357-69.

- Klimasauskas S, Nelson JL, and Roberts RJ. 1991. The sequence specificity domain of cytosine-C5 methylases. *Nucleic Acids Research* 19: 6183-90.
- Klimasauskas S, Szperski T, Serva S, and Wüthrich K. 1998. Dynamic modes of the flipped-out cytosine during *HhaI* methyltransferase-DNA interactions in solution. *EMBO Journal* 17: 317-24.
- Klimyuk VI, Carroll BJ, Thomas CM, and Jones JDG. 1993. Alkali treatment for rapid preparation of plant material for reliable PCR analysis. *Plant Journal* 3: 493-94.
- Konieczny A, and Ausubel FM. 1993. A procedure for mapping *Arabidopsis* mutations using co-dominant ecotype-specific PCR-based markers. *Plant Journal* 4: 403-10.
- Koonin EV, Zhou S, and Lucchesi JC. 1995. The chromo superfamily: new members, duplication of the chromo domain and possible role in delivering transcription regulators to chromatin. *Nucleic Acids Research* 23: 4229-33.
- Koornneef M, Alonso-Blanco C, Blankestijndevries H, Hanhart CJ, and Peeters AJM. 1998. Genetic interactions among late-flowering mutants of *Arabidopsis*. *Genetics* 148: 885-92.
- Koornneef M, Alonso-Blanco C, Peeters AJM, and Soppe W. 1998. Genetic control of flowering time in *Arabidopsis*. *Annual Review of Plant Physiology and Plant Molecular Biology* 49: 345-70.
- Koornneef M, Blankestijn-de Vries H, Hanhart C, Soppe W, and Peeters T. 1994. The phenotype of some late-flowering mutants is enhanced by a locus on chromosome 5 that is not effective in the Landsberg *erecta* wildtype. *Plant Journal* 6: 911-19.
- Koornneef M, Hanhart C, van Loenen-Martinet P, and Blankestijn-de Vries H. 1995. The effect of daylength on the transition to flowering in phytochrome-deficient, late-flowering and double mutants of *Arabidopsis thaliana*. *Physiologia Plantarum* 95.
- Koornneef M, Hanhart CJ, and van der Veen JH. 1991. A genetic and physiological analysis of late flowering mutants in *Arabidopsis thaliana*. *Molecular and General Genetics* 229: 57-66.
- Kooter JM, Matzke MA, and Meyer P. 1999. Listening to the silent genes: transgene silencing, gene regulation and pathogen control. *Trends in Plant Science* 4: 340-347.
- Kowalski SP, Lan TH, Feldmann KA, and Paterson AH. 1994. QTL mapping of naturally-occurring variation in flowering time of *Arabidopsis thaliana*. *Molecular and General Genetics* 245: 548-55.
- Kozak M. 1986. Point mutations define a sequence flanking the AUG initiator codon that modulates translation by eukaryotic ribosomes. *Cell* 44: 283-92.

- Kumar S, Cheng X, Klimasauskas S, Mi S, Posfai J, Roberts RJ, and Wilson GG. 1994. The DNA (cytosine-5) methyltransferases. *Nucleic Acids Research* 22: 1-10.
- Kunze R, Saedler H, and Gierl A. 1996. The maize transposable element Activator (Ac). *Current Topics in Microbiology and Immunology* 204: 161-94.
- Lang A. 1965. Physiology of flower initiation. *Encyclopedia of Plant Physiology*. Ruhland W ed, pp.1489-536. Berlin: Springer.
- Larsson AS, Landberg K, and Meeks-Wagner DR. 1998. The *TERMINAL FLOWER2* (*TFL2*) gene controls the reproductive transition and meristem identity in *Arabidopsis thaliana*. *Genetics* 149: 597-605.
- Lauster R, Trautner TA, and Noyer-Weidner M. 1989. Cytosine-specific type II DNA methyltransferases: a conserved enzyme core with variable target-recognizing domains. *Journal of Molecular Biology* 206: 305-12.
- Lazo GR, Stein PA, and Ludwig RA. 1991. A DNA transformation-competent *Arabidopsis* genomic library in *Agrobacterium*. *Biotechnology* 9: 963-67.
- Lee I, and Amasino RM. 1995. Effect of vernalization, photoperiod, and light quality on the flowering phenotype of *Arabidopsis* plants containing the *FRIGIDA* gene. *Plant Physiology* 108: 157-62.
- Lee I, Aukerman MJ, Gore SL, Lohman KN, Michaels SD, Weaver LM, John MC, Feldmann KA, and Amasino RM. 1994. Isolation of *LUMIDEPENDENS*: a gene involved in the control of flowering time in *Arabidopsis*. *Plant Cell* 6: 75-83.
- Lee I, Bleecker A, and Amasino RM. 1993. Analysis of naturally occurring late flowering in *Arabidopsis thaliana*. *Molecular and General Genetics* 237: 171-76.
- Lee I, Michaels SD, Masshardt AS, and Amasino RM. 1994. The late-flowering phenotype of *FRIGIDA* and mutations in *LUMIDEPENDENS* is suppressed in the Landsberg *erecta* strain of *Arabidopsis*. *Plant Journal* 6: 903-9.
- Lei H, Oh SP, Okano M, Jüttermann R, Goss KA, and Jaenisch R. 1996. *De novo* DNA cytosine methyltransferase activities in mouse embryonic stem cells. *Development* 122: 3195-205.
- Leonhardt H, Page AW, Weier H-U, and Bestor TH. 1992. A targeting sequence directs DNA methyltransferase to sites of DNA replication in mammalian nuclei. *Cell* 71: 865-73.
- Levy YY, and Dean C. 1998. Control of flowering time. *Current Opinion in Plant Biology* 1: 49-54.
- Li E, Beard C, and Jaenisch R. 1993. Role for DNA methylation in genomic imprinting. *Nature* 366: 362-65.

- Li E, Bestor TH, and Jaenisch R. 1992. Targeted mutation of the DNA methyltransferase gene results in embryonic lethality. *Cell* 69: 915-26.
- Liljegren SJ, Gustafson-Brown C, Pinyopich A, Ditta GS, and Yanofsky MF. 1999. Interactions among *APETALA1*, *LEAFY*, and *TERMINAL FLOWER1* specify meristem fate. *Plant Cell* 11: 1007-18.
- Lin B-Y. 1982. Association of endosperm reduction with parental imprinting in maize. *Genetics* 100: 475-86.
- Lin C, Ahmad M, and Cashmore AR. 1996. Arabidopsis cryptochrome 1 is a soluble protein mediating blue light-dependent regulation of plant growth and development. *Plant Journal* 10: 893-902.
- Lin CT, Yang HY, Guo HW, Mockler T, Chen J, and Cashmore AR. 1998. Enhancement of blue-light sensitivity of Arabidopsis seedlings by a blue light receptor cryptochrome 2. *Proceedings of the National Academy of Sciences of the U.S.A.* 95: 2686-90.
- Lindbo JA, Silva-Rosales L, Proebsting WM, and Dougherty WG. 1993. Induction of a highly specific antiviral state in transgenic plants: implications for regulation of gene expression and virus resistance. *Plant Cell* 5: 1749-59.
- Lisch D, Chomet P, and Freeling M. 1995. Genetic characterization of the Mutator system in maize: behavior and regulation of Mu transposons in a minimal line. *Genetics* 139: 1777-96.
- Liu Y, Oakeley EJ, Sun L, and Jost JP. 1998. Multiple domains are involved in the targeting of the mouse DNA methyltransferase to the DNA replication foci. *Nucleic Acids Research* 26: 1038-45.
- Loo LS, and Cauchi MN. 1992. DNA methylation patterns of the gamma delta beta-globin genes in human fetal and adult erythroid tissues. *American Journal of Hematology* 39: 289-93.
- Luff B, Pawlowski L, and Bender J. 1999. An inverted repeat triggers cytosine methylation of identical sequences in Arabidopsis. *Molecular Cell* 3: 505-11.
- Lund G, Ciceri P, and Viotti A. 1995. Maternal-specific demethylation and expression of specific alleles of zein genes in the endosperm of *Zea mays* L. *Plant Journal* 8: 571-81.
- Luo M, Bilodeau P, Koltunow A, Dennis ES, Peacock WJ, and Chaudhury AM. 1999. Genes controlling fertilization-independent seed development in *Arabidopsis thaliana*. *Proceedings of the National Academy of Sciences of the U.S.A.* 96: 296-301.
- Macknight R, Bancroft I, Page T, Lister C, Schmidt R, Love K, Westphal L, Murphy G, Sherson S, Cobbett C, and Dean C. 1997. *FCA*, a gene controlling flowering time in Arabidopsis, encodes a protein containing RNA-binding domains. *Cell* 89: 737-45.

- Madueno F, Ruiz-Garcia L, Wilkinson M, Haughn G, Salinas J, and Martinez Zapater J. 1996. Different roles of flowering time genes in the activation of floral initiation genes in Arabidopsis. *International Journal of Developmental Biology* Supplement 1: 125S-6S.
- Malagnac F, Grégoire A, Goyon C, Rossignol J-L, and Faugeron G. 1999. *Masc2*, a gene from *Ascobolus* encoding a protein with a DNA-methyltransferase activity *in vitro*, is dispensable for *in vivo* methylation. *Molecular Microbiology* 31: 331-38.
- Malagnac F, Wendel B, Goyon C, Faugeron G, Zickler D, Rossignol J-L, Noyer-Weidner M, Vollmayr P, Trautner TA, and Walter J. 1997. A gene essential for de novo methylation and development in *Ascobolus* reveals a novel type of eukaryotic DNA methyltransferase structure. *Cell* 91: 281-90.
- Mandel MA, and Yanofsky MF. 1995. A gene triggering flower formation in Arabidopsis. *Nature* 377: 522-24.
- Martinez-Zapater JM, and Somerville CR. 1990. Effect of light quality and vernalization on late-flowering mutants of *Arabidopsis thaliana*. *Plant Physiology* 92: 770-776.
- Matsuo K, Silke J, Georgiev O, Marti P, Giovannini N, and Rungger D. 1998. An embryonic demethylation mechanism involving binding of transcription factors to replicating DNA. *EMBO Journal* 17: 1446-53.
- Matzke AJM, Neuhuber F, Park YD, Ambros PF, and Matzke MA. 1994. Homology-dependent gene silencing in transgenic plants: epistatic silencing loci contain multiple copies of methylated transgenes. *Molecular and General Genetics* 244: 219-29.
- Matzke MA, and Matzke AJ. 1998. Epigenetic silencing of plant transgenes as a consequence of diverse cellular defence responses. *Cellular and Molecular Life Sciences* 54: 94-103.
- Matzke MA, Matzke AJM, and Eggleston WB. 1996. Paramutation and transgene silencing: a common response to invasive DNA? *Trends in Plant Science* 1: p382-88.
- Melquist S, Luff B, and Bender J. 1999. Arabidopsis *PAI* gene arrangements, cytosine methylation and expression. *Genetics* 153: 401-13.
- Mertineit C, Yoder JA, Taketo T, Laird DW, Trasler JM, and Bestor TH. 1998. Sex-specific exons control DNA methyltransferase in mammalian germ cells. *Development* 125: 889-97.
- Messeguer R, Ganai MW, Steffens JC, and Tanksley SD. 1991. Characterization of the level, target sites and inheritance of cytosine methylation in tomato nuclear DNA. *Plant Molecular Biology* 16: 753-70.
- Mette MF, van der Winden J, Matzke MA, and Matzke AJM. 1999. Production of aberrant promoter transcripts contributes to methylation and silencing of unlinked homologous promoters in *trans*. *EMBO Journal* 18: 241-48.

- Metzger JD. 1988a. Localization of the site of perception of thermoinductive temperatures in *Thlaspi arvense* L. *Plant Physiology* 88: 424-28.
- Metzger JD. 1988b. Gibberellins and light regulated petiole growth in *Thlaspi arvense* L. *Plant Physiology* 86: 237-40.
- Metzger JD, and Zeevaart JAD. 1980. Effect of photoperiod on the levels of endogenous gibberellins in spinach as measured by combined gas chromatography-selected ion current monitoring. *Plant Physiology* 66: 844-46.
- Metzger JD, and Zeevaart JAD. 1982. Photoperiodic control of gibberellin metabolism in spinach. *Plant Physiology* 69: 287-91.
- Meyer P. 1999. The role of chromatin remodeling in transgene silencing and plant development. *In Vitro Cellular and Developmental Biology - Plant* 35: 29-36.
- Meyer P, Heidmann I, and Niedenhof I. 1993. Differences in DNA-methylation are associated with a paramutation phenomenon in transgenic petunia. *Plant Journal* 4: 89-100.
- Meyer P, Niedenhof I, and ten Lohuis M. 1994. Evidence for cytosine methylation of non-symmetrical sequences in transgenic *Petunia hybrida*. *EMBO Journal* 13: 2084-88.
- Meyer P, and Saedler H. 1996. Homology-dependent gene silencing in plants. *Annual Review of Plant Physiology and Plant Molecular Biology* 47: 23-48.
- Mi S, and Roberts RJ. 1992. How *M.SspI* and *M.HpaII* decide which base to methylate. *Nucleic Acids Research* 20: 4811-16.
- Mi S, and Roberts RJ. 1993. The DNA binding affinity of *HhaI* methylase is increased by a single amino acid substitution in the catalytic center. *Nucleic Acids Research* 21: 2439-64.
- Michaels SD, and Amasino RM. 1999. *FLOWERING LOCUS C* encodes a novel MADS domain protein that acts as a repressor of flowering. *Plant Cell* 11: 949-56.
- Monk M, Boubelik M, and Lehnert S. 1987. Temporal and regional changes in DNA methylation in the embryonic, extraembryonic and germ cell lineages during mouse embryo development. *Development* 99: 371-82.
- Murashige T, and Skoog F. 1962. A revised medium for rapid growth and bioassays with tobacco tissue cultures. *Physiologia Plantarum* 15: 473-97.
- Nakayashiki H, Nishimoto N, Ikeda K, Tosa Y, and Mayama S. 1999. Degenerate MAGGY elements in a subgroup of *Pyricularia grisea*: a possible example of successful capture of a genetic invader by a fungal genome. *Molecular and General Genetics* 261: 958-66.

- Napp-Zinn K. 1969. *Arabidopsis thaliana* (L.) Heynh. *The Induction of Flowering*. Evans LT ed, pp.291-304. Melbourne: MacMillan.
- Napp-Zinn K. 1979. On the genetical basis of vernalization requirement in *Arabidopsis thaliana* (L.) Heynh. *La Physiologie de la Floraison*. Champagnat P, and Jacques R ed, pp.217-20. Paris: Coll. Int. CNRS.
- Napp-Zinn K. 1985. *Arabidopsis thaliana*. *Handbook of Flowering*. Halevy AH ed, pp.492-503. Vol. 1. Boca Raton, Florida: CRC Press.
- Nilsson O, Lee I, Blazquez MA, and Weigel D. 1998. Flowering-time genes modulate the response to *LEAFY* activity. *Genetics* 150: 403-10.
- Noyer-Weidner M, and Trautner TA. 1993. Methylation of DNA in prokaryotes. *EXS* 64: 39-108.
- O'Dell M, Metzloff M, and Flavell RB. 1999. Post-transcriptional gene silencing of chalcone synthase in transgenic petunias, cytosine methylation and epigenetic variation. *Plant Journal* 18: 33-42.
- Oakeley EJ, and Jost JP. 1996. Non-symmetrical cytosine methylation in tobacco pollen DNA. *Plant Molecular Biology* 31: 927-30.
- Okano M, Xie S, and Li E. 1998. Cloning and characterization of a family of novel mammalian DNA (cytosine-5) methyltransferases. *Nature Genetics* 19: 219-20.
- Okano M, Xie SP, and Li E. 1998. *DNMT2* is not required for *de novo* and maintenance methylation of viral DNA in embryonic stem cells. *Nucleic Acids Research* 26: 2536-40.
- Onouchi H, and Coupland G. 1998. The regulation of flowering time of *Arabidopsis* in response to daylength. *Journal of Plant Research* 111: 271-75.
- Page T, Macknight R, Yang CH, and Dean C. 1999. Genetic interactions of the *Arabidopsis* flowering time gene *FCA*, with genes regulating floral initiation. *Plant Journal* 17: 231-39.
- Palmgren G, Mattson O, and Okkels FT. 1991. Specific levels of DNA methylation in various tissues, cell lines, and cell types of *Daucus carota*. *Plant Physiology* 95: 174-78.
- Park DH, Somers DE, Kim YS, Choy YH, Lim HK, Soh MS, Kim HJ, Kay SA, and Nam HG. 1999. Control of circadian rhythms and photoperiodic flowering by the *Arabidopsis* *GIGANTEA* gene. *Science* 285: 1579-82.
- Park Y-D, Papp I, Moscone EA, Iglesias VA, Vaucheret H, Matzke AJM, and Matzke MA. 1996. Gene silencing mediated by promoter homology occurs at the level of transcription and results in meiotically heritable alterations in methylation and gene activity. *Plant Journal* 9: 183-94.

- Paro R, and Harte PJ. 1996. The role of Polycomb group and Trithorax group chromatin complexes in the maintenance of determined cell states. *Epigenetic mechanisms of gene regulation*. Russo A, Martienssen RA, and Riggs AD ed, pp.507-28. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press.
- Paroush Z, Keshet I, Yisraeli J, and Cedar H. 1990. Dynamics of demethylation and activation of the alpha-actin gene in myoblasts. *Cell* 63: 1229-37.
- Patterson GI, Thorpe CJ, and Chandler VL. 1993. Paramutation, an allelic interaction, is associated with a stable and heritable reduction of transcription of the maize b regulatory gene. *Genetics* 135: p881-94.
- Peitsch MC. 1995. Protein modelling by E-Mail. *Bio/Technology* 13: 658-60.
- Peitsch MC. 1996. ProMod and Swiss-Model: Internet-based tools for automated comparative protein modelling. *Biochemical Society Transactions* 24: 274-79.
- Peitsch MC, and Jongeneel V. 1993. A 3-dimensional model for the CD40 ligand predicts that it is a compact trimer similar to the tumor necrosis factors. *International Immunology* 5: 233-38.
- Pelissier T, Thalmeir S, Kempe D, Sanger HL, and Wassenegger M. 1999. Heavy *de novo* methylation at symmetrical and non-symmetrical sites is a hallmark of RNA-directed DNA methylation. *NUCLEIC ACIDS RESEARCH* 27: 1625-34.
- Peng J, Carol P, Richards DE, King KE, Cowling RJ, Murphy GP, and Harberd NP. 1997. The *Arabidopsis GAI* gene defines a signaling pathway that negatively regulates gibberellin responses. *Genes and Development* 11: 3194-205.
- Peng J, and Harberd NP. 1993. Derivative alleles of the *Arabidopsis* gibberellin-insensitive (*gai*) mutation confer a wild-type phenotype. *Plant Cell* 5: 351-60.
- Pharis RP, and King RW. 1985. Gibberellins and reproductive development in seed plants. *Annual Reviews in Plant Physiology* 36: 517-68.
- Pinarbasi E, Elliott J, and Hornby DP. 1996. Activation of a yeast pseudo DNA methyltransferase by deletion of a single amino acid. *Journal of Molecular Biology* 257: 804-13.
- Pineiro M, and Coupland G. 1998. The control of flowering time and floral identity in *Arabidopsis*. *Plant Physiology* 117: 1-8.
- Pirrotta V. 1997. Chromatin-silencing mechanisms in *Drosophila* maintain patterns of gene expression. *Trends in Genetics* 13: 314-18.
- Pósfai J, Bhagwat AS, Pósfai G, and Roberts RJ. 1989. Predictive motifs derived from cytosine methyltransferases. *Nucleic Acids Research* 7: 2421-35.

- Pradhan S, and Adams RLP. 1995. Distinct CG and CNG DNA methyltransferases in *Pisum sativum*. *Plant Journal* 7: 471-81.
- Pradhan S, Cummings M, Roberts RJ, and Adams RLP. 1998. Isolation, characterization and baculovirus-mediated expression of the cDNA encoding cytosine DNA methyltransferase from *Pisum sativum*. *Nucleic Acids Research* 26: 1214-22.
- Proffitt JH, Davie JR, Swinton D, and Hattman S. 1984. 5-methylcytosine is not detectable in *Saccharomyces cerevisiae* DNA. *Molecular and Cellular Biology* 4: 985-88.
- Pröls F, and Meyer P. 1992. The methylation patterns of chromosomal integration regions influence gene activity of transferred DNA in *Petunia hybrida*. *Plant Journal* 2: 465-75.
- Purvis ON. 1940. Vernalization of fragments of embryo tissue. *Nature* 145: 462.
- Putterill J, Robson F, Lee K, Simon R, and Coupland G. 1995. The *CONSTANS* gene of *Arabidopsis* promotes flowering and encodes a protein showing similarities to zinc finger transcription factors. *Cell* 80: 847-57.
- Ramchandani S, Bhattacharya SK, Cervoni N, and Szyf M. 1999. DNA methylation is a reversible biological signal. *Proceedings of the National Academy of Sciences of the U.S.A.* 96: 6107-12.
- Ratcliffe OJ, Amaya I, Vincent CA, Rothstein S, Carpenter R, Coen ES, and Bradley DJ. 1998. A common mechanism controls the life cycle and architecture of plants. *Development* 125: 1609-15.
- Ratcliffe OJ, Bradley DJ, and Coen ES. 1999. Separation of shoot and floral identity in *Arabidopsis*. *Development* 126: 1109-20.
- Razin A, and Kafri T. 1994. DNA methylation from embryo to adult. *Progress in Nucleic Acid Research and Molecular Biology* 48: 53-81.
- Razin A, and Riggs AD. 1980. DNA methylation and gene function. *Science* 210: 604-10.
- Redei GP. 1962. Supervital mutants of *Arabidopsis*. *Genetics* 47: 443-60.
- Regev A, Lamb MJ, and Jablonka E. 1998. The role of DNA methylation in invertebrates - developmental regulation or genome defense. *Molecular Biology and Evolution* 15: 880-891.
- Reik W. 1989. Genomic imprinting and genetic disorders in man. *Trends in Genetics* 5: 331-36.
- Reinisch KM, Chen L, Verdine GL, and Lipscomb WN. 1994. Crystallization and preliminary crystallographic analysis of a DNA (cytosine-5)-methyltransferase from *Haemophilus aegyptius* bound covalently to DNA. *Journal of Molecular Biology* 238: 626-29.

- Reinisch KM, Chen L, Verdine GL, and Lipscomb WN. 1995. The crystal structure of *HaeIII* methyltransferase covalently complexed to DNA: an extrahelical cytosine and rearranged base pairing. *Cell* 82: 143-53.
- Rhodes K, Rippe RA, Umezawa A, Nehls M, Brenner DA, and Breindl M. 1994. DNA methylation represses the murine alpha 1(I) collagen promoter by an indirect mechanism. *Molecular Cell Biology* 14: 5950-5960.
- Rhounim L, Rossignol JL, and Faugeron G. 1992. Epimutation of repeated genes in *Ascobolus immersus*. *EMBO Journal* 11: 4451-57.
- Riggs AD. 1975. X inactivation, differentiation, and DNA methylation. *Cytogenetics and Cell Genetics* 14: 9-25.
- Romanov GA, and Vanyushin BF. 1981. Methylation of reiterated sequences in mammalian DNAs: Effects of the tissue type, age, malignancy and hormonal induction. *Biochimica Et Biophysica Acta* 653: 204-18.
- Ronchi A, Petroni K, and Tonelli C. 1995. The reduced expression of endogenous duplications (REED) in the maize *R* gene family is mediated by DNA methylation. *EMBO Journal* 14: 5318-28.
- Ronemus MJ, Galbiati M, Ticknor C, Chen J, and Dellaporta SL. 1996. Demethylation-induced developmental pleiotropy in *Arabidopsis*. *Science* 273: 654-57.
- Ross JJ, Murfet IC, and Reid JB. 1997. Gibberellin mutants. *Physiologica Plantarum* 100: 550-560.
- Rossignol JL, and Faugeron G. 1994. Gene inactivation triggered by recognition between DNA repeats. *Experientia* 50: 307-17.
- Rougier N, Bourc'his D, Gomes DM, Niveleau A, Plachot M, Paldi A, and Viegas-Pequignot E. 1998. Chromosome methylation patterns during mammalian preimplantation development. *Genes and Development* 12: 2108-13.
- Ruiz-Garcia L, Madueno F, Wilkinson M, Haughn G, Salinas J, and Martinez-Zapater JM. 1997. Different roles of flowering-time genes in the activation of floral initiation genes in *Arabidopsis*. *Plant Cell* 9: 1921-34.
- Sakai H, Medrano LJ, and Meyerowitz EM. 1995. Role of *SUPERMAN* in maintaining *Arabidopsis* floral whorl boundaries. *Nature* 378: 199-203.
- Sambrook J, Fritsch EF, and Maniatis T. 1989. *Molecular Cloning: A Laboratory Manual*. Cold Spring Harbor, NY: Cold Spring Harbor Laboratory Press.
- Sanda SL, and Amasino RM. 1995. Genetic and physiological analysis of flowering time in the C24 line of *Arabidopsis thaliana*. *Weeds World* 2.

- Sanda SL, and Amasino RM. 1996. Ecotype-specific expression of a flowering mutant phenotype in *Arabidopsis thaliana*. *Plant Physiology* 111: 641-44.
- Schaffer R, Ramsay N, Samach A, Corden S, Putterill J, Carre IA, and Coupland G . 1998. The late elongated hypocotyl mutation of *Arabidopsis* disrupts circadian rhythms and the photoperiodic control of flowering. *Cell* 93: 1219-29.
- Scheid OM, Afsar K, and Paszkowski J. 1998. Release of epigenetic gene silencing by trans-acting mutations in *Arabidopsis*. *Proceedings of the National Academy of Sciences of the U.S.A.* 95: 632-37.
- Schwabe WW. 1954. Factors controlling flowering in the chrysanthemum. IV. The site of vernalization and translocation of the stimulus. *Journal of Experimental Botany* 5: 389-400.
- Schwabe WW. 1955. Factors controlling flowering in the chrysanthemum. V. Devernalization in relation to high temperature and low light intensity treatments. *Journal of Experimental Botany* 6: 435-50.
- Selker EU. 1997. Epigenetic phenomena in filamentous fungi: useful paradigms or repeat-induced confusion? *Trends in Genetics* 13: 296-300.
- Selker EU, Cambareri EB, Jensen BC, and Haack KR. 1987. Rearrangement of duplicated DNA in specialized cells of *Neurospora*. *Cell* 51: 741-52.
- Shannon S, and Meeks-Wagner DR. 1991. A mutation in the *Arabidopsis TFL1* gene affects inflorescence meristem development. *Plant Cell* 3: 877-92.
- Sheldon CC, Burn JE, Perez PP, Metzger J, Edwards JA, Peacock WJ, and Dennis ES. 1999. The *FLF* MADS box gene: A repressor of flowering in *Arabidopsis* regulated by vernalization and methylation. *Plant Cell* 11: 445-58.
- Sheldon CC, Rouse DT, Finnegan EJ, Peacock WJ, and Dennis ES. in press. The molecular basis of vernalization: the central role of *FLC*. *Proceedings of the National Academy of Sciences of the U.S.A.*
- Shemer R, Kafri T, O'Connell A, Eisenberg S, Breslow JL, and Razin A. 1991. Methylation changes in the apolipoprotein AI gene during embryonic development of the mouse. *Proceedings of the National Academy of Sciences of the U.S.A.* 88: 11300-11304.
- Simon R, Igeño MI, and Coupland G. 1996. Activation of floral meristem identity genes in *Arabidopsis*. *Nature* 384: 59-61.
- Singer MJ, Marcotte BA, and Selker EU. 1995. DNA methylation associated with repeat-induced point mutation in *Neurospora crassa*. *Molecular Cell Biology*.

- Singer MJ, and Selker EU. 1995. Genetic and epigenetic inactivation of repetitive sequences in *Neurospora crassa*: RIP, DNA methylation, and quelling. *Current Topics in Microbiology and Immunology*.
- Smith HA, Swaney SL, Parks TD, Wernsman EA, and Dougherty WG. 1994. Transgenic plant virus resistance mediated by untranslatable sense RNAs: expression, regulation, and fate of nonessential RNAs. *Plant Cell* 6: 1441-53.
- Smyth DR, Bowman JL, and Meyerowitz EM. 1990. Early flower development in *Arabidopsis*. *Plant Cell* 2: 755-67.
- Snedecor GW, and Cochran WG. 1967. *Statistical Methods*. 6th edition, 130-131, 548. Ames, Iowa, USA: The Iowa State University Press.
- Stam M, Mol JNM, and Kooter JM. 1997. The silence of genes in transgenic plants. *Annals of Botany* 79: 3-12.
- Stam, M, A Viterbo, JNM Mol, and JM Kooter. 1998. Position-dependent methylation and transcriptional silencing of transgenes in inverted T-DNA repeats - implications for posttranscriptional silencing of homologous host genes in plants. *Molecular and Cellular Biology* 18: 6165-77.
- Stein R, Gruenbaum Y, Pollack Y, Razin A, and Cedar H . 1982. Clonal inheritance of the pattern of DNA methylation in mouse cells. *Proceedings of the National Academy of Sciences of the U.S.A.* 79: 61-65.
- Sun T, Goodman HM, and Ausubel FM. 1992. Cloning the *Arabidopsis GAI* locus by genomic subtraction. *Plant Cell* 4: 119-28.
- Sun TP, and Kamiya Y. 1994. The *Arabidopsis GAI* locus encodes the cyclase entkaurene synthetase A of gibberellin biosynthesis. *Plant Cell* 6: 1509-18.
- Sung ZR, Belachew A, Shunong B, and Bertrand-Garcia R. 1992. *EMF*, an *Arabidopsis* gene required for vegetative shoot development. *Science* 258: 1645-47.
- Swisher JF, Rand E, Cedar H, and Marie Pyle A. 1998. Analysis of putative RNase sensitivity and protease insensitivity of demethylation activity in extracts from rat myoblasts. *Nucleic Acids Research* 26: 5573-80.
- Tajima S, Tsuda H, Wakabayashi N, Asano A, Mizuno S, and Nishimori K. 1995. Isolation and expression of a chicken DNA methyltransferase cDNA. *Journal of Biochemistry* 117: 1050-1057 .
- Talon M, Koornneef M, and Zeevaart JAD. 1990. Accumulation of C₁₉-gibberellins in the gibberellin-insensitive dwarf mutant *gai* of *Arabidopsis thaliana* (L.) Heynh. *Planta* 182: 501-5.

- Theiss G, Schleicher R, Schimpff-Weiland G, and Follmann H. 1987. DNA methylation in wheat. Purification and properties of DNA methyltransferase. *European Journal of Biochemistry* 167: 89-96.
- Urieli-Shoval S, Gruenbaum Y, Sedat J, and Razin A. 1982. The absence of detectable methylated bases in *Drosophila melanogaster* DNA. *FEBS Letters* 146: 148-52.
- Vairapandi M, and Duker NJ. 1993. Enzymic removal of 5-methylcytosine from DNA by a human DNA-glycosylase. *Nucleic Acids Research* 21: 5323-27.
- Vairapandi M, and Duker NJ. 1996. Partial purification and characterization of human 5-methylcytosine-DNA glycosylase. *Oncogene* 13: 933-38.
- van Blokland R, Lohuis Mten, Meyer P, Van Blokland R, and Ten Lohuis M. 1997. Condensation of chromatin in transcriptional regions of an inactivated plant transgene: evidence for an active role of transcription in gene silencing. *Molecular and General Genetics* 257: 1-13.
- van Blokland R, van der Geest N, Mol JNM, and Kooter JM. 1994. Transgene-mediated suppression of chalcone synthase expression in *Petunia hybrida* results from an increase in RNA turnover. *Plant Journal* 6: 861-77.
- Varga-Weisz PD, and Becker PB. 1998. Chromatin-remodeling factors: machines that regulate? *Current Opinion in Cell Biology* 10: 346-53.
- Vaucheret H, Béclin C, Elmayan T, Feuerbach F, Godon C, Morel J, Mourrain P, Palauqui J, and Vernhettes S. 1998. Transgene-induced gene silencing in plants. *Plant Journal* 16: 651-59.
- Vielle-Calzada JP, Thomas J, Spillane C, Coluccio A, Hoepfner MA, and Grossniklaus U. 1999. Maintenance of genomic imprinting at the Arabidopsis *MEDEA* locus requires zygotic *DDMI* activity. *Genes and Development* 13: 2971-82.
- Vince-Prue D. 1975. Vernalization. *Photoperiodism in plants*. Vince-Prue D, pp.262-91. London: McGraw Hill.
- Vongs A, Kakutani T, Martienssen RA, and Richards EJ. 1993. *Arabidopsis thaliana* DNA methylation mutants. *Science* 260: 1926-28.
- Walker EL. 1998. Paramutation of the R1 locus of maize is associated with increased cytosine methylation. *Genetics* 148: 1973-81.
- Walsh CP, Chaillet JR Bestor TH. 1998. Transcription of IAP endogenous retroviruses is constrained by cytosine methylation. *Nature Genetics* 20: 116-17.
- Wang L, Heinlein M, Kunze R, and Wang LH. 1996. Methylation pattern of Activator transposase binding sites in maize endosperm. *Plant Cell* 8: 747-58.

- Waterhouse PM, Graham MW, and Wang MB. 1998. Virus resistance and gene silencing in plants can be induced by simultaneous expression of sense and antisense RNA. *Proceedings of the National Academy of Sciences of the U.S.A.* 95: 13959-64.
- Weigel D, Alvarez J, Smyth DR, Yanofsky MF, and Meyerowitz EM. 1992. *LEAFY* controls floral meristem identity in Arabidopsis. *Cell* 69: 843-59.
- Weigel D, and Nilsson O. 1995. A developmental switch sufficient for flower initiation in diverse plants. *Nature* 377: 495-500.
- Weiss A, Keshet I, Razin A, and Cedar H. 1996. DNA demethylation *in vitro*: involvement of RNA. *Cell* 86: 709-18.
- Wellensiek SJ. 1964. Dividing cells as the prerequisite for vernalization. *Plant Physiology* 39: 832-35.
- Wigler M, Levy D, and Perucho M. 1981. The somatic replication of DNA methylation. *Cell* 24: 33-40.
- Wilkinson CR, Bartlett R, Nurse P, and Bird AP. 1995. The fission yeast gene *pmt1+* encodes a DNA methyltransferase homologue. *Nucleic Acids Research* 23: 203-10.
- Wilson RN, Heckman JW, and Somerville CR. 1992. Gibberellin is required for flowering in Arabidopsis thaliana under short days. *Plant Physiology* 100: 403-8.
- Wilson RN, and Somerville CR. 1995. Phenotypic suppression of the gibberellin-insensitive mutant (*gai*) of Arabidopsis. *Plant Physiology* 108: 495-502.
- Wu K, Li L, Gage DA, and Zeevaart JAD. 1996. Molecular cloning and photoperiod-regulated expression of gibberellin 20-oxidase from the long day plant spinach. *Plant Physiology* 110: 547-54.
- Wyszynski MW, Gabbara S, and Bhagwat AS. 1992. Substitutions of a cysteine conserved among DNA cytosine methylases result in a variety of phenotypes. *Nucleic Acids Research* 20: 319-26.
- Xie S, Wang Z, Okano M, Nogami M, Li Y, He W, Okamura K, and Li E. 1999. Cloning, expression and chromosome locations of the human *DNMT3* gene family. *Gene* 236: 87-95.
- Xu S, Xiao J, Posfai J, Maunus R, and Benner J 2nd. 1997. Cloning of the *BssHII* restriction-modification system in *Escherichia coli*: *BssHII* methyltransferase contains circularly permuted cytosine-5 methyltransferase motifs. *Nucleic Acids Research* 25: 3991-94.
- Yang CH, Chen LJ, and Sung ZR. 1995. Genetic regulation of shoot development in Arabidopsis: role of the EMF genes. *Developmental Biology* 169: 421-35.

- Yen R-W C, Vertino PM, Nelkin BD, Yu JJ, El-Deiry W, Cumaraswamy A, Lennon GG, Trask BJ, Celano P, and Baylin SB. 1992. Isolation and characterization of the cDNA encoding human DNA methyltransferase. *Nucleic Acids Research* 20: 2287-91.
- Yoder JA, and Bestor TH. 1998. A candidate mammalian DNA methyltransferase related to Pmt1P of fission yeast. *Human Molecular Genetics* 7: 279-84.
- Yoder JA, Walsh CP, and Bestor TH. 1997. Cytosine methylation and the ecology of intragenomic parasites. *Trends in Genetics* 13: 335-40.
- Yoder JA, Yen R-W C, Vertino PM, Bestor TH, and Baylin SB. 1996. New 5' regions of the murine and human genes for DNA (cytosine-5)-methyltransferase. *Journal of Biological Chemistry* 271: 31092-97.
- Zagotta MT, Hicks KA, Jacobs CI, Young JC, Hangarter RP, and Meeks-Wagner DR. 1996. The Arabidopsis ELF3 gene regulates vegetative photomorphogenesis and the photoperiodic induction of flowering. *Plant Journal* 10: 691-702.
- Zeevaart JAD. 1983. Gibberellins and flowering. *The Biochemistry and Physiology of Gibberellins*. Crozier A ed, pp.333-74. Vol. 2. New York: Praeger.
- Zhou YX, Magill CW, Magill JM, and Newton RJ. 1998. An apparent case of nonsymmetrical and sustained strand-specific hemi-methylation in the DC8 gene of carrot. *Genome* 41: 23-33.