

REFERENCES

- Aalfs, J.D.; Kingston, R.E.** What does 'chromatin remodeling' mean? *Trends Biochem Sci* **25** (11) 2000. pp. 548-555.
- Agarwal, S.; Rao, A.** Modulation of chromatin structure regulates cytokine gene expression during T cell differentiation. *Immunity* **9** (6) 1998. pp. 765-775.
- Aladjem, M.I.; Rodewald, L.W.; Kolman, J.L.; Wahl, G.M.** Genetic dissection of a mammalian replicator in the human beta-globin locus. *Science* **281** (5379) 1998. pp. 1005-1009.
- Alami, R.; Greally, J.M.; Tanimoto, K.; Hwang, S.; Feng, Y.; Engel, J.D.; Fiering, S.; Bouhassira, E.E.** Beta-globin YAC transgenes exhibit uniform expression levels but position effect variegation in mice. *Hum Mol Gen* **9** (4) 2000. pp. 631-636.
- Alberts, B.; Bray, D.; Lewis, J.; Raff, M.; Roberts, K.; Watson, J.D.** *Molecular Biology of the Cell, third edition* 1994. pp. 368-369.
- Albitar, M.; Katsumata, M.; Liebhaber, S.A.** Human alpha-globin genes demonstrate autonomous developmental regulation in transgenic mice. *Mol Cell Biol* **11** (7) 1991. pp. 3786-3794.
- Allison, A.C.** Parasitological reviews: malaria in carriers of the sickle-cell trait and in newborn children. *Exp Parasitol* **6** 1957. pp. 418-447.
- Anderson, J.D.; Widom, J.** Sequence and position-dependence of the equilibrium accessibility of nucleosomal DNA target sites. *J Mol Biol* **296** (4) 2000. pp. 979-987.
- Andrews, N.C.; Erdjument-Bromage, H.; Davidson, M.B.; Tempst, P.; Orkin, S.H.** Erythroid transcription factor NF-E2 is a haematopoietic-specific basic-leucine zipper protein. *Nature* **362** (6422) 1993. pp. 722-728.
- Andrews, N.C.; Kotkow, K.J.; Ney, P.A.; Erdjument-Bromage, H.; Tempst, P.; Orkin, S.H.** The ubiquitous subunit of erythroid transcription factor NF-E2 is a small basic-leucine zipper protein related to the v-maf oncogene. *Proc Natl Acad Sci U S A* **90** (24) 1993. pp. 11488-11492.
- Andrulis, E.D.; Neiman, A.M.; Zappulla, D.C.; Sterngranz, R.** Perinuclear localization of chromatin facilitates transcriptional silencing. *Nature* **395** (6693) 1998. pp. 525-525.
- Antequera, F.; Bird, A.** *DNA methylation: Molecular Biology and Biological significance* 1993. pp. 169-185.
- Antequera, F.B.A.; Bird, A.P.** Number of CpG islands and genes in human and mouse. *Proc Natl Acad Sci U S A* **90** (24) 1993. pp. 11995-11999.
- Antoniou, M.; Geraghty, F.; Hurst, J.; Grosveld, F.** Efficient 3'-end formation of human beta-globin mRNA in vivo requires sequences within the last intron but occurs independently of the splicing reaction. *Nucleic Acids Res* **26** (3) 1998. pp. 721-729.
- Antoniou, M.; Grosveld, F.** beta-globin dominant control region interacts differently with distal and proximal promoter elements. *Genes Dev* **4** (6) 1990. pp. 1007-1013.
- Antoniou, M.; de Boer, E.; Habets, G.; Grosveld, F.** The human beta-globin gene contains multiple regulatory regions: identification of one promoter and two downstream enhancers. *EMBO J* **7** (2) 1988. pp. 377-384.
- Arcasoy, M.O.; Romana, M.; Fabry, M.E.; Skarpida, E.; Nagel, R.L.; Forget, B.G.** High levels of human gamma-globin gene expression in adult mice carrying a transgene of deletion-type hereditary persistence of fetal hemoglobin. *Mol Cell Biol* **17** (4) 1997. pp. 2076-2089.
- Arents, G.; Burlingame, R.W.; Wang, B.C.; Moudrianakis, E.N.** The nucleosomal core histone octamer at 3.1 Å resolution: a tripartite protein assembly and a left-handed superhelix. *Proc Natl Acad Sci U S A* **88** (22) 1991. pp. 10148-10152.
- Armstrong, J.A.; Bieker, J.J.; Emerson, B.M.** A SWI/SNF-related chromatin remodeling complex, E-RC1, is required for tissue-specific transcriptional regulation by EKLF in vitro. *Cell* **95** (1) 1998. pp. 93-104.
- Asano, H.; Li, X.S.; Stamatoyannopoulos, G.** FKLF, a novel Kruppel-like factor that activates human embryonic and fetal beta-like globin genes. *Mol Cell Biol* **19** (5) 1999. pp. 3571-3579.
- Asano, H.; Li, X.S.; Stamatoyannopoulos, G.** FKLF-2: a novel Kruppel-like transcriptional factor that activates globin and other erythroid lineage genes. *Blood* **95** (II) 2000. pp. 3578-3584.
- Banerji, J.; Rusconi, S.; Schaffner, W.** Expression of a beta-globin gene is enhanced by remote SV40 DNA sequences. *Cell* **27** 1981. pp. 299-308.
- Bannister, A.J.; Zegerman, P.; Partridge, J.F.; Miska, E.A.; Thomas, J.O.; Allshire, R.C.; Kouzarides, T.** Selective recognition of methylated lysine 9 on histone H3 by the HP1 chromo domain. *Nature* **410** (6824) 2001. pp. 120-124.
- Bannister, A.J.; Miska, E.; Gorlich, D.; Kouzarides, T.** Acetylation of importin-alpha nuclear import factors by CBP/p300. *Curr Biol* **10** (8) 2000. pp. 467-470.
- Bateson, G** *Mind and Nature* 1997. pp. ?-?.
- Bauer, U-T.; Daujat, S.; Nielsen, S.J.; Nightingale, J.; Kouzarides, T.** Methylation at arginine 17 of histone H3 is linked to gene activation. *EMBO rep* **1** (3) 2002. pp. 39-44.
- Bean, T.L.; Ney, P.A.** Multiple regions of p45 NF-E2 are required for beta-globin gene expression in erythroid cells. *Nucleic Acids Res* **25** (12) 1997. pp. 2509-2515.
- Behringer, R.R.; Hammer, R.E.; Brinster, R.L.; Palmiter, R.D.; Townes, T.M.** Two 3' sequences direct adult erythroid-specific expression of human beta-globin genes in transgenic mice. *Proc Natl Acad Sci U S A* **84** (20) 1987. pp. 7056-7060.
- Behringer, R.R.; Ryan, T.M.; Palmiter, R.D.; Brinster, R.L.; Townes, T.M.** Human gamma- to beta-globin gene switching in transgenic mice. *Genes Dev* **4** (3) 1990. pp. 380-389.
- Belikov, S.; Gelius, B.; Wrangle, O.** Hormone-induced nucleosome positioning in the MMTV promoter is reversible. *EMBO J* **20** (2001). pp. 2802-2811.
- Bell, A.C.; West, A.G.; Felsenfeld, G.** Insulators and boundaries: versatile regulatory elements in the eukaryotic genome. *Science* **291** (5503) 2001. pp. 447-450.
- Bell, A.C.; West, A.G.; Felsenfeld, G.** The protein CTCF is required for the enhancer blocking activity of vertebrate insulators. *Cell* **98** (3) 1999. pp. 387-396.
- Bender, M.A.; Bulger, M.; Halow, J.; Telling, A.; Close, J.; Groudine, M.** Beta-globin gene switching and DNase I sensitivity of the endogenous beta-globin locus in mice do not require the locus control region. *Mol Cell* **5** (2) 2000. pp. 387-393.
- Bender, M.A.; Reik, A.; Close, J.; Telling, A.; Epner, E.; Fiering, S.; Hardison, R.C.; Groudine, M.** Description and targeted deletion of 5' hypersensitive site 5 and 6 of the mouse beta-globin locus control region. *Blood* **92** (II) 1998. pp. 4394-4403.
- Berk, A.J.** Regulation of eukaryotic transcription factors by post-translational modification. *Biochim Biophys Acta* **1009** (2) 1989. pp. 103-109.
- Bernet, A.; Sabatier, S.; Picketts, D.J.; Ouazana, R.; Morle, F.; Higgs, D.R.; Godet, J.** Targeted inactivation of the major positive regulatory element (HS-40) of the human alpha-globin gene locus. *Blood* **86** (3) 1995. pp. 1202-1211.
- Berry, M.; Grosveld, F.; Dillon, N.A.** A single point mutation is the cause of the Greek form of hereditary persistence of fetal haemoglobin. *Nature* **358** (6386) 1992. pp. 499-502.
- Bhaumik, S.R.; Green, M.R.** SAGA is an essential in vivo target of the yeast acidic activator Gal4p. *Genes Dev* **15** (15) 2001. pp. 1935-1945.
- Bhoite, L.T.; Yu, Y.; Stillman, D.J.** The Swi5 activator recruits the Mediator complex to the HO promoter without RNA polymerase II. *Genes Dev* **15** (18) 2001. pp. 2457-2469.
- Bienz, M.; Muller, J.** Transcriptional silencing of homeotic genes in Drosophila. *Bioessays* **17** (9) 1995. pp. 775-784.
- Bird, A.P.; Wolffe, A.P.** Methylation-induced repression--belts, braces, and chromatin. *Cell* **99** (5) 1999. pp. 451-454.

- Bird, A.P.; Taggart, M.; Nicholls, R.; Higgs, D.** Non-methylated CpG-rich islands at the human alpha-globin locus: implications for evolution of the alpha-globin pseudogene. *EMBO J* **6** (4) 1987. pp. 999-1004.
- Blobel, G.A.; Nakajima, T.; Eckner, R.; Montminy, M.; Orkin, S.H.** CREB-binding protein cooperates with transcription factor GATA-1 and is required for erythroid differentiation. *Proc Natl Acad Sci U S A* **95** (5) 1998. pp. 2061-2066.
- Blom van Assendelft, G.; Hanscombe, O.; Grosveld, F.; Greaves, D.R.** The beta-globin dominant control region activates homologous and heterologous promoters in a tissue-specific manner. *Cell* **56** (6) 1989. pp. 969-977.
- Blomquist, P.; Belikov, S.; Wrangle, O.** Increased nuclear factor 1 binding to its nucleosomal site mediated by sequence-dependent DNA structure. *Nucleic Acids Res* **27** (2) 1999. pp. 517-525.
- Bloom, W.; Bartelmez, G.W.** - *Am J Anat* **67** 1940. pp. 21-?.
- Bloomfield, I.C.; Vaughn, V.; Rest, R.S.; Eisenstein, B.I.** Allelic exchange in Escherichia coli using the Bacillus subtilis sacB gene and a temperature-sensitive pSC101 replicon. *Mol Microbiol* **5** (6) 1991. pp. 1447-1457.
- Bodine, D.M.; Ley, T.J.** An enhancer element lies 3' to the human A gamma globin gene. *EMBO J* **10** 1987. pp. 2997-3004.
- Bohm, L.; Crane-Robinson, C.** Proteases as structural probes for chromatin: the domain structure of histones. *Biosci Rep* **4** (5) 1984. pp. 365-86.
- Boyes, J.; Byfield, P.; Nakatani, Y.; Ogryzko, V.** Regulation of activity of the transcription factor GATA-1 by acetylation. *Nature* **396** (6711) 1998. pp. 594-598.
- Boyes, J.; Bird, A.** DNA methylation inhibits transcription indirectly via a methyl-CpG binding protein. *Cell* **64** (6) 1991. pp. 1123-1134.
- Boyes, J.; Bird, A.** Repression of genes by DNA methylation depends on CpG density and promoter strength: evidence for involvement of a methyl-CpG binding protein *EMBO J* **11** (1) 1992. pp. 327-333.
- Brand, A.H.; Breeden, L.; Abraham, J.; Sternglanz, R.; Nasmyth, K.** Characterization of a silencer in yeast: a DNA sequence with properties opposite to those of a transcriptional enhancer. *Cell* **41** (1) 1985. pp. 41-48.
- Brehm, A.; Kouzarides, T.** Retinoblastoma protein meets chromatin. *Trends Genet* **24** (4) 1999. pp. 142-145.
- Breiling, A.; Bonte, E.; Ferrari, S.; Becker, P.; Paro, R.** The Drosophila polycomb protein interacts with nucleosomal core particles In vitro via its repression domain. *Mol Cell Biol* **19** (12) 1999. pp. 8451-8460.
- Brock, H.W.; van Lohuizen, M.** The Polycomb group--no longer an exclusive club? *Curr Opin Genetics Dev* **11** (2) 2001. pp. 175-181.
- Brown, K.E.; Guest, S.S.; Smale, S.T.; Hahm, K.; Merkenschlager, M.; Fisher, A.G.** Association of transcriptionally silent genes with Ikaros complexes at centromeric heterochromatin. *Cell* **91** (6) 1997. pp. 845-854.
- Brown, K.E.; Baxter, J.; Graf, D.; Merkenschlager, M.; Fisher, A.G.** Dynamic repositioning of genes in the nucleus of lymphocytes preparing for cell division. *Mol Cell* **3** (2) 1999. pp. 207-217.
- Brown, K.E.; Amoilis, S.; Horn, J.M.; Buckle, V.J.; Higgs, D.R.; Merkenschlager, M.; Fisher, A.G.** Expression of alpha- and beta-globin genes occurs within different nuclear domains in haemopoietic cells. *Nature Cell Biol* **3** (6) 2001. pp. 602-606.
- Brownell, J.E.; Zhou, J.; Ranalli, T.; Kobayashi, R.; Edmondson, D.G.; Roth, S.Y.; Allis, C.D.** Tetrahymena histone acetyltransferase A: a homolog to yeast Gcn5p linking histone acetylation to gene activation. *Cell* **84** (6) 1996. pp. 843-851.
- Bulger, M.; Sawado, T.; Schubeler, D.; Groudine, M.** ChIPs of the beta-globin locus: unraveling gene regulation within an active domain. *Curr Opin Genetics Dev* **12** (2) 2002. pp. 170-177.
- Bungert, J.; Dave, U.; Lim, K.C.; Lieuw, K.H.; Shavit, J.A.; Liu, Q.; Engel, J.D.** Synergistic regulation of human beta-globin gene switching by locus control region elements HS3 and HS4. *Genes Dev* **9** (24) 1995. pp. 3083-3096.
- Bungert, J.; Tanimoto, K.; Patel, S.; Liu, Q.; Fear, M.; Engel, J.D.** Hypersensitive site 2 specifies a unique function within the human beta-globin locus control region to stimulate globin gene transcription. *Mol Cell Biol* **19** (4) 1999. pp. 3062-3072.
- Bunn, H.F.; Forget, B.G.** *Hemoglobin: Molecular, genetic and clinical aspects*. 1986. pp. ?-?.
- Buratowski, S.; Hahn, S.; Guarante, L.; Sharp, P.A.** Five intermediate complexes in transcription initiation by RNA polymerase II *Cell* **56** (4) 1989. pp. 549-561.
- Burns, L.G.; Peterson, C.L.; Tamkun, J.W.; Mendel, D.B.; Crabtree, G.R.** The yeast SWI-SNF complex facilitates binding of a transcriptional activator to nucleosomal sites in vivo. *Mol Cell Biol* **17** (8) 1997. pp. 4811-4819.
- Cai, H.N.; Shen, P.** Effects of cis arrangement of chromatin insulators on enhancer-blocking activity. *Science* **291** (5503) 2001. pp. 493-495.
- Cairns, B.R.** Chromatin remodeling machines: similar motors, ulterior motives. *Trends Biochem Sci* **23** (1) 1998. pp. 20-25.
- Calzolari, R.; McMorrow, T.; Yannoutsos, N.; Langeveld, A.; Grosveld, F.** Deletion of a region that is a candidate for the difference between the deletion forms of hereditary persistence of fetal hemoglobin and delta beta-thalassemia affects beta- but not gamma-globin gene expression. *EMBO J* **18** (4) 1999. pp. 949-958.
- Cao, S.X.; Gutman, P.D.; Davie, H.P.; Schechter, A.N.** Identification of a transcriptional silencer in the 5'-flanking region of the human epsilon-globin gene. *Proc Natl Acad Sci U S A* **86** (14) 1989. pp. 5306-5309.
- Carruthers, L.M.; Hansen, J.C.** The core histone N termini function independently of linker histones during chromatin condensation. *J Biol Chem* **275** (47) 2000. pp. 37285-37290.
- Caterina, J.J.; Ryan, T.M.; Pawlik, K.M.; Palmiter, R.D.; Brinster, R.L.; Behringer, R.R.; Townes, T.M.** Human beta-globin locus control region: analysis of the 5' DNase I hypersensitive site HS 2 in transgenic mice. *Proc Natl Acad Sci U S A* **88** (5) 1991. pp. 1326-1330.
- Caterina, J.J.; Donze, D.; Sun, C.W.; Ciavatta, D.J.; Townes, T.M.** Cloning and functional characterization of LCR-F1: a bZIP transcription factor that activates erythroid-specific, human globin gene expression. *Nucleic Acids Res* **22** (12) 1994. pp. 2383-2391.
- Caterina, J.J.; Ciavatta, D.J.; Donze, D.; Behringer, R.R.; Townes, T.M.** Multiple elements in human beta-globin locus control region 5' HS 2 are involved in enhancer activity and position-independent, transgene expression. *Nucleic Acids Res* **22** (6) 1994. pp. 106-111.
- Cavalli, G.; Paro, R.** Epigenetic inheritance of active chromatin after removal of the main transactivator. *Science* **286** (5441) 1999. pp. 955-958.
- Chada, K.; Magram, J.; Costantini, F.** An embryonic pattern of expression of a human fetal globin gene in transgenic mice. *Nature* **319** (6055) 1986. pp. 685-689.
- Chan, F.; Robinson, J.; Browlie, A.** Characterization of adult alpha- and beta-globin genes in the zebrafish. *Blood* **89** (2) 1997. pp. 688-700.
- Chang, Y.L.; Peng, Y.H.; Pan, I.C.; Sun, D.S.; King, B.; Huang, D.H.** Essential role of Drosophila Hdac1 in homeotic gene silencing. *Proc Natl Acad Sci U S A* **98** (17) 2001. pp. 9730-9735.
- Charnay, P.; Treisman, R.; Mellon, P.; Chao, M.; Axel, R.; Maniatis, T.** Differences in human alpha- and beta-globin gene expression in mouse erythroleukemia cells: the role of intragenic sequences. *Cell* **38** (1) 1984. pp. 251-263.
- Chen, C.; Yang, T.P.** Nucleosomes are translationally positioned on the active allele and rotationally positioned on the inactive allele of the HPRT promoter. *Mol Cell Biol* **21** (22) 2001. pp. 7682-7695.
- Chen, D.; Ma, H.; Honh, H.; Koh, S.S.; Huang, S.M.; Schurter, B.T.; Aswad, D.W.; Stallcup, M.R.** Regulation of transcription by a protein methyltransferase. *Science* **284** (5423) 1999. pp. 2174-2177.
- Chen, H.; Lin, J.R.; Xie, W.; Wilpitz, D.; Evans, M.R.** Regulation of hormone-induced histone hyperacetylation and gene activation via acetylation of an acetylase. *Cell* **98** (5) 1999. pp. 675-686.
- Chen, S.; Corces, V.G.** The gypsy insulator of Drosophila affects chromatin structure in a directional manner. *Genetics* **159** (4) 2001. pp. 1649-1658.

- Chen, Z.J.; Pikaard, C.S.** Epigenetic silencing of RNA polymerase I transcription: a role for DNA methylation and histone modification in nucleolar dominance. *Genes Dev* **11** (16) 1997. pp. 2124-2136.
- Cheung, A.** Expansion of the allelic exclusion principle? *Science* **279** (5359) 1998. pp. 2067-2068.
- Cheung, P.; Allis, C.D.; Sassone-Corsi, P.** Signaling to chromatin through histone modifications. *Cell* **103** (2) 2000. pp. 263-271.
- Cheung, P.; Tanner, K.G.; Cheung, W.L.; Sassone-Corsi, P.; Denu, J.M.; Allis, C.D.** Synergistic coupling of histone H3 phosphorylation and acetylation in response to epidermal growth factor stimulation. *Mol Cell* **5** (6) 2000. pp. 905-915.
- Chi, T.; Carey, M.F.; Kakidani, H.; Roeder, R.G.** Assembly of the isomerized TFIIA-TFIID-TATA ternary complex is necessary and sufficient for gene activation. *Genes Dev* **10** (20) 1996. pp. 2540-2550.
- Cho, H.G.; Orphanides, G.; Sun, X.; Yang, X.J.; Ogryzko, V.; Lees, E.; Nakatani, Y.; Reinberg, D.** A human RNA polymerase II complex containing factors that modify chromatin structure. *Mol Cell Biol* **18** (9) 1998. pp. 5355-5363.
- Chodosh, L.A.; Fire, A.; Samuels, M.; Sharp, P.A.** 5,6-Dichloro-1-beta-D-ribofuranosylbenzimidazole inhibits transcription elongation by RNA polymerase II in vitro. *J Biol Chem* **264** (4) 1989. pp. 2250-2257.
- Choi, O.R.; Engel, J.D.** Developmental regulation of beta-globin gene switching. *Cell* **55** (1) 1988. pp. 17-26.
- Chung, J.H.; Whiteley, M.; Felsenfeld, G.** A 5' element of the chicken beta-globin domain serves as an insulator in human erythroid cells and protects against position effect in Drosophila. *Cell* **74** (3) 1993. pp. 505-514.
- Cirillo, L.A.; Zaret, K.S.** An early developmental transcription factor complex that is more stable on nucleosome core particles than on free DNA. *Mol Cell* **4** (6) 1999. pp. 961-969.
- Cirillo, L.A.; Lin, F.R.; Cuesta, I.; Friedman, D.; Jarnik, M.; Zaret, K.S.** Opening of compacted chromatin by early developmental transcription factors HNF3 (FoxA) and GATA-4. *Mol Cell* **9** (2) 2002. pp. 279-289.
- Clapier, C.R.; Langst, G.; Corona, D.F.; Becker, P.B.** Critical role for the histone H4 N terminus in nucleosome remodeling by ISWI. *Mol Cell Biol* **21** (3) 2001. pp. 875-883.
- Clark, A.R.; Docherty, K.** Negative regulation of transcription in eukaryotes. *Biochem J* **296** 1993. pp. 521-541.
- Clark, D.J.; Hill, C.S.; Martin, S.R.; Thomas, J.O.** Alpha-helix in the carboxy-terminal domains of histones H1 and H5. *EMBO J* **7** (1) 1988. pp. 69-75.
- Clark, D.J.; Kimura, T** Electrostatic mechanism of chromatin folding. *J Mol Biol* **211** (4) 1990. pp. 883-896.
- Clark, D.J.; O'Neill, L.P.; Turner, B.M.** Selective use of H4 acetylation sites in the yeast *Saccharomyces cerevisiae*. *Biochem J* **294** 1993. pp. 557-561.
- Cockerill, P.N.; Garrard, W.T.** Chromosomal loop anchorage of the kappa immunoglobulin gene occurs next to the enhancer in a region containing topoisomerase II sites. *Cell* **44** (2) 1986. pp. 273-282.
- Collins, F.S.; Weissman, S.M.** The molecular genetics of human hemoglobin. *Prog Nucleic Acid Res Mol Biol* **31** 1984. pp. 315-462.
- Collis, P.; Antoniou, M.; Grosveld, F.** Definition of the minimal requirements within the human beta-globin gene and the dominant control region for high level expression *EMBO J* **9** (1) 1990. pp. 233-240.
- Conaway, R.C.; Conaway, J.W.** General initiation factors for RNA polymerase II. *Annu Rev Biochem* **62** 1993. pp. 161-190.
- Cordes, V.G.; Geyer, P.K.** Interactions of retrotransposons with the host genome: the case of the gypsy element of Drosophila. *Trends Genet* **7** (3) 1991. pp. 86-90.
- Cornet, F.; Louarn, J.; Patte, J.; Louarn, J-M.** Restriction of the activity of the recombination site dif to a small zone of the Escherichia coli chromosome. *Genes Dev* **10** (9) 1996. pp. 1152-1161.
- Cornet, F.; Mortier, I.; Patte, J.; Louarn, J-M.** Plasmid pSC101 harbors a recombination site, psi, which is able to resolve plasmid multimers and to substitute for the analogous chromosomal Escherichia coli site dif. *J Bacteriol* **176** (11) 1994. pp. 3188-3195.
- Corona, D.F.; Langst, G.; Clapier, C.R.; Bonte, E.J.; Ferrari, S.; Tamkun, J.W.; Becker, P.B.** ISWI is an ATP-dependent nucleosome remodeling factor. *Mol Cell* **3** (2) 1999. pp. 239-245.
- Corral, J.; Lavenir, I.; Impey, H.; Warren, A.J.; Forster, A.; Larson, T.A.; Bell, S.; McKenzie, A.N.J.; King, G.; Rabbitts, T.H.** An Mll-AF9 fusion gene made by homologous recombination causes acute leukemia in chimeric mice: a method to create fusion oncogenes. *Cell* **85** (6) 1996. pp. 853-861.
- Cosma, M.P.; Tanaka, T.; Nasmyth, K.** Ordered recruitment of transcription and chromatin remodeling factors to a cell cycle- and developmentally regulated promoter *Cell* **97** (3) 1999. pp. 299-311.
- Cote, J.; Qiunn, J.; Workman, J.L.; Peterson, C.L.** Stimulation of GAL4 derivative binding to nucleosomal DNA by the yeast SWISNF complex. *Science* **265** (5168) 1994. pp. 53-60.
- Craddock, C.F.; Vyas, P.; Sharpe, J.A.; Ayyub, H.; Wood, W.G.; Higgs, D.R.** Contrasting effects of alpha and beta globin regulatory elements on chromatin structure may be related to their different chromosomal environments. *EMBO J* **14** (8) 1995. pp. 1718-1726.
- Crossley, M.; Whitelaw, E.; Perkins, A.; Williams, G.; Fujiwara, Y.; Orkin, S.H.** Isolation and characterization of the cDNA encoding BKLTF-2, a major CACCC-box-binding protein in erythroid cells and selected other cells. *Mol Cell Biol* **16** (4) 1996. pp. 1695-1705.
- Crossley, M.; Tsang, A.P.; Bieker, J.J.; Orkin, S.H.** Regulation of the erythroid Kruppel-like factor (EKLF) gene promoter by the erythroid transcription factor GATA-1. *J Biol Chem* **269** (22) 1994. pp. 15440-15444.
- Crotta, S.; Nicolis, S.; Ronchi, A.; Ottolenghi, S.; Ruzzi, L.; Shimada, Y.; Migliaccio, A.R.; Migliaccio, G.** Progressive inactivation of the expression of an erythroid transcriptional factor in GM- and G-CSF-dependent myeloid cell lines. *Nucleic Acids Res* **18** (23) 1990. pp. 6863-6869.
- Crouzet, J.; Naudin, L.; Orsini, C.; Vigne, E.; Ferrero, L.; Le Roux, A.; Benoit, P.; Latta, M.; Torrent, C.; Barnellic, D.; Denefle, P.; Mayaux, J-F; Perricaudet, M.; Yeh, P.** Recombinational construction in Escherichia coli of infectious adenoviral genomes. *Proc Natl Acad Sci U S A* **94** (4) 1997. pp. 1414-1419.
- Cryderman, D.E.; Cuaycong, M.H.; Elgin, S.C.R.; Wallrath, L.L.** Characterization of sequences associated with position-effect variegation at pericentric sites in Drosophila heterochromatin. *Chromosoma* **107** (5) 1998. pp. 277-285.
- Csordas, A.** On the biological role of histone acetylation. *Biochem J* **265** (1) 1990. pp. 23-38.
- Czernin, B.; Schotta, G.; Hulsman, B.B.; Brehm, A.; Becker, P.B.; Reuter, G.; Imhof, A.** Physical and functional association of SU(VAR)3-9 and HDAC1 in Drosophila. *EMBO rep* **2** (10) 2001. pp. 915-919.
- Dasso, M.; Dimitrov, S.; Wolffe, A.P.** Nuclear assembly is independent of linker histones. *Proc Natl Acad Sci U S A* **91** (26) 1994. pp. 12477-481.
- Davey, C.A.; Sargent, D.F.; Luger, K.; Maeder, A.W.; Richmond, T.J.** Solvent mediated interactions in the structure of the nucleosome core particle at 1.9 Å resolution. *J Mol Biol* **319** (5) 2002. pp. 1097-1113.
- de Boer, E.; Antoniou, M.; Mignotte, V.; Wall, L.; Grosveld, F.** The human beta-globin promoter, nuclear protein factors and erythroid specific induction of transcription. *EMBO J* **7** (13) 1988. pp. 4203-4212.
- De Lange, R.J.; Farnbrough, D.M.; Smith, E.L.; Bonner, J.** Identification of epsilon-N-methyllysine in *Spirillum serpens* flagella and of epsilon-N-dimethyllysine in *Salmonella typhimurium* flagella. *J Biol Chem* **244** (1) 1969. pp. 319-334.
- de Villiers, J.; Olson, L.; Banerji, J.; Schaffner, W.** *Cold Spring Harb. Symp. Quant. Biol* 1983. pp. 911-919.
- Deisseroth, A.; Velez, R.; Nienhuis, A.W.** Hemoglobin synthesis in somatic cell hybrids: independent segregation of the human alpha- and beta-globin genes. *Science* **191** (4233) 1976. pp. 1262-1263.

- Deisseroth, A.; Nienhuis, A.W.; Turner, P.; Velez, R.; Anderson, W.I.; Ruddle, F.; Lawrence, J.; Creagan, R.; Kuchelapati, R.** Localization of the human alpha-globin structural gene to chromosome 16 in somatic cell hybrids by molecular hybridization assay. *Cell* **12** (1) 1977. pp. 205-218.
- Deisseroth, A.; Nienhuis, A.W.; Lawrence, J.; Giles, R.; Turner, P.; Ruddle, F.H.** Chromosomal localization of human beta globin gene on human chromosome 11 in somatic cell hybrids. *Proc Natl Acad Sci U S A* **75** (3) 1978. pp. 1456-1460.
- Dhalluin, C.; Carlson, J.E.; Zeng, L.; He, C.; Aggerwal, A.; Zhou, M.** Structure and ligand of a histone acetyltransferase bromodomain. *Nature* **399** (6735) 1999. pp. 491-496.
- Dhar, V.; Nandi, A.; Schildkraut, C.L.; Skoultschi, A.** Erythroid-specific nuclease-hypersensitive sites flanking the human beta-globin domain. *Mol Cell Biol* **10** (8) 1990. pp. 4324-4333.
- Dickerson, R.E.; Geis, I.** *Hemoglobin: Structure, function, evolution and pathology* 1983. pp. ?-?.
- Dillon, N.; Grosveld, F.** Human gamma-globin genes silenced independently of other genes in the beta-globin locus. *Nature* **350** (6315) 1991. pp. 252-254.
- Dillon, N.; Trimborn, T.; Strouboulis, J.; Fraser, P.; Grosveld, F.** The effect of distance on long-range chromatin interactions. *Mol Cell* **1** (1) 1997. pp. 131-139.
- Dillon, N.; Grosveld, F.** Transcriptional regulation of multigene loci: multilevel control. *Trends Genet* **9** (4) 1993. pp. 134-137.
- Dong, J.M.; Lim, L.** The human neuronal alpha 1-chimaerin gene contains a position-dependent negative regulatory element in the first exon. *Neurochem Res* **21** (9) 1996. pp. 1023-1030.
- Donze, D.; Jeancake, P.H.; Townes, T.M.** Activation of delta-globin gene expression by erythroid Kruppel-like factor: a potential approach for gene therapy of sickle cell disease. *Blood* **88** (10) 1996. pp. 4051-4057.
- Donze, D.; Townes, T.M.; Bieker, J.J.** Role of erythroid Kruppel-like factor in human gamma- to beta-globin gene switching. *J Biol Chem* **270** (4) 1995. pp. 1955-1959.
- Dorsett, D.** Distance-independent inactivation of an enhancer by the suppressor of Hairy-wing DNA-binding protein of Drosophila. *Genetics* **134** (4) 1993. pp. 1135-1144.
- Dower, W.J.; Miller, J.F.; Ragsdale, C.W.** High efficiency transformation of *E. coli* by high voltage electroporation. *Nucleic Acids Res* **16** (13) 1988. pp. 6127-6145.
- Driscoll, M.C.; Dobkin, C.S.; Alter, B.P.** Gamma delta beta-thalassemia due to a de novo mutation deleting the 5' beta-globin gene activation-region hypersensitive sites. *Proc Natl Acad Sci U S A* **86** (19) 1989. pp. 7470-7474.
- Duan, Z.J.; Stamatoyannopoulos, G.; Li, Q.** Role of NF-Y in in vivo regulation of the gamma-globin gene. *Mol Cell Biol* **21** (9) 2001. pp. 3083-3095.
- Duff, K.; Huxley, C.** Targeting mutations to YACs by homologous recombination. *Methods Mol Biol* **54** 1996. pp. 187-198.
- Dynan, W.** Modularity in promoters and enhancers. *Cell* **58** (1) 1989. pp. 1-4.
- Dynlach, B.D.; Hoey, T.; Tjian, R.** Isolation of coactivators associated with the TATA-binding protein that mediate transcriptional activation. *Cell* **66** (3) 1991. pp. 563-576.
- Eberharter, A.; Ferrari, S.; Langst, G.; Straub, T.; Imhof, A.; Varga-Weisz, P.D.; Wilm, M.; Becker, P.B.** Acf1, the largest subunit of CHRAC, regulates ISWI-induced nucleosome remodelling. *EMBO J* **20** (14) 2001. pp. 3781-3788.
- Eden, S.; Hashishony, T.; Keshet, I.; Cedar, H.; Thorne, A.W.** DNA methylation models histone acetylation. *Nature* **394** (6696) 1998. pp. 842-842.
- Efstratiadis, A.; Posakony, J.W.; Maniatis, T.; Lawn, R.M.; O'Connell, C.; Spritz, R.A.; de Riel, J.K.; Forget, B.G.; Weissman, S.M.; Slifstrom, J.L.; Blechl, E.A.; Smithies, O.; Baralle, F.E.; Shoulders, C.C.; Proudfoot, N.J.** The structure and evolution of the human beta-globin gene family. *Cell* **21** (3) 1980. pp. 653-668.
- Eikbush, T.H.; Moudrianakis, E.N.** The histone core complex: an octamer assembled by two sets of protein-protein interactions. *Biochemistry* **17** (23) 1978. pp. 4955-4964.
- Eisenfeld, K.; Candau, R.; Truss, M.; Breato, M.** Binding of NF1 to the MMTV promoter in nucleosomes: influence of rotational phasing, translational positioning and histone H1. *Nucleic Acids Res* **25** (18) 1997. pp. 3733-3742.
- Eissenberg, J.C.; Elgin, S.C.R.** Boundary functions in the control of gene expression. *Trends Genet* **7** (10) 1991. pp. 335-340.
- Eissenberg, J.C.; James, T.C.; Foster-Hartnett, D.M.; Hartnett, T.; Ngan, V.; Elgin, S.C.** Mutation in a heterochromatin-specific chromosomal protein is associated with suppression of position-effect variegation in *Drosophila melanogaster*. *Proc Natl Acad Sci U S A* **87** (24) 1990. pp. 9923-9927.
- Eissenberg, J.C.; Morris, G.D.; Reuter, G.; Hartnett, T.** The heterochromatin-associated protein HP-1 is an essential protein in *Drosophila* with dosage-dependent effects on position-effect variegation. *Genetics* **87** (131) 1992. pp. 9923-9927.
- Ekwall, K.; Olson, T.; Turner, B.M.; Cranston, G.; Allshire, R.C.** Transient inhibition of histone deacetylation alters the structural and functional imprint at fission yeast centromeres. *Cell* **91** (7) 1997. pp. 1021-1032.
- Ellis, J.; Talbot, D.; Dillon, N.; Grosveld, F.** Synthetic human beta-globin 5'HS2 constructs function as locus control regions only in multicopy transgene concatamers. *EMBO J* **12** (1) 1993. pp. 127-134.
- Ellis, J.; Tan-Un, K.C.; Harper, A.; Michalovich, D.; Yannoutsos, N.; Philipsen, S.; Grosveld, F.** A dominant chromatin-opening activity in 5' hypersensitive site 3 of the human beta-globin locus control region. *EMBO J* **15** (3) 1996. pp. 562-568.
- Elnitski, L.; Li, J.; Noguchi, C.T.; Miller, W.; Hardison, R.** A negative cis-element regulates the level of enhancement by hypersensitive site 2 of the beta-globin locus control region. *J Biol Chem* **276** (9) 2001. pp. 6289-6298.
- Elowitz, M.B.; Levine, A.J.; Siggia, E.D.; Swain, P.S.** Stochastic gene expression in a single cell. *Science* **297** (5584) 2002. pp. 1183-1186.
- Emerson, B.M.; Lewis, C.D.; Felsenfeld, G.** Interaction of specific nuclear factors with the nuclease-hypersensitive region of the chicken adult beta-globin gene: nature of the binding domain. *Cell* **41** (1) 1985. pp. 21-30.
- Enver, T.; Ebens, A.J.; Forrester, W.C.; Stamatoyannopoulos, G.** The human beta-globin locus activation region alters the developmental fate of a human fetal globin gene in transgenic mice. *Proc Natl Acad Sci U S A* **86** (18) 1989. pp. 7033-7037.
- Enver, T.; Raich, N.; Ebens, A.J.; Papayannopoulou, T.; Costantini, F.; Stamatoyannopoulos, G.** Developmental regulation of human fetal-to-adult globin gene switching in transgenic mice. *Nature* **344** (6264) 1990. pp. 309-313.
- Epner, E.; Rifkin, R.A.; Marks, P.A.** Replication of alpha and beta globin DNA sequences occurs during early S phase in murine erythroleukemia cells. *Proc Natl Acad Sci U S A* **78** (5) 1981. pp. 3058-3062.
- Epner, E.; Reik, A.; Cimbara, D.; Telling, A.; Bender, M.A.; Fiering, A.; Enver, T.; Martin, D.I.; Kennedy, M.; Keller, G.; Groudine, M.** The beta-globin LCR is not necessary for an open chromatin structure or developmentally regulated transcription of the native mouse beta-globin locus. *Mol Cell* **2** (4) 1998. pp. 447-455.
- Farace, M.G.; Brown, B.A.; Raschella, G.; Alexander, J.; Cambari, R.; Fantoni, A.; Hardies, S.C.; Hutchison III, C.A.; Edgell, M.H.** The mouse beta h1 gene codes for the z chain of embryonic hemoglobin. *J Biol Chem* **259** (11) 1984. pp. 7123-7128.
- Farrell, C.M.; Grinberg, A.; Huang, S.P.** A large upstream region is not necessary for gene expression or hypersensitive site formation at the mouse beta-globin locus. *Proc Natl Acad Sci U S A* **97** (26) 2000. pp. 14554-14559.
- Feinberg, A.W.; Vogelstein, B.** A technique for radiolabeling DNA restriction endonuclease fragments to high specific activity. *Anal Biochem* **132** (1) 1983. pp. 6-13.

- Feingold, E.A.; Forget, B.G.** The breakpoint of a large deletion causing hereditary persistence of fetal hemoglobin occurs within an erythroid DNA domain remote from the beta-globin gene cluster. *Blood* **74** (6) 1989. pp. 2178-2186.
- Felsenfeld, G.** Chromatin unfolds. *Cell* **86** (1) 1996. pp. 13-19.
- Feng, W.C.; Southwood, C.M.; Bieker, J.J.** Analyses of beta-thalassemia mutant DNA interactions with erythroid Kruppel-like factor (EKLF), an erythroid cell-specific transcription factor. *J Biol Chem* **269** (2) 1994. pp. 1493-1500.
- Fessas, P.; Stamatoyannopoulos, G.** Hereditary Persistence of foetal hemoglobin in Greece : a study and a comparison. *Blood* **24** 1964. pp. 223-223.
- Festenstein, R.; Tolaini, M.; Corbella, P.; Mamalaki, C.; Parrington, J.; Fox, M.; Miliou, A.; Jones, M.; Kioussis, D.** Locus control region function and heterochromatin-induced position effect variegation. *Science* **271** (5252) 1996. pp. 123-125.
- Festenstein, R.; Kioussis, D.** Locus control regions and epigenetic chromatin modifiers. *Curr Opin Genetics Dev* **10** (2) 2000. pp. 199-203.
- Fiering, S.; Epner, E.; Robinson, K.; Zhuang, Y.; Telling, A.; Hu, M.; Martin, D.I.K.; Enver, T.; Ley, T.J.; Groudine, M.** Targeted deletion of 5'HS2 of the murine beta-globin LCR reveals that it is not essential for proper regulation of the beta-globin locus. *Genes Dev* **9** (18) 1995. pp. 2203-2213.
- Fiering, S.; Northrop, J.P.; Nolan, G.P.; Mattila, P.S.; Crabtree, G.R.; Herzenberg, L.A.** Single cell assay of a transcription factor reveals a threshold in transcription activated by signals emanating from the T-cell antigen receptor. *Genes Dev* **4** 1990. pp. 1823-1834.
- Fiering, S.; Whitelaw, E.; Martin, D.I.K.** To be or not to be active: the stochastic nature of enhancer function. *Bioessays* **22** 2000. pp. 381-387.
- Filipe, A.; Li, Q.; Deveaux, S.; Godin, I.; Romeo, P.H.; Stamatoyannopoulos, G.; Mignotte, V.** Regulation of embryonic fetal globin genes by nuclear hormone receptors: a novel perspective on hemoglobin switching. *EMBO J* **18** (3) 1999. pp. 687-687.
- Fischel-Ghodsian, N.; Nicholls, R.D.; Higgs, D.R.** Long range genome structure around the human alpha-globin complex analysed by PFGE. *Nucleic Acids Res* **15** (15) 1987. pp. 9215-9225.
- Fischle, W.; Emiliani, S.; Hendzel, M.L.; Nagase, T.; Nomura, N.; Voelter, W.; Verdin, E.** A new family of human histone deacetylases related to Saccharomyces cerevisiae HDA1p. *J Biol Chem* **274** (17) 1999. pp. 11713-11720.
- Fletcher, T.M.; Hansen, J.C.** The nucleosomal array: structurefunction relationships. *Crit Rev Eukaryoti Gene Expr* **6** 1996. pp. 88-91.
- Flint, J.; Thomas, K.; Micklem, G.; Raynham, H.; Clark, K.; Doggett, N.A.; Higgs, D.R.** The relationship between chromosome structure and function at a human telomeric region. *Nature Genet* **15** (3) 1997. pp. 252-257.
- Forrester, W.C.; Takegawa, S.; Papayannopoulou, T.; Stamatoyannopoulos, G.; Groudine, M.** Evidence for a locus activation region: the formation of developmentally stable hypersensitive sites in globin-expressing hybrids. *Nucleic Acids Res* **15** (24) 1987. pp. 10159-10177.
- Forrester, W.C.; Thompson, C.; Elder, J.T.; Groudine, M.** A developmentally stable chromatin structure in the human beta-globin gene cluster. *Proc Natl Acad Sci U S A* **83** (5) 1986. pp. 1359-1363.
- Forrester, W.C.; Epner, E.; Driscoll, M.C.; Enver, T.; Brice, M.; Papayannopoulou, T.; Groudine, M.** A deletion of the human beta-globin locus activation region causes a major alteration in chromatin structure and replication across the entire beta-globin locus. *Genes Dev* **4** (10) 1990. pp. 1637-1649.
- Forsberg, E.C.; Bresnick, E.H.** Histone acetylation beyond promoters: long-range acetylation patterns in the chromatin world. *Bioessays* **23** (9) 2001. pp. 820-830.
- Francastel, C.; Walters, M.C.; Groudine, M.; Martin, D.I.** A functional enhancer suppresses silencing of a transgene and prevents its localization close to centrometric heterochromatin. *Cell* **99** (3) 1999. pp. 259-269.
- Francis, N.J.; Saurin, A.J.; Shao, Z.; Kingston, R.E.** Reconstitution of a functional core polycomb repressive complex. *Mol Cell* **8** (3) 2001. pp. 545-556.
- Fraser, P.; Grosveld, F.** Locus control regions, chromatin activation and transcription. *Curr Opin Cell Biol* **10** (3) 1998. pp. 361-365.
- Fraser, P.; Hurst, J.; Collis, P.; Grosveld, F.** DNasel hypersensitive sites 1, 2 and 3 of the human beta-globin dominant control region direct position-independent expression. *Nucleic Acids Res* **18** (12) 1990. pp. 3503-3508.
- Fraser, P.; Pruzina, S.; Antoniou, M.; Grosveld, F.** Each hypersensitive site of the human beta-globin locus control region confers a different developmental pattern of expression on the globin genes. *Genes Dev* **7** (1) 1993. pp. 106-113.
- Fujiwara, Y.; Browne, C.P.; Cunniff, K.; Goff, S.C.; Orkin, S.H.** Arrested development of embryonic red cell precursors in mouse embryos lacking transcription factor GATA-1. *Proc Natl Acad Sci U S A* **93** (22) 1996. pp. 12355-12358.
- Furst, A.; Brown, E.H.; Braunstein, J.D.; Schildkraut, C.L.** alpha-Globulin sequences are located in a region of early-replicating DNA in murine erythroleukemia cells. *Proc Natl Acad Sci U S A* **78** (2) 1981. pp. 1023-1027.
- Furukawa, T.; Navas, P.A.; Josephson, B.M.; Peterson, K.R.; Papayannopoulou, T.; Stamatoyannopoulos, G.** Coexpression of epsilon, G gamma and A gamma globin mRNA in embryonic red blood cells from a single copy beta-YAC transgenic mouse. *Cells Blood Cells Mol Dis* **21** (2) 1995. pp. 168-178.
- Gaensler, K.M.; Kitamura, M.; Kan, Y.W.** Germ-line transmission and developmental regulation of a 150-kb yeast artificial chromosome containing the human beta-globin locus in transgenic mice. *Proc Natl Acad Sci U S A* **90** (23) 1993. pp. 11381-11385.
- Galy, V.; Olivo-Marin, J.C.; Scherthan, H.; Doye, V.; Rascalou, N.; Nehrbass, U.** Nuclear pore complexes in the organization of silent telomeric chromatin. *Nature* **403** (6765) 2000. pp. 108-112.
- Gasser, S.M.** Positions of potential: nuclear organization and gene expression. *Cell* **104** (5) 2001. pp. 639-642.
- Georgakopoulos, T.; Thireos, G.** Two distinct yeast transcriptional activators require the function of the GCN5 protein to promote normal levels of transcription. *EMBO J* **11** (11) 1992. pp. 4145-4152.
- Gerasimova, T.I.; Corces, V.G.** Polycomb and trithorax group proteins mediate the function of a chromatin insulator. *Cell* **92** (4) 1998. pp. 511-521.
- Geyer, P.K.** The role of insulator elements in defining domains of gene expression. *Curr Opin Genetics Dev* **7** (2) 1997. pp. 242-248.
- Giglioli, B.; Casini, C.; Mantovani, R.; Merli, S.; Comi, P.; Ottolenghi, S.; Saglio, G.; Camaschella, C.; Mazza, U.** A molecular study of a family with Greek hereditary persistence of fetal hemoglobin and beta-thalassemia. *EMBO J* **3** (11) 1984. pp. 2641-2645.
- Gillemans, N.; Tewari, R.; Lindeboom, F.; Rottier, R.; de Wit, T.; Wijgerde, M.; Grosveld, F.; Philipsen, S.** Altered DNA-binding specificity mutants of EKLF and Sp1 show that EKLF is an activator of the beta-globin locus control region in vivo. *Genes Dev* **12** (18) 1998. pp. 2863-2873.
- Gindhart, J.G.; Kaufman, T.C.** Identification of Polycomb and trithorax group responsive elements in the regulatory region of the Drosophila homeotic gene Sex combs reduced. *Genetics* **139** (2) 1995. pp. 797-814.
- Gong, Q.H.; Dean, A.** Enhancer-dependent transcription of the epsilon-globin promoter requires promoter-bound GATA-1 and enhancer-bound AP-1NF-E2. *Annu Rev Cell Biol* **13** (2) 1993. pp. 911-917.
- Gong, Q.H.; Stern, J.; Dean, A.** Transcriptional role of a conserved GATA-1 site in the human epsilon-globin gene promoter. *Mol Cell Biol* **11** (5) 1991. pp. 2558-2566.
- Gong, Q.H.; McDowell, J.C.; Dean, A.** Essential role of NF-E2 in remodeling of chromatin structure and transcriptional activation of the epsilon-globin gene in vivo by 5' hypersensitive site 2 of the beta-globin locus control region. *Mol Cell Biol* **16** (11) 1996. pp. 6055-6064.
- Goodrich, J.A.; Tjian, R.** Transcription factors IIE and IIH and ATP hydrolysis direct promoter clearance by RNA polymerase II. *Cell* **77** (1) 1994. pp. 145-156.

- Goto, T.; Monk, M.** Regulation of X-chromosome inactivation in development in mice and humans. *Microbiol Mol Biol Rev* **62** (2) 1998. pp. 362-378.
- Gotta, M.; Laroche, T.; Formenton, A.; Maillet, L.; Scherthan, H.; Gasser, S.M.** The clustering of telomeres and colocalization with Rap1, Sir3, and Sir4 proteins in wild-type *Saccharomyces cerevisiae*. *J Cell Biol* **134** (6) 1996. pp. 1349-1363.
- Grant, P.A.; Berger, S.L.** Histone acetyltransferase complexes. *Sem Cell Dev Biol* **10** (2) 1999. pp. 169-177.
- Greaves, D.R.; Wilson, F.D.; Lang, G.; Kioussis, D.** Human CD2 3'-flanking sequences confer high-level, T cell-specific, position-independent gene expression in transgenic mice. *Cell* **56** (6) 1989. pp. 979-986.
- Green, E.D.; Reithman, H.C.; Dutchik, J.E.; Olson, M.V.** Detection and characterization of chimeric yeast artificial-chromosome clones. *Genomics* **11** (3) 1991. pp. 658-669.
- Gregory, P.D.; Schmid, A.; Zavari, M.; Munsterkotter, M.; Horz, W.** Chromatin remodelling at the PHO8 promoter requires SWI-SNF and SAGA at a step subsequent to activator binding. *EMBO J* **18** (22) 1999. pp. 6407-6414.
- Gribnau, J.; de Boer, E.; Trimborg, T.; Wiijerde, M.; Milot, E.; Grosveld, F.; Fraser, P.** Chromatin interaction mechanism of transcriptional control in vivo. *EMBO J* **17** (20) 1998. pp. 6020-6027.
- Gribnau, J.; Diderich, K.; Pruzina, S.; Calzolari, R.; Fraser, F.** Intergenic transcription and developmental remodeling of chromatin subdomains in the human beta-globin locus. *Mol Cell* **5** (2) 2000. pp. 377-386.
- Gross, D.S.; Garrard, W.T.** Nuclease hypersensitive sites in chromatin. *Annu Rev Biochem* **57** 1988. pp. 159-197.
- Grosveld, F.; van Assendelft, G.B.; Greaves, D.R.; Kollia, G.** Position-independent, high-level expression of the human beta-globin gene in transgenic mice. *Cell* **51** (6) 1987. pp. 975-985.
- Grosveld, F.** Activation by locus control regions? *Curr Opin Genetics Dev* **9** (2) 1999. pp. 152-157.
- Groudine, M.; Kohwi-Shigematsu, T.; Gelinas, R.** Human fetal to adult hemoglobin switching: changes in chromatin structure of the beta-globin gene locus. *Proc Natl Acad Sci U S A* **80** (24) 1983. pp. 7551-7555.
- Grozinger, C.M.; Hassig, C.A.; Schreiber, S.L.** Three proteins define a class of human histone deacetylases related to yeast Hda1p. *Proc Natl Acad Sci U S A* **96** (9) 1999. pp. 4868-4873.
- Grunstein, M.; Durrin, L.K.; Man, R.K.; Fisher-Adams, G.; Johnson, L.M.** Transcriptional regulation 1992. pp. 1295-1315.
- Grunstein, M.** Yeast heterochromatin: regulation of its assembly and inheritance by histones. *Cell* **93** (3) 1998. pp. 325-328.
- Gu, W.; Roeder, R.G.** Activation of p53 sequence-specific DNA binding by acetylation of the p53 C-terminal domain. *Cell* **90** (4) 1997. pp. 595-606.
- Gui, C.Y.; Dean, A.** Acetylation of a specific promoter nucleosome accompanies activation of the epsilon-globin gene by beta-globin locus control region HS2. *Mol Cell Biol* **21** (4) 2001. pp. 1155-1163.
- Gumucio, D.L.; Shelton, D.A.; Bailey, W.J.; Slichtom, J.L.; Goodman, M.** Phylogenetic footprinting reveals unexpected complexity in trans factor binding upstream from the epsilon-globin gene. *Proc Natl Acad Sci U S A* **90** (13) 1993. pp. 6018-6022.
- Gumucio, D.L.; Rood, K.L.; Gray, T.A.; Riordan, M.F.; Sartor, C.I.; Collins, F.S.** Nuclear proteins that bind the human gamma-globin gene promoter: alterations in binding produced by point mutations associated with hereditary persistence of fetal hemoglobin. *Mol Cell Biol* **8** (12) 1988. pp. 5310-5322.
- Hagstrom, K.; Muller, M.; Schedl, P.** A Polycomb and GAGA dependent silencer adjoins the Fab-7 boundary in the Drosophila bithorax complex. *Genetics* **146** (4) 1997. pp. 1365-1380.
- Hamiche, A.; Sandaltzopoulos, R.; Gdula, D.A.; Wu, C.** ATP-dependent histone octamer sliding mediated by the chromatin remodeling complex NURF. *Cell* **97** (7) 1999. pp. 833-842.
- Hamilton, C.M.; Aldea, M.; Washburn, B.K.; Babitzke, P.; Kushner, S.R.** New method for generating deletions and gene replacements in Escherichia coli. *J Bacteriol* **171** (9) 1989. pp. 4617-4622.
- Hanscombe, O.; Vidal, M.; Kaeda, J.; Luzzatto, L.; Greaves, D.R.; Grosveld, F.** High-level, erythroid-specific expression of the human alpha-globin gene in transgenic mice and the production of human hemoglobin in murine erythrocytes. *Genes Dev* **3** (10) 1989. pp. 1572-1581.
- Hanscombe, O.; Whyatt, D.; Fraser, P.; Yannoutsos, N.; Greaves, D.; Dillon, N.; Grosveld, F.** Importance of globin gene order for correct developmental expression. *Genes Dev* **5** (8) 1991. pp. 1387-1394.
- Hardison, R.C.** A brief history of hemoglobins: plant, animal, protist, and bacteria. *Proc Natl Acad Sci U S A* **93** (12) 1996. pp. 5675-5679.
- Hartzog, G.A.; Myers, R.M.** Discrimination among potential activators of the beta-globin CACCC element by correlation of binding and transcriptional properties. *Mol Cell Biol* **13** (1) 1993. pp. 44-56.
- Haswell, E.S.; O Shea, E.K.** An in vitro system recapitulates chromatin remodeling at the PHO5 promoter. *Mol Cell Biol* **19** (4) 1999. pp. 2817-2827.
- Haupt, Y.; Alexander, W.S.; Barri, G.; Klinken, S.P.; Adams, J.M.** Novel zinc finger gene implicated as myc collaborator by retrovirally accelerated lymphomagenesis in E mu-myc transgenic mice. *Cell* **65** (5) 1991. pp. 753-763.
- Hayes, J.J.; Tullius, T.D.; Wolffe, A.P.** The structure of DNA in a nucleosome. *Proc Natl Acad Sci U S A* **87** (19) 1990. pp. 7405-7409.
- Hayes, J.J.; Clark, D.J.; Wolffe, A.P.** Histone contributions to the structure of DNA in the nucleosome. *Proc Natl Acad Sci U S A* **88** (15) 1991. pp. 6829-6833.
- Hebbes, T.R.; Clayton, A.L.; Thorne, A.W.; Crane-Robinson, C.** Core histone hyperacetylation co-maps with generalized DNase I sensitivity in the chicken beta-globin chromosomal domain. *EMBO J* **13** (8) 1994. pp. 1823-1830.
- Heintz, E - Botanik** **69** 1928. pp. 762-818.
- Held, W.; Kunz, B.; Ioannidis, V.; Lowin-Kropf, B.** Mono-allelic Ly49 NK cell receptor expression. *Semin Immunol* **11** (5) 1999. pp. 349-355.
- Henikoff, S.** Nuclear organization and gene expression: homologous pairing and long-range interactions. *Curr Opin Cell Biol* **9** (3) 1997. pp. 388-395.
- Herendeen, D.R.; Kassavetis, G.A.; Geiduschek, E.P.** A transcriptional enhancer whose function imposes a requirement that proteins track along DNA. *Science* **256** (5061) 1992. pp. 1298-1303.
- Herr, W.** Transcriptional regulation 1992. pp. ?-?.
- Higgs, D.; Wood, W.G.; Jarman, A.; Sharpe, J.; Lida, J.; Pretorius, J.M.; Ayyub, H.** A major positive regulatory region located far upstream of the human alpha-globin gene locus. *Genes Dev* **4** (9) 1990. pp. 1588-1601.
- Higgs, D.** Do LCRs open chromatin domains? *Cell* **95** (3) 1998. pp. 299-302.
- Higgs, D.R.; Sharpe, J.A.; Wood, W.G.** Understanding alpha globin gene expression: a step towards effective gene therapy. *Semin Hematol* **35** (2) 1998. pp. 93-104.
- Hollander, G.A.; Zuklys, S.; Morel, C.; Mizoguchi, E.; Mobisson, K.; Simpson, S.; Terhorst, C.; Wishart, W.; Golan, D.E.; Bhan, A.K.; Burakoff, S.J.** Monoallelic expression of the interleukin-2 locus. *Science* **279** (5359) 1998. pp. 2118-2121.
- Holstege, F.C.; Jennings, E.G.; Wyryck, J.J.; Lee, T.I.; Hengartner, C.J.; Green, M.R.; Golub, T.R.; Lander, E.S.; Young, R.A.** Dissecting the regulatory circuitry of a eukaryotic genome. *Cell* **95** (5) 1998. pp. 717-728.
- Horikoshi, M.; Carey, M.F.; Kakidani, H.; Roeder, R.G.** Mechanism of action of a yeast activator: direct effect of GAL4 derivatives on mammalian TFIID-promoter interactions. *Cell* **54** (5) 1988. pp. 665-669.

- Hosbach, H.A.; Wyler, T.; Weber, R.** The Xenopus laevis globin gene family: chromosomal arrangement and gene structure. *Cell* **32** (1) 1983. pp. 45-53.
- Hu-Li, J.; Pannetier, C.; Guo, L.; Lohning, M.; Gu, H.; Watson, C.; Assenmacher, M.; Radbruch, A.; Paul, W.E.** Regulation of expression of IL-4 alleles: analysis using a chimeric GFPIL-4 gene. *Immunity* **14** (1) 2001. pp. 1-11.
- Huang, H.C.; Schwyter, D.H.; Shirokawa, J.M.; Courey, A.J.** The interplay between multiple enhancer and silencer elements defines the pattern of decapentaplegic expression. *Genes Dev* **7** (4) 1993. pp. 694-704.
- Huang, Y.; Liu, D.P.; Wu, L.; Li, T.C.; Feng, D.X.; Liang, C.C.** Proper developmental control of human globin genes reproduced by transgenic mice containing a 160-kb BAC carrying the human beta-globin locus. *Blood Cells Mol Dis* **26** (6) 2000. pp. 598-610.
- Huehns, F.; Dance, N.; Beaven, G.H.; Keil, J.V.; Hecht, F.; Motulsky, A.G.** - *Nature* **201** 1964. pp. 1095-?.
- Hug, B.; Moon, A.; Ley, T.** Structure and function of the murine beta-globin locus control region 5' HS-3. *Nucleic Acids Res* **20** (21) 1992. pp. 5771-5778.
- Hug, B.A.; Wesseschmidt, R.L.; Fiering, S.; Bender, M.A.; Epner, E.; Groudine, M.; Ley, T.J.** Analysis of mice containing a targeted deletion of beta-globin locus control region 5' hypersensitive site 3. *Mol Cell Biol* **16** (6) 1996. pp. 2906-2912.
- Hughes, S.; Stubblefield, E.; Payvar, F.; Engel, J.D.; Dodgson, J.B.; Cordell, B.; Schmike, R.T.; Varmus, H.E.** Gene localization by chromosome fractionation: globin genes are on at least two chromosomes and three estrogen-inducible genes are on three chromosomes. *Proc Natl Acad Sci U S A* **76** (3) 1979. pp. 1348-1352.
- Huisman, T.H.; Carver, M.F.** The beta- and delta-thalassemia repository (Ninth Edition: Part I). *Hemoglobin* **22** (2) 1998. pp. 169-195.
- Huisman, T.H.; Schroeder, W.A.; Efremov, G.D.; Duma, H.; Mladenovski, B.; Hyman, C.B.; Rachmilewitz, E.A.; Bouver, N.; Miller, A.; Brodie, A.; Shelton, J.R.; Apell, G.** The present status of the heterogeneity of fetal hemoglobin in beta-thalassemia: an attempt to unify some observations in thalassemia and related conditions. *Ann NY Acad Sci* **232** (0) 1974. pp. 107-124.
- Hume, D.A.** Probability in transcriptional regulation and its implication for leukocyte differentiation and inducible gene expression *Blood* **96** 2000. pp. 2323-2328.
- Humphries, R.K.; Ley, T.; Turner, P.; Moulton, A.D.; Nienhuis, A.W.** Differences in human alpha-, beta- and delta-globin gene expression in monkey kidney cells. *Cell* **30** (1) 1982. pp. 173-183.
- Hunter, T.; Karin, M.** The regulation of transcription by phosphorylation. *Cell* **70** (3) 1992. pp. 375-387.
- Iguchi-Ariga, S.M.; Schaffner, W.** CpG methylation of the cAMP-responsive enhancer/promoter sequence TGACGTCA abolishes specific factor binding as well as transcriptional activation. *Genes Dev* **3** (5) 1989. pp. 612-619.
- Ikuta, T.; Papayannopoulou, T.; Stamatoyannopoulos, G.; Kan, Y.W.** Globin gene switching. In vivo protein-DNA interactions of the human beta-globin locus in erythroid cells expressing the fetal or the adult globin gene program. *J Biol Chem* **271** (24) 1996. pp. 14082-14091.
- Ikuta, T.; Kan, Y.W.** In vivo protein-DNA interactions at the beta-globin gene locus. *Proc Natl Acad Sci U S A* **88** (22) 1991. pp. 10188-10192.
- Imai, S.; Armstrong, C.M.; Kaeberlein, M.; Guarente, L.** Transcriptional silencing and longevity protein Sir2 is an NAD-dependent histone deacetylase. *Nature* **403** (6771) 2000. pp. 795-800.
- Imam, A.; Patrinos, G.; de Krom, M.; Bottardi, S.; Janssens, R.; Katsantoni, E.; Wai, A.; Sheratt, D.; Grosfeld, F.** Modification of human beta-globin locus PAC clones by homologous recombination in Escherichia coli. *Nucleic Acids Res* **28** (12) 2000. pp. E65-E65.
- Ioannou, P.; De Jong, P.** *Current Protocols in Human Genetics*. John 1996. pp. ?-?.
- Ioannou, P.A.; Amemiya, C.T.; Garnes, K.J.; Kroisel, P.M.; Shizuya, H.; Chen, C.; Batzer, B.A.; de Jong, P.J.** A new bacteriophage P1-derived vector for the propagation of large human DNA fragments. *Nature Genet* **6** (1) 1994. pp. 84-89.
- Ito, E.; Toki, T.; Ishihara, H.; Ohtani, H.; Gu, L.; Yoloyama, M.; Engel, J.D.; Yamamoto, M.** Erythroid transcription factor GATA-1 is abundantly transcribed in mouse testis. *Nature* **362** (6419) 1993. pp. 466-468.
- Ito, T.; Bulger, M.; Pazin, M.J.; Kobayashi, R.; Kadonaga, J.T.** ACF, an ISWI-containing and ATP-utilizing chromatin assembly and remodeling factor. *Cell* **90** (1) 1997. pp. 145-155.
- Ito, T.; Levenstein, M.E.; Fyodorov, D.V.; Kutach, A.K.; Kobayashi, R.; Kadonaga, J.T.** ACF consists of two subunits, Acf1 and ISWI, that function cooperatively in the ATP-dependent catalysis of chromatin assembly. *Genes Dev* **13** (12) 1999. pp. 1529-1539.
- Jacobs, J.J.; van Lohuizen, M.** Polycomb repression: from cellular memory to cellular proliferation and cancer. *Biochim Biophys Acta* **1602** (2) 2002. pp. 151-161.
- Jacobs, J.J.; Scheijen, B.; Voncken, J.W.; Kieboom, K.; Berns, A.; van Lohuizen, M.** Bmi-1 collaborates with c-Myc in tumorigenesis by inhibiting c-Myc-induced apoptosis via INK4aARF. *Genes Dev* **13** (20) 1999. pp. 2678-2690.
- Jahn, C.L.; Hutchison III, C.A.; Philips, S.J.; Weaver, S.; Haigwood, N.L.; Voliva, C.F.; Edgell, M.H.** DNA sequence organization of the beta-globin complex in the BALBc mouse. *Cell* **21** (1) 1980. pp. 159-168.
- Jane, S.M.; Gumucio, D.L.; Ney, P.A.; Cunningham, J.M.; Nienhuis, A.W.** Methylation-enhanced binding of Sp1 to the stage selector element of the human gamma-globin gene promoter may regulate development specificity of expression. *Mol Cell Biol* **13** (6) 1993. pp. 3272-3281.
- Jane, S.M.; Ney, P.A.; Vanin, E.F.; Gumucio, D.L.; Nienhuis, A.W.** Identification of a stage selector element in the human gamma-globin gene promoter that fosters preferential interaction with the 5' HS2 enhancer when in competition with the beta-promoter. *EMBO J* **11** (8) 1992. pp. 2961-2969.
- Jarman, A.P.; Higgs, D.R.** Nuclear scaffold attachment sites in the human globin gene complexes. *EMBO J* **7** (11) 1988. pp. 3337-3344.
- Jarman, A.P.; Wood, W.G.; Sharpe, J.A.; Gourdon, G.; Ayyub, H.; Higgs, D.R.** Characterization of the major regulatory element upstream of the human alpha-globin gene cluster. *Mol Cell Biol* **11** (9) 1991. pp. 4679-4689.
- Jeppesen, P.; Turner, B.M.** The inactive X chromosome in female mammals is distinguished by a lack of histone H4 acetylation, a cytogenetic marker for gene expression. *Cell* **74** (2) 1993. pp. 281-289.
- Johnson, P.F.; McKnight, S.L.** Eukaryotic transcriptional regulatory proteins. *Annu Rev Biochem* **58** 1989. pp. 799-839.
- Jones, P.L.; Veenstra, G.J.; Wade, P.A.; Vermaak, D.; Kass, S.U.; Landsberger, N.; Strouboulis, J.; Wolffe, A.P.** Methylated DNA and MeCP2 recruit histone deacetylase to repress transcription. *Nature Genet* **19** (2) 1998. pp. 187-191.
- Junwein, T.; Allis, C.D.** Translating the histone code. *Science* **293** (5532) 2001. pp. 1074-1080.
- Kadam, S.; McAlpine, G.S.; Phelan, M.L.; Kingston, R.E.; Jones, K.A.; Emerson, B.M.** Functional selectivity of recombinant mammalian SWI/SNF subunits. *Genes Dev* **14** (19) 2000. pp. 2441-2451.
- Kal, A.J.; Mahmoudi, T.; Zak, N.B.; Verrijzer, P.** The Drosophila brahma complex is an essential coactivator for the trithorax group protein zeste. *Genes Dev* **14** (9) 2000. pp. 1058-1071.
- Kass, S.U.; Landsberger, N.; Wolffe, A.P.** DNA methylation directs a time-dependent repression of transcription initiation. *Curr Biol* **7** (3) 1997. pp. 157-165.
- Kaufman, R.M.; Pham, C.T.N.; Ley, T.J.** Transgenic analysis of a 100-kb human beta-globin cluster-containing DNA fragment propagated as a bacterial artificial chromosome. *Blood* **94** (9) 1999. pp. 3178-3184.
- Kazminova, E.; Selker, E.U.** dim-2 encodes a DNA methyltransferase responsible for all known cytosine methylation in Neurospora. *EMBO J* **20** (15) 2001. pp. 4309-4320.

- Kellum, R.; Schedl, P.** A position-effect assay for boundaries of higher order chromosomal domains. *Cell* **64** (5) 1991. pp. 941-950.
- Kellum, R.; Schedl, P.** A group of scs elements function as domain boundaries in an enhancer-blocking assay. *Mol Cell Biol* **12** (5) 1992. pp. 2424-2431.
- Kennison, J.A.** The Polycomb and trithorax group proteins of Drosophila: trans-regulators of homeotic gene function. *Annu Rev Genet* **29** 1995. pp. 289-303.
- Kennison, J.A.; Tamkun, J.W.** Dosage-dependent modifiers of polycomb and antennapedia mutations in Drosophila. *Proc Natl Acad Sci U S A* **85** (21) 1988. pp. 8136-8140.
- Keshet, I.; Lieman-Hurwitz, J.; Cedar, H.** DNA methylation affects the formation of active chromatin. *Cell* **44** (4) 1986. pp. 535-543.
- Khavari, P.A.; Peterson, C.L.; Tamkun, J.W.; Mendel, D.B.; Crabtree, G.R.** BRG1 contains a conserved domain of the SWI2SNF2 family necessary for normal mitotic growth and transcription. *Nature* **366** (6451) 1993. pp. 170-174.
- Kieffer, L.J.; Greally, J.M.; Landres, I.; Nag, S.; Nakajima, Y.; Kohwi-Shigematsu, T.; Kavathas, P.B.** Identification of a candidate regulatory region in the human CD8 gene complex by colocalization of DNase I hypersensitive sites and matrix attachment regions which bind SATB1 and GATA-3. *J Immunol* **168** (8) 2002. pp. 3915-3922.
- Kim, C.G.; Swendeman, S.L.; Barnhart, K.M.; Sheffery, M.** Promoter elements and erythroid cell nuclear factors that regulate alpha-globin gene transcription in vitro. *Mol Cell Biol* **10** (11) 1990. pp. 5958-5966.
- Kim, M.K.; Lesoon-wood, L.A.; Weintraub, B.D.; Chung, J.H.** A soluble transcription factor, Oct-1, is also found in the insoluble nuclear matrix and possesses silencing activity in its alanine-rich domain. *Mol Cell Biol* **16** (8) 1996. pp. 4366-4377.
- Kioussis, D.; Vanin, E.; de Lange, T.; Flavell, R.A.; Grosfeld, F.G.** Beta-globin gene inactivation by DNA translocation in gamma beta-thalassaemia. *Nature* **306** (5944) 1983. pp. 662-666.
- Kioussis, D.; Festenstein, R.** Locus control regions: overcoming heterochromatin-induced gene inactivation in mammals. *Curr Opin Genetics Dev* **7** (5) 1997. pp. 614-619.
- Kitsberg, D.; Selig, S.; Keshet, I.; Cedar, H.** Replication structure of the human beta-globin gene domain. *Nature* **366** (6455) 1993. pp. 588-590.
- Knoll, W.; Pingel, E.** - *Acta Haematol* **2** 1949. pp. 369-369.
- Ko, M.S.H.** A stochastic model for gene induction. *J Theor Biol* **153** (2) 1990. pp. 181-194.
- Kollrias, G.; Wrighton, N.; Hurst, J.; Grosfeld, F.** Regulated expression of human A gamma-, beta-, and hybrid gamma beta-globin genes in transgenic mice: manipulation of the developmental expression patterns. *Cell* **46** (1) 1986. pp. 89-94.
- Kong, S.; Bohl, D.; Li, C.; Tuan, D.** Transcription of the HS2 enhancer toward a cis-linked gene is independent of the orientation, position, and distance of the enhancer relative to the gene. *Mol Cell Biol* **17** (7) 1997. pp. 3955-3965.
- Kornberg, R.** Chromatin structure: a repeating unit of histones and DNA. *Science* **184** (139) 1974. pp. 868-871.
- Kosteas, G.; Manifava, M.; Moschonas, N.; Anagnou, N.P.** Functional analysis of the Agamma to pseudo-beta globin gene region of the human beta-locus: evidence for negative regulatory elements. *Clin Res* **41** 1993. pp. 308-308.
- Kosteas, G.; Manifava, M.; Moschonas, N.; Anagnou, N.P.** Functional analysis of the Agamma to delta globin gene region of the beta-cluster: evidence for multiple negative regulatory elements. *Blood* **84** 1994. pp. 506-506.
- Kouzarides, T.** Histone methylation in transcriptional control. *Curr Opin Genetics Dev* **12** (2) 2002. pp. 198-209.
- Kulessa, H.; Frampton, J.; Graf, T.** GATA-1 reprograms avian myelomonocytic cell lines into eosinophils, thrombocytes, and erythroblasts. *Genes Dev* **9** (10) 1995. pp. 1250-1262.
- Kulozik, A.E.; Bellan-Koch, A.; Bail, S.; Kohne, E.; Kleihauer, E.** Thalassemia intermedia: moderate reduction of beta globin gene transcriptional activity by a novel mutation of the proximal CACCC promoter element. *Blood* **77** (9) 1991. pp. 2054-2058.
- Kulozik, A.E.; Bail, S.; Bellan-Koch, A.; Bartram, C.R.; Kohne, E.; Kleihauer, E.** The proximal element of the beta globin locus control region is not functionally required in vivo. *J Clin Invest* **87** (6) 1991. pp. 2142-2146.
- Kuo, M.H.; Brownell, J.E.; Sobel, R.E.; Ranalli, T.A.; Cook, R.G.; Edmonson, D.G.; Roth, S.Y.; Allis, C.D.** Transcription-linked acetylation by Gcn5p of histones H3 and H4 at specific lysines. *Nature* **383** (6597) 1996. pp. 269-272.
- Kuo, M.H.; Zhou, J.; Jambeck, P.; Churchill, M.E.; Allis, C.D.** Histone acetyltransferase activity of yeast Gcn5p is required for the activation of target genes in vivo. *Genes Dev* **12** (5) 1998. pp. 627-639.
- Kwon, H.; Imbalzano, A.N.; Khavari, P.A.; Kingston, R.E.; Green, M.R.** Nucleosome disruption and enhancement of activator binding by a human SW1SNF complex. *Nature* **370** (6489) 1994. pp. 477-481.
- L'Hernault, S.W.; Rosenbaum, J.L.** Chlamydomonas alpha-tubulin is posttranslationally modified by acetylation on the epsilon-amino group of a lysine. *Biochemistry* **24** (2) 1985. pp. 473-478.
- Lachner, M.; O'Carroll, D.; Rea, S.; Mechtler, K.; Junewein, T.** Methylation of histone H3 lysine 9 creates a binding site for HP1 proteins. *Nature* **410** (6824) 2001. pp. 116-120.
- Laemmli, U.K.; Kas, E.; Poljak, L.; Adachi, Y.** Scaffold-associated regions: cis-acting determinants of chromatin structural loops and functional domains. *Curr Opin Genetics Dev* **2** (2) 1992. pp. 275-285.
- Langst, G.; Bonte, E.J.; Corona, D.F.; Becker, P.B.** Nucleosome movement by CHRAC and ISWI without disruption or trans-displacement of the histone octamer. *Cell* **97** (7) 1999. pp. 843-852.
- Langst, G.; Becker, P.B.; Wu, C.** Nucleosome mobilization and positioning by ISWI-containing chromatin-remodeling factors. *J Cell Sci* **114** 2001. pp. 2561-2568.
- Larschan, E.; Winston, F.** The S. cerevisiae SAGA complex functions in vivo as a coactivator for transcriptional activation by Gal4. *Genes Dev* **15** (15) 2001. pp. 1946-1956.
- Leder, A.; Weir, L.; Leder, P.** Characterization, expression, and evolution of the mouse embryonic zeta-globin gene. *Mol Cell Biol* **5** (5) 1985. pp. 1025-1033.
- Lederberg, J.** Streptomycin resistance: a genetically recessive mutation. *J Bacteriol* **61** 1951. pp. 549-550.
- Lee, C-H.; Murphy, M.R.; Lee, J-S.; Chung, J.H.** Targeting a SWISNF-related chromatin remodeling complex to the beta-globin promoter in erythroid cells. *Proc Natl Acad Sci U S A* **96** (22) 1999. pp. 12311-12315.
- Lee, D.Y.; Hayes, J.J.; Pruss, D.; Wolffe, A.P.** A positive role for histone acetylation in transcription factor access to nucleosomal DNA. *Cell* **72** (1) 1993. pp. 73-84.
- Lee, J.S.; Ngo, H.; Kin, D.; Chung, H.** Erythroid Kruppel-like factor is recruited to the CACCC box in the beta-globin promoter but not to the CACCC box in the gamma-globin promoter: the role of the neighboring promoter elements. *Proc Natl Acad Sci U S A* **97** (6) 2000. pp. 2468-2473.
- Lei, H.; Oh, S.P.; Okano, M.; Jutterman, R.; Goss, K.A.; Jeanisch, R.; Li, E.** De novo DNA cytosine methyltransferase activities in mouse embryonic stem cells. *Development* **122** (10) 1996. pp. 3195-3205.
- Leipe, D.D.; Landsman, D.** Histone deacetylases, acetoin utilization proteins and acetylpolyamine amidohydrolases are members of an ancient protein superfamily. *Nucleic Acids Res* **25** (18) 1997. pp. 3693-3697.
- Lewis, J.D.; Meehan, R.R.; Henzel, W.J.; Maurer-Vogt, I.; Jeppesen, P.; Klein, G.; Bird, A.P.** Purification, sequence, and cellular localization of a novel chromosomal protein that binds to methylated DNA. *Cell* **96** (6) 1992. pp. 905-914.
- Li, Q.; Stamatoyannopoulos, G.** - *Mol Cell Biol* **14** 1994. pp. 6087-6087.

- Li, Q.; Blau, C.A.; Clegg, C.H.; Rohde, A.; Stamatoyannopoulos, G.** Multiple epsilon-promoter elements participate in the developmental control of epsilon-globin genes in transgenic mice. *J Biol Chem* **273** (28) 1998. pp. 17361-17367.
- Li, Q.; Zhang, M.; Stamatoyannopoulos, G.** Structural analysis and mapping of DNase I hypersensitivity of HS5 of the beta-globin locus control region. *Genomics* **61** (2) 1999. pp. 183-193.
- Li, Q.; Stamatoyannopoulos, G.** Hypersensitive site 5 of the human beta locus control region functions as a chromatin insulator. *Blood* **84** (5) 1994. pp. 1399-1401.
- Liebhäber, S.A.; Wang, Z.; Cash, F.E.; Monks, B.; Russell, J.E.** Developmental silencing of the embryonic zeta-globin gene: concerted action of the promoter and the 3'-flanking region combined with stage-specific silencing by the transcribed segment. *Mol Cell Biol* **16** (6) 1996. pp. 2637-2646.
- Lim, L.C.; Swendeman, S.L.; Sheffery, M.** Molecular cloning of the alpha-globin transcription factor CP2. *Mol Cell Biol* **12** (2) 1992. pp. 828-835.
- Lim, L.C.; Fang, L.; Swendeman, S.L.; Sheffery, M.** Characterization of the molecularly cloned murine alpha-globin transcription factor CP2. *J Biol Chem* **268** (24) 1993. pp. 18008-18017.
- Lin, Y.S.; Green, M.R.** Mechanism of action of an acidic transcriptional activator in vitro. *Cell* **64** (5) 1991. pp. 971-981.
- Lindenbaum, M.H.; Grosfeld, F.** An in vitro globin gene switching model based on differentiated embryonic stem cells. *Genes Dev* **4** (12) 1990. pp. 2075-2085.
- Litt, M.D.; Simpson, M.; Gaszner, M.; Allis, C.D.; Felsenfeld, G.** Correlation between histone lysine methylation and developmental changes at the chicken beta-globin locus. *Science* **293** (5539) 2001. pp. 2453-2455.
- Liu, B.; Maul, R.S.; Kaetzel, D.M.** Repression of platelet-derived growth factor A-chain gene transcription by an upstream silencer element. Participation by sequence-specific single-stranded DNA-binding proteins. *J Biol Chem* **271** (42) 1996. pp. 26281-26290.
- Liu, Q.; Bungert, J.; Engel, J.D.** Mutation of gene-proximal regulatory elements disrupts human epsilon-, gamma-, and beta-globin expression in yeast artificial chromosome transgenic mice. *Proc Natl Acad Sci U S A* **94** (1) 1997. pp. 169-174.
- Liu, Q.; Chang, J.C.; Moi, P.; Liu, W.; Kan, Y.W.; Curtin, P.T.** Dissection of the enhancer activity of beta-globin 5' DNase I-hypersensitive site 2 in transgenic mice. *Proc Natl Acad Sci U S A* **89** (9) 1992. pp. 3899-3899.
- Liu, Q.; Tanimoto, K.; Bungert, J.; Engel, J.D.** The A gamma-globin 3' element provides no unique function(s) for human beta-globin locus gene regulation. *Proc Natl Acad Sci U S A* **95** (17) 1998. pp. 9944-9949.
- Lo, W.S.; Trievel, R.C.; Rojas, J.R.; Duggan, L.; Hsu, J.Y.; Allis, C.D.; Marmorstein, R.; Berger, S.L.** Phosphorylation of serine 10 in histone H3 is functionally linked in vitro and in vivo to Gen5-mediated acetylation at lysine 14. *Mol Cell* **5** (6) 2000. pp. 917-926.
- Locke, J.; Kotarski, M.A.; Tartof, K.D.** Dosage-dependent modifiers of position effect variegation in Drosophila and a mass action model that explains their effect. *Genetics* **120** (1) 1988. pp. 181-198.
- Lohuizen, M.V.** The trithorax-group and polycomb-group chromatin modifiers: implications for disease. *Curr Opin Genetics Dev* **9** (3) 1999. pp. 355-361.
- Lowrey, C.H.; Bodine, D.M.; Nienhuis, A.W.** Mechanism of DNase I hypersensitive site formation within the human globin locus control region. *Proc Natl Acad Sci U S A* **89** (3) 1992. pp. 1143-1147.
- Lu, S.J.; Rowan, S.; Bani, M.R.; Ben-David, Y.** Retroviral integration within the Fli-2 locus results in inactivation of the erythroid transcription factor NF-E2 in Friend erythroleukemias: evidence that NF-E2 is essential for globin expression. *Proc Natl Acad Sci U S A* **91** (18) 1994. pp. 8398-8402.
- Luger, K.; Mader, A.W.; Richmond, R.K.; Sargent, D.F.; Richmond, T.J.** Crystal structure of the nucleosome core particle at 2.8 Å resolution. *Nature* **389** (6648) 1997. pp. 251-260.
- Lund, A.H.; van Lohuizen, M.** RUNX: a trilogy of cancer genes. *Cancer Cell* **1** (3) 2002. pp. 213-215.
- Lundgren, M.; Chow, C.M.; Sabbattini, P.; Georgiou, A.; Minaee, S.; Dillon, N.A.** Transcription factor dosage affects changes in higher order chromatin structure associated with activation of a heterochromatic gene. *Cell* **103** (5) 2000. pp. 733-743.
- Lyko, F.; Ramsahoye, B.H.; Kashevsky, H.; Tudor, M.; Mastrangelo, M.A.; Orr-Weaver, T.L.; Jaenisch, R.** Mammalian (cytosine-5) methyltransferases cause genomic DNA methylation and lethality in Drosophila. *Nature Genet* **23** (3) 1999. pp. 363-366.
- Ma, H.; Bauman, C.T.; Li, I.H.; Strahl, B.D.; Rice, R.; Jelnek, M.A.; Aswad, D.W.; Allis, C.D.; Hager, G.L.; Stallcup, M.R.** Hormone-dependent, CARM1-directed, arginine-specific methylation of histone H3 on a steroid-regulated promoter. *Curr Biol* **11** (24) 2001. pp. 1981-1985.
- Mantovani, R.; Malgaretti, N.; Nicolis, S.; Ronchi, A.; Giglioni, B.; Ottolenghi, S.** The effects of HPFH mutations in the human gamma-globin promoter on binding of ubiquitous and erythroid specific nuclear factors. *Nucleic Acids Res* **16** (16) 1988. pp. 7783-7797.
- Marin, M.; Karis, A.; Visser, P.; Grosfeld, F.; Philipsen, S.** Transcription factor Sp1 is essential for early embryonic development but dispensable for cell growth and differentiation. *Cell* **89** (4) 1997. pp. 619-628.
- Marzio, G.; Wagener, C.; Gutierrez, M.I.; Cartwright, P.; Helin, K.; Giacca, M.** E2F family members are differentially regulated by reversible acetylation. *J Biol Chem* **275** (15) 2000. pp. 10887-10892.
- Martens, J.H.; Verlaan, M.; Kalkhoven, E.; Dorsman, J.C.; Zantema, A.** Scaffoldmatrix attachment region elements interact with a p300-scaffold attachment factor A complex and are bound by acetylated nucleosomes. *Mol Cell Biol* **22** (8) 2002. pp. 2598-2606.
- Martin, D.I.K.; Tsai, S.F.; Orkin, S.H.** Increased gamma-globin expression in a nondeletion HPFH mediated by an erythroid-specific DNA-binding factor. *Nature* **338** (6214) 1989. pp. 435-438.
- Martin, D.I.K.; Zon, L.I.; Mutter, G.; Orkin, S.H.** Expression of an erythroid transcription factor in megakaryocytic and mast cell lineages. *Nature* **344** (6265) 1990. pp. 444-447.
- Martin, D.I.K.; Fiering, S.; Groudine, M.** Regulation of beta-globin gene expression: straightening out the locus. *Curr Opin Genetics Dev* **6** (4) 1996. pp. 488-495.
- Martin, S.L.; Vincent, K.A.; Wilson, A.C.** Rise and fall of the delta globin gene. *J Mol Biol* **164** (4) 1983. pp. 513-528.
- Martinez-Balbas, M.; Bauer, U.M.; Nielsen, S.J.; Brehm, A.; Kouzarides, T.** Regulation of E2F1 activity by acetylation. *EMBO J* **19** (4) 2000. pp. 662-671.
- Matsuo, K.; Caly, O.; Takahashi, T.; Silke, J.; Schaffner, W.** Evidence for erosion of mouse CpG islands during mammalian evolution. *Somat Cell Mol Genet* **19** (6) 1993. pp. 543-555.
- Maxon, M.; Goodrich, J.A.; Tjian, R.** Transcription factor IIE binds preferentially to RNA polymerase IIa and recruits TFIIH: a model for promoter clearance. *Genes Dev* **8** (5) 1994. pp. 515-524.
- McMorrow, T.; van den Wijngaard, A.; Wollenschlaeger, A.; van de Corput, M.; Monkhorst, K.; Trimborn, T.; Fraser, P.; van Lohuizen, M.; Junewein, T.; Djabali, M.; Philipsen, S.; Grosfeld, F.; Milot, E.** Activation of the beta globin locus by transcription factors and chromatin modifiers. *EMBO J* **19** (18) 2000. pp. 4986-4996.
- McPherson, C.E.; Shim, E.Y.; Friedman, D.S.; Zaret, K.S.** An active tissue-specific enhancer and bound transcription factors existing in a precisely positioned nucleosomal array. *Cell* **75** (2) 1993. pp. 387-398.
- Medvinsky, A.; Dzierzak, E.** Definitive hematopoiesis is autonomously initiated by the AGM region. *Cell* **86** (6) 1996. pp. 897-906.
- Medvinsky, A.; Samoilina, N.L.; Muller, A.M.; Dzierzak, E.A.** An early pre-liver intraembryonic source of CFU-S in the developing mouse. *Nature* **364** (6432) 1993. pp. 64-67.

- Merika, M.; Orkin, S.H.** Functional synergy and physical interactions of the erythroid transcription factor GATA-1 with the Kruppel family proteins Sp1 and EKLF. *Mol Cell Biol* **15** (5) 1995. pp. 2437-2447.
- Metcalf, D.** Lineage commitment and maturation in hematopoietic cells: the case for extrinsic regulation. *Blood* **92** (2) 1998. pp. 345-347.
- Michaelson, J.** Cellular selection in the genesis of multicellular organization. *Lab Invest* **69** (2) 1993. pp. 136-151.
- Mignotte, V.; Wall, L.; de Boer, E.; Grosveld, F.; Romeo, P.H.** Two tissue-specific factors bind the erythroid promoter of the human porphobilinogen deaminase gene. *Nucleic Acids Res* **17** (1) 1989. pp. 37-54.
- Miller, I.J.; Bieker, J.J.** A novel, erythroid cell-specific murine transcription factor that binds to the CACCC element and is related to the Kruppel family of nuclear proteins. *Mol Cell Biol* **13** (5) 1993. pp. 2776-2786.
- Milot, E.; Strouboulis, J.; Trimborn, T.; Wijgerde, M.; de Boer, E.; Langeveld, A.; Tan-Un, K.; Vergeer, W.; Yannoutsos, N.; Grosveld, F.; Fraser, P.** Heterochromatin effects on the frequency and duration of LCR-mediated gene transcription. *Cell* **87** (1) 1996. pp. 105-114.
- Mirkovitch, J.; Mirault, M.E.; Laemmli, U.K.** Organization of the higher-order chromatin loop: specific DNA attachment sites on nuclear scaffold. *Cell* **39** (1) 1984. pp. 223-232.
- Mishima, N.; Landman, H.; Huisman, T.H.; Gilman, J.G.** The DNA deletion in an Indian delta beta-thalassaemia begins one kilobase from the A gamma globin gene and ends in an L1 repetitive sequence. *Br J Haematol* **73** (3) 1989. pp. 375-379.
- Misteli, T.** Protein dynamics: implications for nuclear architecture and gene expression. *Science* **291** (5505) 2001. pp. 843-847.
- Mizuguchi, G.; Tsukiyama, T.; Wisniewski, J.; Wu, C.** Role of nucleosome remodeling factor NURF in transcriptional activation of chromatin. *Mol Cell* **1** (1) 1997. pp. 141-150.
- Mizuguchi, G.; Vassilev, A.; Tsukiyama, T.; Nakatani, Y.; Wu, C.** ATP-dependent nucleosome remodeling and histone hyperacetylation synergistically facilitate transcription of chromatin. *J Biol Chem* **276** (18) 2001. pp. 14773-14783.
- Moi, P.; Kan, Y.W.** Synergistic enhancement of globin gene expression by activator protein-1-like proteins. *Proc Natl Acad Sci U S A* **87** (22) 1990. pp. 9000-9004.
- Molete, J.M.; Petrykowska, H.; Bouhassira, E.E.; Feng, Y.; Miller, W.; Hardison, R.C.** Sequences flanking hypersensitive sites of the beta-globin locus control region are required for synergistic enhancement. *Mol Cell Biol* **21** (9) 2001. pp. 2969-2980.
- Moon, A.M.; Ley, T.J.** Conservation of the primary structure, organization, and function of the human and mouse beta-globin locus-activating regions. *Proc Natl Acad Sci U S A* **87** (19) 1990. pp. 7693-7697.
- Moore, M.A.; Metcalf, D.** Ontogeny of the haemopoietic system: yolk sac origin of in vivo and in vitro colony forming cells in the developing mouse embryo. *Br J Haematol* **18** (3) 1970. pp. 279-296.
- Moreau, P.; Hen, R.; Waslylk, B.; Everett, R.; Gaub, M.P.; Chambon, P.** The SV40 72 base repair repeat has a striking effect on gene expression both in SV40 and other chimeric recombinants. *Nucleic Acids Res* **9** (22) 1981. pp. 6047-6068.
- Morley, B.J.; Abbot, C.A.; Sharpe, J.; Lida, P.S.; Chan-Thomas, X.; Wood, W.G.** A single beta-globin locus control region element (5' hypersensitive site 2) is sufficient for developmental regulation of human globin genes in transgenic mice. *Mol Cell Biol* **12** (5) 1992. pp. 2057-2066.
- Muchardt, C.; Yaniv, M.** A human homologue of *Saccharomyces cerevisiae* SNF2SWI2 and *Drosophila* brm genes potentiates transcriptional activation by the glucocorticoid receptor. *EMBO J* **12** (11) 1993. pp. 4279-4290.
- Mueller-Storm, H.P.; Sogo, J.M.; Schaffner, W.** An enhancer stimulates transcription in trans when attached to the promoter via a protein bridge. *Cell* **58** (4) 1989. pp. 767-777.
- Mukouyama, Y.S.; Hara, T.; Xu, M.J.; Tamura, K.; Donovan, P.J.; Nakahata, T.; Miyajima, A.** In vitro expansion of murine multipotential hematopoietic progenitors from the embryonic aorta-gonad-mesonephros region. *Immunity* **8** (1) 1998. pp. 105-114.
- Mulder, M.P.; Wilke, M.; Langeveld, A.; Whilming, L.G.; Hagemeyer, A.; van Drunen, E.; Zwarthoff, E.C.; Riegman, P.H.; Deelen, W.H.; van den Ouwerland, A.M.** Positional mapping of loci in the DiGeorge critical region at chromosome 22q11 using a new marker (D22S183). *Hum Genet* **96** (2) 1995. pp. 133-141.
- Muller, H.** Types of visible variations induced by X-rays in *Drosophila*. *Drosophila J Genet* **22** 1930. pp. 299-334.
- Muravyova, E.; Golovnin, A.; Gracheva, E.; Parshikov, A.; Belenkaya, T.; Pirrotta, V.; Georgiev, P.** Loss of insulator activity by paired Su(Hw) chromatin insulators. *Science* **291** (5503) 2001. pp. 495-498.
- Muyrers, J.P.P.; Zhang, Y.; Testa, G.; Stewart, A.F.** Rapid modification of bacterial artificial chromosomes by ET-recombination. *Nucleic Acids Res* **27** (6) 1999. pp. 1555-1557.
- Muyrers, J.P.P.; Zhang, Y.; Benes, V.; Testa, G.; Ansorge, W.; Stewart, A.F.** Point mutation of bacterial artificial chromosomes by ET recombination. *EMBO rep* **1** (3) 2000. pp. 239-243.
- Myers, R.M.; Tilly, K.; Maniatis, T.** Fine structure genetic analysis of a beta-globin promoter. *Science* **232** (4750) 1986. pp. 613-618.
- Nakao, M.** Epigenetics: interaction of DNA methylation and chromatin. *Gene* **278** (1) 2001. pp. 25-31.
- Nan, X.; Meehan, R.R.; Bird, A.P.** Dissection of the methyl-CpG binding domain from the chromosomal protein MeCP2. *Nucleic Acids Res* **21** (21) 1993. pp. 4886-4892.
- Nan, X.; Tate, P.; Bird, A.P.** DNA methylation specifies chromosomal localization of MeCP2. *Mol Cell Biol* **16** (1) 1996. pp. 414-421.
- Nan, X.; Ng, H.H.; Johnson, C.A.; Laherty, C.D.; Turner, B.M.; Eisenman, R.N.; Bird, A.P.** Transcriptional repression by the methyl-CpG-binding protein MeCP2 involves a histone deacetylase complex. *Nature* **393** (6683) 1998. pp. 386-389.
- Narayanan, K.; Williamson, R.; Zhang, Y.; Stewart, A.F.; Ioannou, P.A.** Efficient and precise engineering of a 200 kb beta-globin humanbacterial artificial chromosome in *E. coli* DH10B using an inducible homologous recombination system. *Gene Therapy* **6** (3) 1999. pp. 442-447.
- Narlikar, G.J.; Fan, H.Y.; Kingston, R.E.** Cooperation between complexes that regulate chromatin structure and transcription. *Cell* **108** (4) 2002. pp. 475-487.
- Natarajan, K.; Jackson, B.M.; Zhou, H.; Winston, F.; Hinnebusch, A.G.** Transcriptional activation by Gcn4p involves independent interactions with the SWISNF complex and the SRBmediator. *Mol Cell* **4** (4) 1999. pp. 657-664.
- Navas, P.A.; Peterson, K.R.; Li, Q.; Skarpida, E.; Rohde, A.; Shaw, S.E.; Clegg, C.H.; Asano, H.; Stamatoyannopoulos, G.** Developmental specificity of the interaction between the locus control region and embryonic or fetal globin genes in transgenic mice with an HS3 core deletion. *Mol Cell Biol* **18** (7) 1998. pp. 4188-4196.
- Navas, P.A.; Li, Q.; Peterson, K.R.; Swank, R.A.; Rohde, A.; Roy, J.; Stamatoyannopoulos, G.** Activation of the beta-like globin genes in transgenic mice is dependent on the presence of the beta-locus control region. *Hum Mol Gen* **11** (8) 2002. pp. 893-903.
- Neely, K.E.; Hassan, A.H.; Wallberg, A.E.; Steger, D.J.; Cairns, B.R.; Wright, A.P.; Workman, J.L.** Activation domain-mediated targeting of the SWISNF complex to promoters stimulates transcription from nucleosome arrays. *Mol Cell* **4** (4) 1999. pp. 649-655.
- Nemazee, D.** Receptor selection in B and T lymphocytes. *Annu Rev Immunol* **18** 2000. pp. 19-51.
- Ney, P.A.; Sorrentino, B.P.; McDonagh, K.T.; Nienhuis, A.W.** Tandem AP-1-binding sites within the human beta-globin dominant control region function as an inducible enhancer in erythroid cells. *Genes Dev* **4** (6) 1990. pp. 993-1006.
- Ng, K.W.; Ridgway, P.; Cohen, D.R.; Tremethick, D.J.** The binding of a FosJun heterodimer can completely disrupt the structure of a nucleosome. *EMBO J* **16** (8) 1997. pp. 2072-2085.

- Nielsen, S.J.; Schneider, R.; Bauer, U-M.; Bannister, A.J.; Morrison, A.; O Carroll, D.; Firestein, R.; Cleary, M.; Jenuwein, T.; Herrera, R.E.; Kouzarides, T. Rb targets histone H3 methylation and HP1 to promoters. *Nature* **412** (6846) 2001. pp. 561-565.
- Nishioka, Y.; Leder, P. The complete sequence of a chromosomal mouse alpha-globin gene reveals elements conserved throughout vertebrate evolution. *Cell* **18** (3) 1979. pp. 875-882.
- Norma, K-I.; Allis, C.D.; Grewall, S.I.S. Transitions in distinct histone H3 methylation patterns at the heterochromatin domain boundaries. *Science* **293** (5532) 2001. pp. 1150-1155.
- Nuez, B.; Michalovich, D.; Bygrave, A.; Ploemacher, R.; Grosfeld, F. Defective hematopoiesis in fetal liver resulting from inactivation of the EKLF gene. *Nature* **375** (6529) 1995. pp. 316-318.
- O Carroll, D.; Scherthan, H.; Peters, A.H.; Opravil, S.; Haynes, A.R.; Laible, G.; Rea, S.; Schmid, M.; Lebersorger, A.; Jeratsch, M. Isolation and characterization of Suv39h2, a second histone H3 methyltransferase gene that displays testis-specific expression. *Mol Cell Biol* **20** (24) 2000. pp. 9423-9433.
- O'Connor, M.; Peifer, M.; Bender, W. Construction of large DNA segments in Escherichia coli. *Science* **244** (4910) 1989. pp. 1307-1312.
- O'Neill, L.P.; Turner, B.M. Histone H4 acetylation distinguishes coding regions of the human genome from heterochromatin in a differentiation-dependent but transcription-independent manner. *EMBO J* **14** (16) 1995. pp. 3946-3957.
- Ogawa, M. Differentiation and proliferation of hematopoietic stem cells. *Blood* **81** (11) 1993. pp. 2844-2853.
- Ogbourne, S.; Antalis, T.M. Transcriptional control and the role of silencers in transcriptional regulation in eukaryotes. *Biochem J* **331** 1998. pp. 1-14.
- Ohki, I.; Shimotake, N.; Fujita, N.; Jee, J.; Ikegami, T.; Nakao, M.; Shirakawa, M. Solution structure of the methyl-CpG binding domain of human MBD1 in complex with methylated DNA. *Cell* **105** (4) 2001. pp. 487-497.
- Okano, M.; Xie, S.; Li, E. Cloning and characterization of a family of novel mammalian DNA (cytosine-5) methyltransferases. *Nature Genet* **19** (3) 1998. pp. 219-220.
- Okano, M.; Bell, D.W.; Haber, D.A.; Li, E. DNA methyltransferases Dnmt3a and Dnmt3b are essential for de novo methylation and mammalian development. *Cell* **99** (3) 1999. pp. 247-257.
- Olins, A.L.; Olins, D.E. Spheroid chromatin units (v bodies). *Science* **183** (122) 1974. pp. 330-332.
- Oliva, R.; Bazett-Jones, D.P.; Locklear, L.; Dixon, G.H. Histone hyperacetylation can induce unfolding of the nucleosome core particle. *Nucleic Acids Res* **18** (9) 1990. pp. 2739-2747.
- Omichinski, J.G.; Clore, G.M.; Schaad, O.; Felsenfeld, G.; Trainor, C.; Appella, E.; Stahl, S.J.; Gronenborn, A.M. NMR structure of a specific DNA complex of Zn-containing DNA binding domain of GATA-1. *Science* **261** (5120) 1993. pp. 438-446.
- Orkin, S.H. *Disorders of Hemoglobin Synthesis: The Thalassemias* 1986. pp. ??.
- Orkin, S.H. GATA-binding transcription factors in hematopoietic cells. *Blood* **80** (3) 1992. pp. 575-581.
- Orkin, S.H. *Hemoglobin switching: the molecular basis of blood diseases* 2000. pp. 80-102.
- Orlando, V. Mapping chromosomal proteins in vivo by formaldehyde-crosslinked-chromatin immunoprecipitation. *Trends Biochem Sci* **25** (3) 2000. pp. 99-104.
- Ozbudak, E.M.; Thattai, M.; Kurtser, I.; Grossman, A.D.; van Oudenaarden, A. Regulation of noise in the expression of a single gene. *Nature Genet* **31** (1) 2002. pp. 69-73.
- Papoulas, O.; Beek, S.J.; Moseley, S.L.; McCallum, C.M.; Sarte, M.; Shearn, A.; Tamkun, J.W. The Drosophila trithorax group proteins BRM, ASH1 and ASH2 are subunits of distinct protein complexes. *Development* **125** (20) 1998. pp. 3955-3966.
- Paro, R. Propagating memory of transcriptional states. *Trends Genet* **11** (8) 1995. pp. 295-297.
- Pavan, W.J.; Hieter, P.; Reeves, R.H. Generation of deletion derivatives by targeted transformation of human-derived yeast artificial chromosomes. *Proc Natl Acad Sci U S A* **87** (4) 1990. pp. 1300-1304.
- Perkins, A.C.; Sharpe, A.H.; Orkin, S.H. Lethal beta-thalassaemia in mice lacking the erythroid CACCC-transcription factor EKLF. *Nature* **375** (6529) 1995. pp. 318-322.
- Perkins, A.C.; Gaensler, K.M.L.; Orkin, S.H. Silencing of human fetal globin expression is impaired in the absence of the adult beta-globin gene activator protein EKLF. *Proc Natl Acad Sci U S A* **93** (22) 1996. pp. 12267-12271.
- Peters, B.; Merezhinskaya, N.; Diffley, J.F.; Noguchi, C.T. Protein-DNA interactions in the epsilon-globin gene silencer. *J Biol Chem* **286** (5) 1993. pp. 3430-3437.
- Peterson, K.R.; Clegg, C.H.; Navas, P.A.; Norton, E.J.; Kimborough, T.G.; Stamatoyannopoulos, G. Effect of deletion of 5'HS3 or 5'HS2 of the human beta-globin locus control region on the developmental regulation of globin gene expression in beta-globin locus yeast artificial chromosome transgenic mice. *Proc Natl Acad Sci U S A* **93** (13) 1996. pp. 6605-6609.
- Peterson, K.R.; Clegg, C.H.; Huxley, C.; Josephson, B.M.; Haugen, H.S.; Furukawa, T.; Stamatoyannopoulos, G. Transgenic mice containing a 248-kb yeast artificial chromosome carrying the human beta-globin locus display proper developmental control of human globin genes. *Proc Natl Acad Sci U S A* **90** (16) 1993. pp. 7593-7597.
- Peterson, K.R.; Navas, P.; Stamatoyannopoulos, G. Beta-YAC transgenic mice for studying LCR function. *Ann NY Acad Sci* **850** 1998. pp. 28-37.
- Petruk, S.; Sedkov, Y.; Smith, S.; Tillib, S.; Kraevski, V.; Nakamura, T.; Canaani, E.; Croce, C.M.; Mazo, A. Trithorax and dCBP acting in a complex to maintain expression of a homeotic gene. *Science* **294** (5545) 2001. pp. 1331-1334.
- Pettersson, S.; Cook, G.P.; Bruggeman, M.; Williams, G.; Neuberger, M.S. A second B-cell specific enhancer 3' of the immunoglobulin heavy-chain locus. *Nature* **344** (6262) 1990. pp. 165-168.
- Pevny, L.; Simon, M.C.; Robertson, E.; Klein, W.H.; Tsai, S.F.; D'Agati, V.; Orkin, S.H.; Costantini, F. Erythroid differentiation in chimaeric mice blocked by a targeted mutation in the gene for transcription factor GATA-1. *Nature* **349** (6306) 1991. pp. 257-260.
- Pham, A.D.; Sauer, F. Ubiquitin-activating-conjugating activity of TAFII250, a mediator of activation of gene expression in Drosophila. *Science* **289** (5488) 2000. pp. 2357-2360.
- Philipsen, S.; Talbot, D.; Fraser, P.; Grosfeld, F. The beta-globin dominant control region: hypersensitive site 2. *EMBO J* **9** (7) 1990. pp. 2159-2167.
- Philipsen, S.; Pruzina, S.; Grosfeld, F. The minimal requirements for activity in transgenic mice of hypersensitive site 3 of the beta globin locus control region. *EMBO J* **12** (3) 1993. pp. 1077-1085.
- Pikaart, M.J.; Recillas-Targa, F.; Felsenfeld, G. Loss of transcriptional activity of a transgene is accompanied by DNA methylation and histone deacetylation and is prevented by insulators. *Genes Dev* **12** (18) 1998. pp. 2852-2862.
- Pirrotta, V. Polycomb the genome: PcG, trxG, and chromatin silencing. *Cell* **93** (3) 1998. pp. 333-336.
- Platt, T. Transcription termination and the regulation of gene expression. *Annu Rev Biochem* **55** 1986. pp. 339-372.
- Podolsky, T.; Fong, S.T.; Lee, B.T.O. Direct selection of tetracycline-sensitive Escherichia coli cells using nickel salts. *Plasmid* **36** (2) 1996. pp. 112-115.
- Pondel, M.; Murphy, S.; Pearson, L.; Craddock, C.; Proudfoot, N.J. Sp1 functions in a chromatin-dependent manner to augment human alpha-globin promoter activity. *Proc Natl Acad Sci U S A* **92** (16) 1995. pp. 7237-7241.

- Pondel, M.D.; Proudfoot, N.J.; Whitelaw, C.; Whitelaw, E.** The developmental regulation of the human zeta-globin gene in transgenic mice employing beta-galactosidase as a reporter gene. *Nucleic Acids Res* **20** (21) 1992. pp. 5655-5660.
- Porcu, S.; Kitamura, M.; Witkowska, E.; Zhang, Z.; Mutero, A.; Lin, C.; Chang, J.; Gaensler, K.M.L.** The human beta globin locus introduced by YAC transfer exhibits a specific and reproducible pattern of developmental regulation in transgenic mice. *Blood* **90** (11) 1997. pp. 4602-4609.
- Poustka, A.; Rackwitz, H.R.; Frischauft, A.M.; Hohn, B.; Lehrac, H.** Selective isolation of cosmid clones by homologous recombination in Escherichia coli. *Proc Natl Acad Sci U S A* **81** (13) 1984. pp. 4129-4133.
- Proudfoot, N.** Poly(A) signals. *Cell* **64** (4) 1991. pp. 671-674.
- Pruzina, S.; Hanscombe, O.; Whyatt, D.; Grosfeld, F.; Philipsen, S.** Hypersensitive site 4 of the human beta globin locus control region. *Nucleic Acids Res* **19** (7) 1991. pp. 1413-1419.
- Ptashne, M.** How eukaryotic transcriptional activators work. *Nature* **335** (6192) 1988. pp. 638-639.
- Ptashne, M.; Gann, A.** Transcriptional activation by recruitment. *Nature* **386** (6625) 1997. pp. 569-577.
- Purucker, M.; Bodine, D.; Lin, H.; McDonagh, K.; Nienhuis, A.W.** Structure and function of the enhancer 3' to the human A gamma globin gene. *Nucleic Acids Res* **18** (24) 1990. pp. 7407-7415.
- Raich, N.; Clegg, C.H.; Grofti, J.; Romeo, P.H.; Stamatoyannopoulos, G.** GATA1 and YY1 are developmental repressors of the human epsilon-globin gene. *EMBO J* **14** (4) 1995. pp. 801-809.
- Raich, N.; Enver, T.; Nakamoto, B.; Josephson, B.; Papayannopoulou, T.; Stamatoyannopoulos, G.** Autonomous developmental control of human embryonic globin gene switching in transgenic mice. *Science* **250** (4984) 1990. pp. 1147-1149.
- Raich, N.; Papayannopoulou, T.; Stamatoyannopoulos, G.; Enver, T.** Demonstration of a human epsilon-globin gene silencer with studies in transgenic mice. *Blood* **79** (4) 1992. pp. 861-864.
- Rea, S.; Eisenhaber, F.; O'Carroll, D.; Strahl, B.D.; Sun, Z.W.; Schmid, M.; Opravil, S.; Mechteder, K.; Ponting, C.P.; Allis, C.D.; Junewein, T.** Regulation of chromatin structure by site-specific histone H3 methyltransferases. *Nature* **403** (6796) 2000. pp. 593-599.
- Reik, A.; Telling, A.; Zitnik, G.; Cimbara, D.; Epner, E.; Groudine, M.** The locus control region is necessary for gene expression in the human beta-globin locus but not the maintenance of an open chromatin structure in erythroid cells. *Mol Cell Biol* **18** (10) 1998. pp. 5992-6000.
- Rich, I.N.** Primordial germ cells are capable of producing cells of the hematopoietic system in vitro. *Blood* **86** (2) 1995. pp. 463-472.
- Riviere, I.; Sunshine, M.J.; Littman, D.R.** Regulation of IL-4 expression by activation of individual alleles. *Immunity* **9** (2) 1998. pp. 217-228.
- Robzyk, K.; Recht, J.; Osley, M.A.** Rad6-dependent ubiquitination of histone H2B in yeast. *Science* **287** (5452) 2000. pp. 501-504.
- Rohrbaugh, M.L.; Hardison, R.C.** Analysis of rabbit beta-like globin gene transcripts during development. *J Mol Biol* **164** (3) 1983. pp. 395-417.
- Rojas, J.R.; Triivel, R.C.; Zhou, J.; Mo, Y.; Li, X.; Berger, S.L.; Allis, C.D.; Marmorstein, R.** Structure of Tetrahymena GCN5 bound to coenzyme A and a histone H3 peptide. *Nature* **401** (6748) 1999. pp. 93-97.
- Ronchi, A.; Berry, M.; Raguez, S.; Imam, A.; Yannoutsos, N.; Ottolenghi, S.; Grosfeld, F.; Dillon, N.A.** Role of the duplicated CCAAT box region in gamma-globin gene regulation and hereditary persistence of fetal haemoglobin. *EMBO J* **15** (1) 1996. pp. 143-149.
- Ross, I.L.; Brown, C.M.; Hume, D.A.** Transcription of individual genes in eukaryotic cells occurs randomly and infrequently. *Immunol Cell Biol* **72** 1994. pp. 177-185.
- Rountree, M.R.; Bachman, K.E.; Baylin, S.B.** DNMT1 binds HDAC2 and a new co-repressor, DMAP1, to form a complex at replication foci. *Nature Genet* **25** (3) 2000. pp. 269-277.
- Rubnitz, J.E.; Behm, F.G.; Downing, J.R.** 11q23 rearrangements in acute leukemia. *Leukemia* **10** (1) 1996. pp. 74-82.
- Rundlett, S.E.; Carman, A.A.; Kobayashi, R.; Bavykin, S.; Turner, B.M.; Grunstein, M.** HDA1 and RPD3 are members of distinct yeast histone deacetylase complexes that regulate silencing and transcription. *Proc Natl Acad Sci U S A* **93** (25) 1996. pp. 14503-14508.
- Ryan, T.M.; Behringer, R.R.; Townes, T.M.; Palmer, R.D.; Brinster, R.L.** High-level erythroid expression of human alpha-globin genes in transgenic mice. *Proc Natl Acad Sci U S A* **86** (1) 1989. pp. 37-41.
- Sabath, D.E.; Koehler, K.M.; Yang, W.Q.; Patton, K.; Stamatoyannopoulos, G.** Identification of a major positive regulatory element located 5' to the human zeta-globin gene. *Blood* **85** (9) 1995. pp. 2587-2597.
- Sabath, D.E.; Spangler, E.A.; Rubin, E.M.; Stamatoyannopoulos, G.** Analysis of the human zeta-globin gene promoter in transgenic mice. *Blood* **82** (9) 1993. pp. 2899-2905.
- Saitoh, S.; Wada, T.** Parent-of-origin specific histone acetylation and reactivation of a key imprinted gene locus in Prader-Willi syndrome. *Am J Hum Genet* **6** (66) 2000. pp. 1958-1962.
- Sambrook, J.; Fritsch, E.F.; Maniatis, T.** *Molecular Cloning: A Laboratory Manual* 2nd Edition. 1989. pp. ?-?.
- Sanchez, M.J.; Holmes, A.; Miles, C.; Dzierzak, E.** Characterization of the first definitive hematopoietic stem cells in the AGM and liver of the mouse embryo. *Immunity* **5** (6) 1996. pp. 513-525.
- Satijn, D.P.E.; Otte, A.P.** Polycomb group protein complexes: do different complexes regulate distinct target genes? *Biochim Biophys Acta* **1447** (1) 1999. pp. 1-16.
- Saurin, A.J.; Shao, Z.; Erdjument-Bromage, H.; Tempst, P.; Kingston, R.E.** A Drosophila Polycomb group complex includes Zeste and dTAFII proteins. *Nature* **412** (6847) 2001. pp. 655-660.
- Sawado, T.; Igarashi, K.; Groudine, M.** Activation of beta-major globin gene transcription is associated with recruitment of NF-E2 to the beta-globin LCR and gene promoter. *Proc Natl Acad Sci U S A* **98** (18) 2001. pp. 10226-10231.
- Schedl, A.; Beermann, F.; Thies, E.; Montoliu, L.; Kelsey, G.; Schutz, G.** Transgenic mice generated by pronuclear injection of a yeast artificial chromosome. *Nucleic Acids Res* **20** (12) 1992. pp. 3073-3077.
- Scheidereit, C.; Heguy, A.; Roeder, R.G.** Identification and purification of a human lymphoid-specific octamer-binding protein (OTF-2) that activates transcription of an immunoglobulin promoter in vitro. *Cell* **51** (5) 1987. pp. 783-793.
- Schoenherr, C.J.; Tilghman, S.M.** *Chromatin and gene structure* 2000. pp. 252-277.
- Schubeler, D.; Francastel, C.; Cimbara, D.; Reik, A.; Martin, D.I.; Groudine, M.** Nuclear localization and histone acetylation: a pathway for chromatin opening and transcriptional activation of the human beta-globin locus. *Genes Dev* **14** (8) 2000. pp. 940-950.
- Senitzer, G.; Sif, S.; Kingston, R.E.** Human SWISNF interconverts a nucleosome between its base state and a stable remodeled state. *Cell* **94** (1) 1998. pp. 17-27.
- Sewack, G.F.; Ellis, T.W.; Hansen, U.** Binding of TATA binding protein to a naturally positioned nucleosome is facilitated by histone acetylation. *Mol Cell Biol* **21** (4) 2001. pp. 1404-1415.
- Shao, Z.; Raible, F.; Mollaaghatababa, R.; Guyon, J.R.; Wu, C.T.; Bender, W.; Kingston, R.E.** Stabilization of chromatin structure by PRC1, a Polycomb complex. *Cell* **98** (1) 1999. pp. 37-46.
- Shen, X.; Mizuguchi, G.; Hamiche, A.; Wu, C.** A chromatin remodelling complex involved in transcription and DNA processing. *Nature* **406** (6795) 2000. pp. 541-544.
- Shewchuk, B.M.; Hardison, R.C.** CpG islands from the alpha-globin gene cluster increase gene expression in an integration-dependent manner. *Mol Cell Biol* **17** (10) 1997. pp. 5856-5866.

- Shih, D.M.; Wall, R.J.; Shapiro, S.G.** Developmentally regulated and erythroid-specific expression of the human embryonic beta-globin gene in transgenic mice. *Nucleic Acids Res* **18** (18) 1990. pp. 5465-5472.
- Shilatifard, A.; Conaway, J.W.; Conaway, R.C.** Mechanism and regulation of transcriptional elongation and termination by RNA polymerase II. *Curr Opin Genetics Dev* **7** (2) 1997. pp. 199-204.
- Shivdasani, R.; Orkin, S.H.** Erythropoiesis and globin gene expression in mice lacking the transcription factor NF-E2. *Proc Natl Acad Sci U.S.A* **92** (19) 1995. pp. 8690-8694.
- Shivdasani, R.; Rosenblatt, M.F.; Zucker-Franklin, D.; Jackson, C.W.; Hunt, P.; Saris, C.J.M.; Orkin, S.H.** Transcription factor NF-E2 is required for platelet formation independent of the actions of thrombopoietin/MGDF in megakaryocyte development. *Cell* **81** (5) 1995. pp. 695-704.
- Shizuya, H.; Birren, B.; Kim, U-J; Mancino, V.; Slepak, T.** Cloning and stable maintenance of 300-kilobase-pair fragments of human DNA in Escherichia coli using an F-factor-based vector. *Proc Natl Acad Sci U.S.A* **89** (18) 1992. pp. 8794-8797.
- Shulman, M.J.; Wu, G.E.** Hypothesis: genes which function in a stochastic lineage commitment process are subject to monoallelic expression. *Semin Immunol* **11** (5) 1999. pp. 369-371.
- Simon, J.A.; Tamkun, J.W.** Programming off and on states in chromatin: mechanisms of Polycomb and trithorax group complexes. *Curr Opin Genetics Dev* **12** (2) 2002. pp. 210-218.
- Simon, J.A.** Locking in stable states of gene expression: transcriptional control during Drosophila development. *Curr Opin Cell Biol* **7** (3) 1995. pp. 376-385.
- Skalnik, D.G.; Strauss, E.C.; Orkin, S.H.** CCAAT displacement protein as a repressor of the myelomonocytic-specific gp91-phox gene promoter. *J Biol Chem* **266** (25) 1991. pp. 16736-16744.
- Smith, R.D.; Yu, J.; Seale, R.L.** Chromatin structure of the beta-globin gene family in murine erythroleukemia cells. *Biochemistry* **23** (4) 1984. pp. 785-790.
- Sorrentino, B.; Ney, P.; Bodine, D.; Nienhuis, A.W.** Inducibility of the HS II enhancer depends on binding of an erythroid specific nuclear protein. *Nucleic Acids Res* **18** (20) 1990. pp. 2721-2731.
- Soultanas, P.; Kosteas, T.; Anagnou, N.P.** YY1 binds to multiple sites of a silencer element located 1.6 kb 3' to the fetal Agamma-globin gene. *Blood* **88** 1996. pp. 147a-147a.
- Southwood, C.M.; Downs, K.M.; Bieker, J.J.** Erythroid Kruppel-like factor exhibits an early and sequentially localized pattern of expression during mammalian erythroid ontogeny. *Dev Dyn* **206** (3) 1996. pp. 248-259.
- Spencer, F.; Ketner, G.; Connelly, C.; Heiter, P.** Targeted recombination-based cloning and manipulation of large DNA segments in yeast. *Methods Enzymol* **5** 1993. pp. 161-175.
- Spritz, R.; de Riel, J.; Forget, B.; Weissman, S.** Complete nucleotide sequence of the human delta-globin gene. *Cell* **21** (3) 1980. pp. 639-646.
- Stalder, J.; Larsen, A.; Engel, J.D.; Dolan, M.; Groudine, M.; Weintraub, H.** Tissue-specific DNA cleavages in the globin chromatin domain introduced by DNase I. *Cell* **20** (2) 1980. pp. 451-460.
- Stamatoyannopoulos, G.; Grosveld, F.** *The molecular Basis of Blood Diseases* 2001. pp. 135-182.
- Stamatoyannopoulos, G.; Nienhuis, A.W.** Hemoglobin switching: the molecular basis of blood diseases 1996. pp. ?-?.
- Stamatoyannopoulos, G.; Wood, W.G.; Papayannopoulou, T.; Nute, P.E.** A new form of hereditary persistence of fetal hemoglobin in blacks and its association with sickle cell trait. *Blood* **46** (5) 1975. pp. 683-692.
- Stamatoyannopoulos, G.; Josephson, B.; Zhang, J.W.; Li, Q.** Developmental regulation of human gamma-globin genes in transgenic mice. *Mol Cell Biol* **13** (12) 1993. pp. 7636-7644.
- Stamatoyannopoulos, G.; Clegg, C.H.; Li, Q.** Sheltering of gamma-globin expression from position effects requires both an upstream locus control region and a regulatory element 3' to the A gamma-globin gene. *Mol Cell Biol* **17** (1) 1997. pp. 240-240.
- Stamatoyannopoulos, G.; Goodwin, A.J.; Joyce, T.M.; Lowrey, C.H.** *Molecular Biology of Hemoglobin switching* 1995. pp. 71-86.
- Stern, D.E.; Berger, S.L.** Acetylation of histones and transcription-related factors. *Microbiol Mol Biol Rev* **64** (2) 2000. pp. 435-459.
- Stern, R.; Vidali, G.; Allfrey, V.G.** Studies of acetylation and deacetylation in high mobility group proteins. Identification of the sites of acetylation in HMG-1. *J Biol Chem* **254** (22) 1979. pp. 11577-11583.
- Stomming, T.A.; Stomming, G.S.; Lancelot, K.D.; Fei, Y.I.; Altay, C.; Kultar, F.; Huisman, T.H.J.** An A gamma type of nondeletional hereditary persistence of fetal hemoglobin with a T----C mutation at position -175 to the cap site of the A gamma globin gene. *Blood* **73** (1) 1989. pp. 329-333.
- Strahl, B.; Allis, C** The language of covalent histone modifications *Nature* **403** (6765) 2000. pp. 41-45.
- Strauss, E.C.; Orkin, S.H.** In vivo protein-DNA interactions at hypersensitive site 3 of the human beta-globin locus control region. *Proc Natl Acad Sci U.S.A* **89** (13) 1992. pp. 5809-5813.
- Strauss, E.C.; Andrews, N.C.; Higgs, D.R.; Orkin, S.H.** In vivo footprinting of the human alpha-globin locus upstream regulatory element by guanine and adenine ligation-mediated polymerase chain reaction. *Mol Cell Biol* **12** (5) 1992. pp. 2135-2143.
- Strouboulis, J.; Dillon, N.; Grosveld, F.** Developmental regulation of a complete 70-kb human beta-globin locus in transgenic mice. *Genes Dev* **6** (10) 1992. pp. 1857-1864.
- Studitsky, V.M.; Clark, D.J.; Felsenfeld, G.** Overcoming a nucleosomal barrier to transcription. *Cell* **83** (1) 1995. pp. 19-27.
- Sturm, R.A.; Das, G.; Herr, W.** The ubiquitous octamer-binding protein Oct-1 contains a POU domain with a homeo box subdomain. *Genes Dev* **2** (12) 1988. pp. 1582-1599.
- Sudarnasam, P.; Iyer, V.R.; Brown, P.O.; Winston, F.** Whole-genome expression analysis of snfswi mutants of *Saccharomyces cerevisiae*. *Proc Natl Acad Sci U.S.A* **97** (7) 2000. pp. 3364-3369.
- Sun, F.L.; Cuaycong, M.H.; Elgin, S.C.R.** Long-range nucleosome ordering is associated with gene silencing in *Drosophila melanogaster* pericentric heterochromatin. *Mol Cell Biol* **21** (8) 2001. pp. 2867-2879.
- Surrey, S.; Delgrossi, K.; Malladi, P.; Schwartz, E.** A single-base change at position -175 in the 5'-flanking region of the G gamma-globin gene from a black with G gamma-beta+ HPFH. *Blood* **71** (3) 1988. pp. 807-810.
- Svaren, J.; Horz, W.** Regulation of gene expression by nucleosomes. *Genes Dev* **6** (2) 1996. pp. 164-170.
- Svaren, J.; Horz, W.** Transcription factors vs nucleosomes: regulation of the PHO5 promoter in yeast. *Trends Biochem Sci* **22** (3) 1997. pp. 93-97.
- Swendeman, S.L.; Spielholz, C.; Jenkins, N.A.; Gilbert, D.J.; Copeland, N.G.; Sheffery, M.** Characterization of the genomic structure, chromosomal location, promoter, and development expression of the alpha-globin transcription factor CP2. *J Biol Chem* **269** (15) 1994. pp. 11663-11671.
- Tachibana, M.; Sugimoto, K.; Fukushima, T.; Shinkai, Y.** Set domain-containing protein, G9a, is a novel lysine-prefering mammalian histone methyltransferase with hyperactivity and specific selectivity to lysines 9 and 27 of histone H3. *J Biol Chem* **276** (27) 2001. pp. 25309-25317.
- Taddei, A.; Maison, C.; Roche, D.; Almouzni G.,** Reversible disruption of pericentric heterochromatin and centromere function by inhibiting deacetylases. *Nature Cell Biol* **3** (2) 2001. pp. 114-120.

- Takemura, R.; Okabe, S.; Umeyama, T.; Kanai, Y.; Cowan, N.J.; Hirokawa, N.** Increased microtubule stability and alpha tubulin acetylation in cells transfected with microtubule-associated proteins MAP1B, MAP2 or tau. *J Cell Sci* **103** 1992. pp. 953-964.
- Talbot, D.; Collis, P.; Antoniou, M.; Vidal, M.; Grosveld, F.; Greaves, D.R.** A dominant control region from the human beta-globin locus conferring integration site-independent gene expression. *Nature* **338** (6213) 1989. pp. 352-355.
- Talbot, D.; Philipsen, S.; Fraser, P.; Grosveld, F.** Detailed analysis of the site 3 region of the human beta-globin dominant control region. *EMBO J* **9** (7) 1990. pp. 2169-2177.
- Talbot, D.; Grosveld, F.** The 5'HS2 of the globin locus control region enhances transcription through the interaction of a multimeric complex binding at two functionally distinct NF-E2 binding sites. *EMBO J* **10** (6) 1991. pp. 1391-1398.
- Tanabe, O.; Katsuoka, F.; Campbell, A.D.; Song, W.; Yamamoto, M.; Tanimoto, K.; Engel, J.D.** An embryonic fetal beta-type globin gene repressor contains a nuclear receptor TR2/TR4 heterodimer. *EMBO J* **21** (13) 2002. pp. 3434-3442.
- Tanamachi, D.M.; Hanke, T.; Takizawa, H.; Jamieson, A.M.; Raulet, D.H.** Expression of natural killer receptor alleles at different Ly49 loci occurs independently and is regulated by major histocompatibility complex class I molecules. *J Exp Med* **193** (3) 2001. pp. 307-315.
- Tanese, N.; Pugh, B.F.; Tjian, R.** Coactivators for a proline-rich activator purified from the multisubunit human TFIID complex. *Genes Dev* **5** (12) 1991. pp. 2212-224.
- Tang, D.C.; Ebb, D.; Hardison, R.C.; Rodgers, G.P.** Restoration of the CCAAT box or insertion of the CACCC motif activates [corrected] delta-globin gene expression. *Blood* **90** (1) 1997. pp. 421-427.
- Tanimoto, K.; Liu, Q.; Bungert, J.; Engel, J.D.** Effects of altered gene order or orientation of the locus control region on human beta-globin gene expression in mice. *Nature* **398** (6725) 1999. pp. 344-348.
- Tanimoto, K.; Liu, Q.; Grosveld, F.; Bungert, F.; Engel, J.D.** Context-dependent EKLF responsiveness defines the developmental specificity of the human epsilon-globin gene in erythroid cells of YAC transgenic mice. *Genes Dev* **14** (21) 2000. pp. 2778-2794.
- Taramelli, R.; Kioussis, D.; Vanin, E.; Bartram, K.; Groffen, J.; Hurst, J.; Grosveld, F.** Gamma delta beta-thalassaealias 1 and 2 are the result of a 100 kbp deletion in the human beta-globin cluster. *Nucleic Acids Res* **14** (17) 1986. pp. 7017-7029.
- Taunton, J.; Hassig, C.A.; Schreiber, S.L.** A mammalian histone deacetylase related to the yeast transcriptional regulator Rpd3p. *Science* **272** (5260) 1996. pp. 408-411.
- Terrell, A.R.; Wongwisantri, S.; Pilon, J.L.; Laybourn, P.J.** Reconstitution of nucleosome positioning, remodeling, histone acetylation, and transcriptional activation on the PHO5 promoter. *J Biol Chem* **10** (34) 2002. pp. 31038-31047.
- Tewari, R.; Gillemans, N.; Wijgerde, M.; Nuez, B.; van Lindren, M.; Grosveld, F.; Philipsen, S.** Erythroid Kruppel-like factor (EKLF) is active in primitive and definitive erythroid cells and is required for the function of 5'HS3 of the beta-globin locus control region. *EMBO J* **17** (8) 1998. pp. 2334-2341.
- Thein, S.L.** *Baillieres Clinical Haematology* 1993. pp. 151-175.
- Tie, F.; Furuyama, T.; Prasad-Sinha, J.; Jane, E.; Harte, P.J.** The Drosophila Polycomb Group proteins ESC and E(Z) are present in a complex containing the histone-binding protein p55 and the histone deacetylase RPD3. *Development* **128** (2) 2001. pp. 275-286.
- Tilib, S.; Petruk, S.; Sedkov, Y.; Kuzin, A.; Fujioka, M.; Goto, T.; Mazo, A.** Trithorax- and Polycomb-group response elements within an Ultrabithorax transcription maintenance unit consist of closely situated but separable sequences. *Mol Cell Biol* **19** (7) 1999. pp. 5189-5202.
- Tong, J.K.; Hassig, C.A.; Schnitzler, G.R.; Kingston, R.E.; Schreiber, S.L.** Chromatin deacetylation by an ATP-dependent nucleosome remodelling complex. *Nature* **395** (6705) 1998. pp. 917-921.
- Townes, T.M.; Lingrel, J.B.; Chen, H.Y.; Brinster, R.L.; Palmiter, R.D.** Erythroid-specific expression of human beta-globin genes in transgenic mice. *EMBO J* **4** (7) 1985. pp. 1715-1723.
- Trainor, C.D.; Evans, T.; Felsenfeld, G.; Boguski, M.S.** Structure and evolution of a human erythroid transcription factor. *Nature* **343** (6253) 1990. pp. 92-96.
- Tramelli, R.; Kioussis, D.; Vanin, E.; Bartram, K.; Groffen, J.; Hurst, J.; Grosveld, F.G.** Gamma delta beta-thalassaealias 1 and 2 are the result of a 100 kbp deletion in the human beta-globin cluster. *Nucleic Acids Res* **14** (17) 1986. pp. 7017-7029.
- Trepicchio, W.L.; Dyer, M.A.; Baron, M.H.** Developmental regulation of the human embryonic beta-like globin gene is mediated by synergistic interactions among multiple tissue- and stage-specific elements. *Mol Cell Biol* **13** (12) 1993. pp. 7457-7468.
- Trimborn, T.; Gribnau, J.; Grosveld, F.; Fraser, P.** Mechanisms of developmental control of transcription in the murine alpha- and beta-globin loci. *Genes Dev* **13** (1) 1999. pp. 112-124.
- Trudel, M.; Costantini, F.** A 3' enhancer contributes to the stage-specific expression of the human beta-globin gene. *Genes Dev* **1** (9) 1987. pp. 954-961.
- Trudel, M.; Magram, J.; Bruckner, L.; Costantini, F.** Upstream G gamma-globin and downstream beta-globin sequences required for stage-specific expression in transgenic mice. *Mol Cell Biol* **7** (11) 1987. pp. 4024-4029.
- Tsai, S.; Martin, D.; Zon, L.; D'Andrea, A.; Wong, G.; Orkin, S.** Cloning of cDNA for the major DNA-binding protein of the erythroid lineage through expression in mammalian cells. *Nature* **339** (6224) 1989. pp. 446-451.
- Tsang, A.P.; Visvader, J.E.; Turner, C.A.; Fujiwara, Y.; Yu, C.; Weiss, M.J.; Crossley, M.; Orkin, S.H.** FOG, a multitype zinc finger protein, acts as a cofactor for transcription factor GATA-1 in erythroid and megakaryocytic differentiation. *Cell* **90** (1) 1997. pp. 109-119.
- Tsang, A.P.; Fujiwara, Y.; Hom, D.B.; Orkin, S.H.** Failure of megakaryopoiesis and arrested erythropoiesis in mice lacking the GATA-1 transcriptional cofactor FOG. *Genes Dev* **12** (8) 1998. pp. 1176-1188.
- Tsukiyama, T.; Wu, C.** Chromatin remodeling and transcription. *Curr Opin Genetics Dev* **7** (2) 1997. pp. 182-191.
- Tsukiyama, T.; Wu, C.** Purification and properties of an ATP-dependent nucleosome remodeling factor. *Cell* **83** (6) 1995. pp. 1011-1020.
- Tsukiyama, T.; Becker, P.B.; Wu, C.** ATP-dependent nucleosome disruption at a heat-shock promoter mediated by binding of GAGA transcription factor. *Nature* **367** (6463) 1994. pp. 525-532.
- Tsukiyama, T.; Daniel, C.; Tamkun, J.; Wu, C.** ISWI, a member of the SWI2SNF2 ATPase family, encodes the 140 kDa subunit of the nucleosome remodeling factor. *Cell* **83** (6) 1995. pp. 1021-1026.
- Tuan, D.; Solomon, W.; Li, Q.; London, I.M.** The beta-like-globin gene domain in human erythroid cells. *Proc Natl Acad Sci U S A* **82** (19) 1985. pp. 6384-6388.
- Tuan, D.; Solomon, W.B.; London, I.M.; Lee, D.P.** An erythroid-specific, developmental-stage-independent enhancer far upstream of the human beta-like globin genes. *Proc Natl Acad Sci U S A* **86** (8) 1989. pp. 2554-2558.
- Tuan, D.; Kong, S.; Hu, K.** Transcription of the hypersensitive site HS2 enhancer in erythroid cells. *Proc Natl Acad Sci U S A* **89** (23) 1992. pp. 11219-11223.
- Turner, B.M.; Birley, A.J.; Lavender, J.** Histone H4 isoforms acetylated at specific lysine residues define individual chromosomes and chromatin domains in Drosophila polytene nuclei. *Cell* **69** (2) 1992. pp. 375-384.
- Turner, B.M.** Histone acetylation and an epigenetic code. *Bioessays* **22** (9) 2000. pp. 836-845.
- Ugrinova, I.; Pasheva, E.A.; Armengaud, J.; Pashev, I.G.** In vivo acetylation of HMG1 protein enhances its binding affinity to distorted DNA structures. *Biochemistry* **48** (40) 2001. pp. 14655-14660.
- Utley, R.T.; Ikeda, K.; Grant, P.A.; Cote, J.; Steger, D.J.; Eberharter, A.; John, S.; Workman, J.L.** Transcriptional activators direct histone acetyltransferase complexes to nucleosomes. *Nature* **394** (6692) 1998. pp. 498-502.

- van de Corput, M.P.C.; Grosveld, F.** Fluorescence in situ hybridization analysis of transcript dynamics in cells. *Methods* **25 (1)** 2001. pp. 111-118.
- van der Ploeg, L.H.; Konings, A.; Oort, M.; Roos, D.; Bernini, L.; Flavell, R.A.** gamma-beta-Thalassaemia studies showing that deletion of the gamma- and delta-genes influences beta-globin gene expression in man. *Nature* **283 (5748)** 1980. pp. 637-642.
- van der Ploeg, L.H.T.; Flavell, R.A.** DNA methylation in the human gamma delta beta-globin locus in erythroid and nonerythroid tissues. *Cell* **19 (4)** 1980. pp. 947-958.
- van der Vlag, J.; Otte, A.P.** Transcriptional repression mediated by the human polycomb-group protein EED involves histone deacetylation. *Nature Genet* **23 (4)** 1999. pp. 474-478.
- van Holde, K.E.** chromatin 1989. pp. ?-?.
- van Lohuizen, M.; Verbeek, S.; Scheijen, B.; Wientjens, E.; van der Gulden, H.; Berns, A.** Identification of cooperating oncogenes in E mu-myc transgenic mice by provirus tagging. *Cell* **65 (5)** 1991. pp. 737-752.
- van Raamsdonk, C.D.; Tilghman, S.M.** Optimizing the detection of nascent transcripts by RNA fluorescence in situ hybridization. *Nucleic Acids Res* **29 (8)** 2001. pp. E42-E42.
- Varga-Weisz, P.D.; Wilm, M.; Bonte, E.J.; Dumas, K.; Mann, M.; Becker, P.B.** Chromatin-remodelling factor CHRAC contains the ATPases ISWI and topoisomerase II. *Nature* **388 (6642)** 1997. pp. 598-602.
- Varshavsky, A.J.; Bakayev, V.V.; Georgiev, G.P.** Minichromosome of simian virus 40: presence of histone HI. *Nucleic Acids Res* **3 (8)** 1976. pp. 477-492.
- Verdel, A.; Khochbin, S.** Identification of a new family of higher eukaryotic histone deacetylases. Coordinate expression of differentiation-dependent chromatin modifiers. *J Biol Chem* **274 (4)** 1999. pp. 2440-2445.
- Vettesse-Dadey, M.; Grant, P.A.; Hebbes, T.R.; Crane-Robinson, C.; Allis, C.D.; Workman, J.L.** Acetylation of histone H4 plays a primary role in enhancing transcription factor binding to nucleosomal DNA in vitro. *EMBO J* **15 (10)** 1996. pp. 2508-2518.
- Vignali, M.; Hassan, A.H.; Neely, K.E.; Workman, J.L.** ATP-dependent chromatin-remodeling complexes. *Mol Cell Biol* **20 (6)** 2000. pp. 1899-1910.
- Visvader, J.E.; Elefanty, A.G.; Strasser, A.; Adams, J.M.** GATA-1 but not SCL induces megakaryocytic differentiation in an early myeloid line. *EMBO JII (I2)* 1992. pp. 4557-4562.
- Vonlanthen, S.; Heighway, J.; Alternat, H.J.; Gugger, M.; Kappeler, A.; Borner, M.M.; van Lohuizen, M.; Betticher, D.C.** The bmi-1 oncoprotein is differentially expressed in non-small cell lung cancer and correlates with INK4A-ARF locus expression. *Br J Cancer* **84 (10)** 2001. pp. 1372-1376.
- Wakimoto, B.T.** Beyond the nucleosome: epigenetic aspects of position-effect variegation in Drosophila. *Cell* **93 (3)** 1998. pp. 321-324.
- Wall, L.; Destroismaisons, N.; Delvoye, N.; Guy, L.G.** CAATenhancer-binding proteins are involved in beta-globin gene expression and are differentially expressed in murine erythroleukemia and K562 cells. *J Biol Chem* **271 (28)** 1996. pp. 16477-16488.
- Wallberg, A.E.; Neely, K.E.; Hassan, A.H.; Gustafsson, J.A.; Workman, J.L.; Wright, A.P.** Recruitment of the SWI-SNF chromatin remodeling complex as a mechanism of gene activation by the glucocorticoid receptor tau1 activation domain. *Mol Cell Biol* **20 (6)** 2000. pp. 2004-2013.
- Wallrath, L.L.; Elgin, S.C.R.** Position effect variegation in Drosophila is associated with an altered chromatin structure. *Genes Dev* **9 (10)** 1995. pp. 1263-1267.
- Wallrath, L.L.** Unfolding the mysteries of heterochromatin. *Curr Opin Genetics Dev* **8 (2)** 1998. pp. 147-153.
- Walters, M.; Martin, D.I.K.** Functional erythroid promoters created by interaction of the transcription factor GATA-1 with CACCC and AP-1NE-2 elements. *Proc Natl Acad Sci U S A* **89 (21)** 1992. pp. 104444-104448.
- Walters, M.; Kim, C.; Gelinas, R.** Characterization of a DNA binding activity in DNase I hypersensitive site 4 of the human globin locus control region. *Nucleic Acids Res* **19 (19)** 1991. pp. 5385-5393.
- Walters, M.; Fiering, S.; Eidemiller, J.; Magis, W.; Groudine, M.; Martin, D.I.K.** Enhancers increase the probability but not the level of gene expression. *Proc Natl Acad Sci U S A* **92 (15)** 1995. pp. 7125-7129.
- Walters, M.; Magis, W.; Fiering, S.; Eidemiller, J.; Scalzo, D.; Groudine, M.** Transcriptional enhancers act in cis to suppress position-effect variegation. *Genes Dev* **10 (2)** 1996. pp. 185-195.
- Wang, H.; Huang, Z.Q.; Xia, L.; Feng, Q.; Erdjument-Bromage, H.; Strahl, B.D.; Briggs, S.D.; Allis, C.D.; Wong, J.; Tempst, P.; Zhang, Y.** Methylation of histone H4 at arginine 3 facilitating transcriptional activation by nuclear hormone receptor. *Science* **296 (5531)** 2001. pp. 853-857.
- Wasylk, B.; Wasylk, C.; Augereau, P.; Chambon, P.** The SV40 72 bp repeat preferentially potentiates transcription starting from proximal natural or substitute promoter elements *Cell* **32 (2)** 1983. pp. 503-514.
- Watt, P.; Lamb, P.; Squire, L.; Proudfoot, N.** A factor binding GATAAG confers tissue specificity on the promoter of the human zeta-globin gene. *Nucleic Acids Res* **18 (6)** 1990. pp. 1339-1350.
- Weatherall, D.J.** *The Molecular Basis of Blood Diseases* 2001. pp. 183-226.
- Weintraub, H.; Groudine, M.** Chromosomal subunits in active genes have an altered conformation. *Science* **193 (4256)** 1976. pp. 848-856.
- Weintraub, H.** Formation of stable transcription complexes as assayed by analysis of individual templates. *Proc Natl Acad Sci U S A* **85 (16)** 1988. pp. 5819-5823.
- Weiss, M.J.; Keller, G.; Orkin, S.H.** Novel insights into erythroid development revealed through in vitro differentiation of GATA-1 embryonic stem cells. *Genes Dev* **8 (10)** 1994. pp. 1184-1197.
- Weiss, M.J.; Yu, C.; Orkin, S.H.** Erythroid-cell-specific properties of transcription factor GATA-1 revealed by phenotypic rescue of a gene-targeted cell line. *Mol Cell Biol* **17 (3)** 1997. pp. 1642-1651.
- Whitehouse, I.; Flaus, A.; Cairns, B.R.; White, M.F.; Workman, J.L.; Owen-Hughes, T.** Nucleosome mobilization catalysed by the yeast SWISNF complex. *Nature* **400 (6746)** 1999. pp. 784-787.
- Whyatt, D.J.; Karis, A.; Harkes, I.C.; Verkerk, A.; Gillemans, N.; Elefanty, A.G.; Vairo, G.; Poemacher, R.; Grosveld, F.; Philipsen, S.** The level of the tissue-specific factor GATA-1 affects the cell-cycle machinery. *Genes Funct* **1 (1)** 1997. pp. 11-24.
- Whyatt, D.J.; Lindeboom, F.; Karis, A.; Ferreira, R.; Milot, E.; Hendriks, R.; de Brujin, M.; Langeveld, A.; Gribnau, J.; Grosveld, F.; Philipsen, S.** An intrinsic but cell-nonautonomous defect in GATA-1-overexpressing mouse erythroid cells. *Nature* **406 (6795)** 2000. pp. 519-524.
- Wijgerde, M.; Gribnau, J.; Trimborn, T.; Nuez, B.; Philipsen, S.; Grosveld, F.; Fraser, P.** The role of EKLF in human beta-globin gene competition. *Genes Dev* **10 (22)** 1996. pp. 2894-2902.
- Wijgerde, M.; Grosveld, F.; Fraser, P.** Transcription complex stability and chromatin dynamics in vivo. *Nature* **377 (6546)** 1995. pp. 209-213.
- Wilson, C.J.; Chao, D.M.; Imbalzano, A.N.; Schnitzler, G.R.; Kingston, R.E.; Young, R.A.** RNA polymerase II holoenzyme contains SWISNF regulators involved in chromatin remodeling. *Cell* **84 (2)** 1996. pp. 235-244.
- Wilson, C.J.; Bellen, H.J.; Gehring, W.J.** Position effects on eukaryotic gene expression. *Annu Rev Cell Biol* **6** 1990. pp. 679-714.
- Winston, F.; Carlson, M.** Yeast SNFSWI transcriptional activators and the SPT5IN chromatin connection. *Trends Genet* **8 (II)** 1992. pp. 387-391.

- Wintrobe, M.M.; Schumacker, H.B.** - *J Clin Invest* **14** 1935. pp. 837-837.
- Wolffe, A.P.** *San Diego: Academic Press* 1998. pp. ?-?.
- Wood, W.G.** *Baillieres Clinical Haematology* 1993. pp. 177-213.
- Wood, W.G.** *Baillieres Clinical Haematology* 1993. pp. 177-213.
- Wood, W.I.; Felsenfeld, G.** Chromatin structure of the chicken beta-globin gene region. Sensitivity to DNase I, micrococcal nuclease, and Dnase II. *J Biol Chem* **257** (13) 1982. pp. 7730-7736.
- Wu, C.; Binham, P.M.; Livak, K.J.; Holmgren, R.; Elgin, S.C.R.** The chromatin structure of specific genes: I. Evidence for higher order domains of defined DNA sequence. *Cell* **16** (4) 1979. pp. 797-806.
- Xiao, H.; Sandaltzopoulos, R.; Wang, H.M.; Hamiche, A.; Ranallo, R.; Lee, K.M.; Fu, D.; Wu, C.** Dual functions of largest NURF subunit NURF301 in nucleosome sliding and transcription factor interactions. *Mol Cell* **8** (3) 2001. pp. 1-20.
- Yang, L.; Xia, L.; Wu, D.Y.; Wang, H.; Chansky, H.A.; Schubach, W.H.; Hickstein, D.D.; Zhang, Y.** Molecular cloning of ESET, a novel histone H3-specific methyltransferase that interacts with ERG transcription factor. *J Biol Chem* **21** (1) 2002. pp. 148-152.
- Yang, X.W.; Model, P.; Heintz, N.** Homologous recombination based modification in Escherichia coli and germline transmission in transgenic mice of a bacterial artificial chromosome. *Nature Biotechnol* **15** (9) 1997. pp. 859-865.
- Yannoutsos, N.; IJzerman, J.N.M.; Harkes, C.; Bonhuis, F.; Zhou, C-Y.; White, D.; Marquet, R.L.M.; Grosveld, F.** A membrane cofactor protein transgenic mouse model for the study of discordant xenograft rejection. *Genes Cells* **1** (4) 1996. pp. 409-419.
- Yokata, H.; van den Engh, G.; Hearst, J.E.; Sachs, R.K.; Trask, B.J.** Evidence for the organization of chromatin in megabase pair-sized loops arranged along a random walk path in the human G0G1 interphase nucleus. *J Cell Biol* **130** (6) 1995. pp. 1239-1249.
- Yu, C.Y.; Motamed, K.; Chen, J.; Bailey, A.; Shen, C.K.J.** The CACC box upstream of human embryonic epsilon globin gene binds Sp1 and is a functional promoter element in vitro and in vivo. *J Biol Chem* **266** (14) 1991. pp. 8907-8915.
- Yu, C.Y.; Chen, J.; Lin, L.I.; Tam, M.; Shen, C.K.** Cell type-specific protein-DNA interactions in the human zeta-globin upstream promoter region: displacement of Sp1 by the erythroid cell-specific factor NF-E1. *Mol Cell Biol* **10** (1) 1990. pp. 282-294.
- Zafarana, G.; Raguez, S.; Pruzina, S.; Grosveld, F.; Meijer, D.** *Developmental Control of Globin Genes* 1995. pp. 39-39.
- Zafarana, G.; Rottier, R.; Grosveld, F.; Philipsen, S.** Erythroid expression of CEBP γ in transgenic mice affects g-globin expression and fetal liver erythropoiesis *EMBO J* **19** (21) 2000. pp. 5856-5863.
- Zawel, L.; Reinberg, D.** Initiation of transcription by RNA polymerase II: a multi-step process. *Prog Nucleic Acid Res Mol Biol* **44** 1993. pp. 67-108.
- Zenke, M.; Grundstrom, T.; Matthes, H.; Wintzerith, M.; Schatz, C.; Wildeman, A.; Chambon, P.** Multiple sequence motifs are involved in SV40 enhancer function. *EMBO J* **5** (2) 1986. pp. 387-397.
- Zhan, H.C.; Liu, D.P.; Liang, C.C.** Insulator: from chromatin domain boundary to gene regulation. *Hum Genet* **109** (5) 2001. pp. 471-478.
- Zhang, Q.; Reddy, P.M.; Yu, C.Y.; Basiani, C.; Higgs, D.; Stamatoyannopoulos, G.; Papayannopoulou, T.; Shen, C.K.** Transcriptional activation of human zeta 2 globin promoter by the alpha globin regulatory element (HS-40): functional role of specific nuclear factor-DNA complexes. *Mol Cell Biol* **13** (4) 1993. pp. 2298-2308.
- Zhang, W.; Bieker, J.J.** Acetylation and modulation of erythroid Kruppel-like factor (EKLF) activity by interaction with histone acetyltransferases. *Proc Natl Acad Sci U S A* **95** (17) 1998. pp. 9855-9860.
- Zhang, Y.; LeRoy, G.; Seelig, H.P.; Lane, W.S.; Reinberg, D.** The dermatomyositis-specific autoantigen Mi2 is a component of a complex containing histone deacetylase and nucleosome remodeling activities. *Cell* **95** (2) 1998. pp. 279-289.
- Zhang, Y.; Buchholz, F.; Muyrers, J.P.P.; Stewart, A.F.** A new logic for DNA engineering using recombination in Escherichia coli. *Nature Genet* **20** (2) 1998. pp. 123-128.
- Zhang, Z.; Ling, C.; Wang, S.; Gaensler, K.M.L.** Globin gene switching in beta-globin YAC transgenic with a 12.5kb deletion of the region between the Agamma and delta genes. *Blood* **90** 1997. pp. 129-129.
- Zhang, Y.; Buchholz, F.; Muyrers, J.P.; Stewart, A.F.** A new logic for DNA engineering using recombination in Escherichia coli. *Nature Genet* **20** (2) 1998. pp. 123-128.
- Zhou, Q.; Lieberman, P.M.; Boyer, T.G.; Berk, A.J.** Holo-TFIID supports transcriptional stimulation by diverse activators and from a TATA-less promoter. *Genes Dev* **6** (10) 1992. pp. 1964-1974.
- Zink, D.; Paro, R.** Drosophila Polycomb-group regulated chromatin inhibits the accessibility of a trans-activator to its target DNA. *EMBO J* **14** (22) 1995. pp. 5660-5671.