

## 6 Literatur

- Adams RR, Maiato H, Earnshaw WC, Carmena M (2001) Essential roles of Drosophila inner centromere protein (INCENP) and aurora B in histone H3 phosphorylation, metaphase chromosome alignment, kinetochore disjunction, and chromosome segregation. *J Cell Biol* **153**: 865-880
- Adams RR, Wheatley SP, Gouldsworthy AM, Kandels-Lewis SE, Carmena M, Smythe C, Gerloff DL, Earnshaw WC (2000) INCENP binds the Aurora-related kinase AIRK2 and is required to target it to chromosomes, the central spindle and cleavage furrow. *Curr Biol* **10**: 1075-1078
- Adolphs KW, Cheng SM, Paulson JR, Laemmli UK (1977) Isolation of a protein scaffold from mitotic HeLa cell chromosomes. *Proc Natl Acad Sci U S A* **74**: 4937-4941
- Aebi U, Cohn J, Buhle L, Gerace L (1986) The nuclear lamina is a meshwork of intermediate-type filaments. *Nature* **323**: 560-564
- Alberts B, Johnson A, Lewis J, Raff M, Roberts K, Walter P (eds.). (2002) *Molecular Biology of the Cell*. Garland Publishing, New York.
- Ambros V (2004) The functions of animal microRNAs. *Nature* **431**: 350-355
- Aubin JE, Osborn M, Weber K (1980) Variations in the distribution and migration of centriole duplexes in mitotic PtK2 cells studied by immunofluorescence microscopy. *J Cell Sci* **43**: 177-194
- Auerbach AD, Adler B, Chaganti RS (1981) Prenatal and postnatal diagnosis and carrier detection of Fanconi anemia by a cytogenetic method. *Pediatrics* **67**: 128-135
- Bazett-Jones DP, Kimura K, Hirano T (2002) Efficient supercoiling of DNA by a single condensin complex as revealed by electron spectroscopic imaging. *Mol Cell* **9**: 1183-1190
- Bednar J, Horowitz RA, Grigoryev SA, Carruthers LM, Hansen JC, Koster AJ, Woodcock CL (1998) Nucleosomes, linker DNA, and linker histone form a unique structural motif that directs the higher-order folding and compaction of chromatin. *Proc Natl Acad Sci U S A* **95**: 14173-14178
- Belmont AS, Bruce K (1994) Visualization of G1 chromosomes: a folded, twisted, supercoiled chromonema model of interphase chromatid structure. *J Cell Biol* **127**: 287-302
- Belmont AS, Sedat JW, Agard DA (1987) A three-dimensional approach to mitotic chromosome structure: evidence for a complex hierarchical organization. *J Cell Biol* **105**: 77-92
- Bharadwaj R, Yu H (2004) The spindle checkpoint, aneuploidy, and cancer. *Oncogene* **23**: 2016-2027
- Bolton MA, Lan W, Powers SE, McCleland ML, Kuang J, Stukenberg PT (2002) Aurora B kinase exists in a complex with survivin and INCENP and its kinase activity is stimulated by survivin binding and phosphorylation. *Mol Biol Cell* **13**: 3064-3077
- Bond J, et al (2002) ASPM is a major determinant of cerebral cortical size. *Nat Genet* **32**: 316-320
- Bond J, et al (2005) A centrosomal mechanism involving CDK5RAP2 and CENPJ controls brain size. *Nat Genet* **37**: 353-355
- Bork P, Hofmann K, Bucher P, Neuwald AF, Altschul SF, Koonin EV (1997) A superfamily of conserved domains in DNA damage-responsive cell cycle checkpoint proteins. *Faseb J* **11**: 68-76
- Broers JL, Hutchison CJ, Ramaekers FC (2004) Laminopathies. *J Pathol* **204**: 478-488
- Christensen MO, Larsen MK, Barthelmes HU, Hock R, Andersen CL, Kjeldsen E, Knudsen BR, Westergaard O, Boege F, Mielke C (2002) Dynamics of human DNA topoisomerases IIalpha and IIbeta in living cells. *J Cell Biol* **157**: 31-44

- Ciosk R, Shirayama M, Shevchenko A, Tanaka T, Toth A, Nasmyth K (2000) Cohesin's binding to chromosomes depends on a separate complex consisting of Scc2 and Scc4 proteins. *Mol Cell* **5**: 243-254
- Cohen PT (1997) Novel protein serine/threonine phosphatases: variety is the spice of life. *Trends Biochem Sci* **22**: 245-251
- Collas P, Le Guellec K, Tasken K (1999) The A-kinase-anchoring protein AKAP95 is a multivalent protein with a key role in chromatin condensation at mitosis. *J Cell Biol* **147**: 1167-1180
- Conne B, Stutz A, Vassalli JD (2000) The 3' untranslated region of messenger RNA: A molecular 'hotspot' for pathology? *Nat Med* **6**: 637-641
- Crosio C, Fimia GM, Loury R, Kimura M, Okano Y, Zhou H, Sen S, Allis CD, Sassone-Corsi P (2002) Mitotic phosphorylation of histone H3: spatio-temporal regulation by mammalian Aurora kinases. *Mol Cell Biol* **22**: 874-885
- D'Assoro AB, Lingle WL, Salisbury JL (2002) Centrosome amplification and the development of cancer. *Oncogene* **21**: 6146-6153
- Dundr M, Misteli T, Olson MO (2000) The dynamics of postmitotic reassembly of the nucleolus. *J Cell Biol* **150**: 433-446
- Earnshaw WC, Bernat RL (1991) Chromosomal passengers: toward an integrated view of mitosis. *Chromosoma* **100**: 139-146
- Earnshaw WC, Halligan B, Cooke CA, Heck MM, Liu LF (1985) Topoisomerase II is a structural component of mitotic chromosome scaffolds. *J Cell Biol* **100**: 1706-1715
- Earnshaw WC, Heck MM (1985) Localization of topoisomerase II in mitotic chromosomes. *J Cell Biol* **100**: 1716-1725
- Eide T, Carlson C, Tasken KA, Hirano T, Tasken K, Collas P (2002) Distinct but overlapping domains of AKAP95 are implicated in chromosome condensation and condensin targeting. *EMBO Rep* **3**: 426-432
- el-Alfy M, Turner JP, Nadler NJ, Liu DF, Leblond CP (1994) Subdivision of the mitotic cycle into eleven stages, on the basis of the chromosomal changes observed in mouse duodenal crypt cells stained by the DNA-specific Feulgen reaction. *Anat Rec* **238**: 289-296
- Elbashir SM, Harborth J, Lendeckel W, Yalcin A, Weber K, Tuschl T (2001) Duplexes of 21-nucleotide RNAs mediate RNA interference in cultured mammalian cells. *Nature* **411**: 494-498
- Erard MS, Belenguer P, Caizergues-Ferrer M, Pantaloni A, Amalric F (1988) A major nucleolar protein, nucleolin, induces chromatin decondensation by binding to histone H1. *Eur J Biochem* **175**: 525-530
- Evans PD, Anderson JR, Vallender EJ, Choi SS, Lahn BT (2004a) Reconstructing the evolutionary history of microcephalin, a gene controlling human brain size. *Hum Mol Genet* **13**: 1139-1145
- Evans PD, Anderson JR, Vallender EJ, Gilbert SL, Malcom CM, Dorus S, Lahn BT (2004b) Adaptive evolution of ASPM, a major determinant of cerebral cortical size in humans. *Hum Mol Genet* **13**: 489-494
- Evans PD, Gilbert SL, Mekel-Bobrov N, Vallender EJ, Anderson JR, Vaez-Azizi LM, Tishkoff SA, Hudson RR, Lahn BT (2005) Microcephalin, a gene regulating brain size, continues to evolve adaptively in humans. *Science* **309**: 1717-1720
- Evans T, Rosenthal ET, Youngblom J, Distel D, Hunt T (1983) Cyclin: a protein specified by maternal mRNA in sea urchin eggs that is destroyed at each cleavage division. *Cell* **33**: 389-396
- Fields S, Song O (1989) A novel genetic system to detect protein-protein interactions. *Nature* **340**: 245-246

- Fire A, Xu S, Montgomery MK, Kostas SA, Driver SE, Mello CC (1998) Potent and specific genetic interference by double-stranded RNA in *Caenorhabditis elegans*. *Nature* **391**: 806-811
- Flemming W. (1882) *Zellsubstanz und Zellteilung*. FCW Vogel, Leipzig.
- Furuno N, den Elzen N, Pines J (1999) Human cyclin A is required for mitosis until mid prophase. *J Cell Biol* **147**: 295-306
- Ghadimi BM, Sackett DL, Difilippantonio MJ, Schrock E, Neumann T, Jauho A, Auer G, Ried T (2000) Centrosome amplification and instability occurs exclusively in aneuploid, but not in diploid colorectal cancer cell lines, and correlates with numerical chromosomal aberrations. *Genes Chromosomes Cancer* **27**: 183-190
- Ghosh S, Paweletz N, Schroeter D (1998) Cdc2-independent induction of premature mitosis by okadaic acid in HeLa cells. *Exp Cell Res* **242**: 1-9
- Giet R, Glover DM (2001) Drosophila aurora B kinase is required for histone H3 phosphorylation and condensin recruitment during chromosome condensation and to organize the central spindle during cytokinesis. *J Cell Biol* **152**: 669-682
- Gimenez-Abian JF, Clarke DJ, Devlin J, Gimenez-Abian MI, De la Torre C, Johnson RT, Mullinger AM, Downes CS (2000) Premitotic chromosome individualization in mammalian cells depends on topoisomerase II activity. *Chromosoma* **109**: 235-244
- Gimenez-Abian JF, Clarke DJ, Mullinger AM, Downes CS, Johnson RT (1995) A postprophase topoisomerase II-dependent chromatid core separation step in the formation of metaphase chromosomes. *J Cell Biol* **131**: 7-17
- Gimenez-Abian JF, Sumara I, Hirota T, Hauf S, Gerlich D, de la Torre C, Ellenberg J, Peters JM (2004) Regulation of sister chromatid cohesion between chromosome arms. *Curr Biol* **14**: 1187-1193
- Glover JN, Williams RS, Lee MS (2004) Interactions between BRCT repeats and phosphoproteins: tangled up in two. *Trends Biochem Sci* **29**: 579-585
- Goodpasture C, Bloom SE (1975) Visualization of nucleolar organizer regions in mammalian chromosomes using silver staining. *Chromosoma* **53**: 37-50
- Goto H, et al (1999) Identification of a novel phosphorylation site on histone H3 coupled with mitotic chromosome condensation. *J Biol Chem* **274**: 25543-25549
- Gruber S, Haering CH, Nasmyth K (2003) Chromosomal cohesin forms a ring. *Cell* **112**: 765-777
- Gruenbaum Y, Margalit A, Goldman RD, Shumaker DK, Wilson KL (2005) The nuclear lamina comes of age. *Nat Rev Mol Cell Biol* **6**: 21-31
- Hagstrom KA, Meyer BJ (2003) Condensin and cohesin: more than chromosome compactor and glue. *Nat Rev Genet* **4**: 520-534
- Hakimi MA, Bochar DA, Schmiesing JA, Dong Y, Barak OG, Speicher DW, Yokomori K, Shiekhattar R (2002) A chromatin remodelling complex that loads cohesin onto human chromosomes. *Nature* **418**: 994-998
- Hartwell LH, Weinert TA (1989) Checkpoints: controls that ensure the order of cell cycle events. *Science* **246**: 629-634
- Hendzel MJ, Wei Y, Mancini MA, Van Hooser A, Ranalli T, Brinkley BR, Bazett-Jones DP, Allis CD (1997) Mitosis-specific phosphorylation of histone H3 initiates primarily within pericentromeric heterochromatin during G2 and spreads in an ordered fashion coincident with mitotic chromosome condensation. *Chromosoma* **106**: 348-360
- Hewish DR, Burgoyne LA (1973) Chromatin sub-structure. The digestion of chromatin DNA at regularly spaced sites by a nuclear deoxyribonuclease. *Biochem Biophys Res Commun* **52**: 504-510
- Hirano T (2004) Chromosome shaping by two condensins. *Cell Cycle* **3**: 26-28
- Hirano T (2005) Condensins: organizing and segregating the genome. *Curr Biol* **15**: R265-275

- Hirano T, Kobayashi R, Hirano M (1997) Condensins, chromosome condensation protein complexes containing XCAP-C, XCAP-E and a Xenopus homolog of the Drosophila Barren protein. *Cell* **89**: 511-521
- Hirano T, Mitchison TJ (1993) Topoisomerase II does not play a scaffolding role in the organization of mitotic chromosomes assembled in Xenopus egg extracts. *J Cell Biol* **120**: 601-612
- Hirano T, Mitchison TJ (1994) A heterodimeric coiled-coil protein required for mitotic chromosome condensation in vitro. *Cell* **79**: 449-458
- Hirota T, Gerlich D, Koch B, Ellenberg J, Peters JM (2004) Distinct functions of condensin I and II in mitotic chromosome assembly. *J Cell Sci* **117**: 6435-6445
- Hirsch B, Shimamura A, Moreau L, Baldinger S, Hag-alshiekh M, Bostrom B, Sencer S, D'Andrea AD (2004) Association of biallelic BRCA2/FANCD1 mutations with spontaneous chromosomal instability and solid tumors of childhood. *Blood* **103**: 2554-2559
- Hrimech M, Yao XJ, Branton PE, Cohen EA (2000) Human immunodeficiency virus type 1 Vpr-mediated G(2) cell cycle arrest: Vpr interferes with cell cycle signaling cascades by interacting with the B subunit of serine/threonine protein phosphatase 2A. *Embo J* **19**: 3956-3967
- Hrimech M, Yao XJ, Branton PE, Cohen EA (2002) Retraction of: Human immunodeficiency virus type 1 Vpr-mediated G(2) cell cycle arrest: Vpr interferes with cell cycle signaling cascades by interacting with the B subunit of serine/threonine protein phosphatase 2A. *Embo J* **21**: 3918
- Hsu JY, et al (2000) Mitotic phosphorylation of histone H3 is governed by Ipl1/aurora kinase and Glc7/PP1 phosphatase in budding yeast and nematodes. *Cell* **102**: 279-291
- Hung LY, Chen HL, Chang CW, Li BR, Tang TK (2004) Identification of a novel microtubule-destabilizing motif in CPAP that binds to tubulin heterodimers and inhibits microtubule assembly. *Mol Biol Cell* **15**: 2697-2706
- Huppi K, Martin SE, Caplen NJ (2005) Defining and assaying RNAi in mammalian cells. *Mol Cell* **17**: 1-10
- Huyton T, Bates PA, Zhang X, Sternberg MJ, Freemont PS (2000) The BRCA1 C-terminal domain: structure and function. *Mutat Res* **460**: 319-332
- Ivanov D, Nasmyth K (2005) A Topological Interaction between Cohesin Rings and a Circular Minichromosome. *Cell* **122**: 849-860
- Jackson AP, et al (2002) Identification of microcephalin, a protein implicated in determining the size of the human brain. *Am J Hum Genet* **71**: 136-142
- Jackson AP, et al (1998) Primary autosomal recessive microcephaly (MCPH1) maps to chromosome 8p22-pter. *Am J Hum Genet* **63**: 541-546
- Jamieson CR, Fryns JP, Jacobs J, Matthijs G, Abramowicz MJ (2000) Primary autosomal recessive microcephaly: MCPH5 maps to 1q25-q32. *Am J Hum Genet* **67**: 1575-1577
- Jamieson CR, Govaerts C, Abramowicz MJ (1999) Primary autosomal recessive microcephaly: homozygosity mapping of MCPH4 to chromosome 15. *Am J Hum Genet* **65**: 1465-1469
- Kanda R, Eguchi-Kasai K, Hayata I (1999) Phosphatase inhibitors and premature chromosome condensation in human peripheral lymphocytes at different cell-cycle phases. *Somat Cell Mol Genet* **25**: 1-8
- Kastan MB, Bartek J (2004) Cell-cycle checkpoints and cancer. *Nature* **432**: 316-323
- Kimura K, Hirano M, Kobayashi R, Hirano T (1998) Phosphorylation and activation of 13S condensin by Cdc2 in vitro. *Science* **282**: 487-490
- Kimura K, Hirano T (1997) ATP-dependent positive supercoiling of DNA by 13S condensin: a biochemical implication for chromosome condensation. *Cell* **90**: 625-634

- Kimura K, Rybenkov VV, Crisona NJ, Hirano T, Cozzarelli NR (1999) 13S condensin actively reconfigures DNA by introducing global positive writhe: implications for chromosome condensation. *Cell* **98**: 239-248
- Kinoshita N, Ohkura H, Yanagida M (1990) Distinct, essential roles of type 1 and 2A protein phosphatases in the control of the fission yeast cell division cycle. *Cell* **63**: 405-415
- Kireeva N, Lakonishok M, Kireev I, Hirano T, Belmont AS (2004) Visualization of early chromosome condensation: a hierarchical folding, axial glue model of chromosome structure. *J Cell Biol* **166**: 775-785
- Kornack DR, Rakic P (1998) Changes in cell-cycle kinetics during the development and evolution of primate neocortex. *Proc Natl Acad Sci U S A* **95**: 1242-1246
- Kornberg RD (1974) Chromatin structure: a repeating unit of histones and DNA. *Science* **184**: 868-871
- Kouprina N, et al (2005) The microcephaly ASPM gene is expressed in proliferating tissues and encodes for a mitotic spindle protein. *Hum Mol Genet* **14**: 2155-2165
- Kouprina N, et al (2004) Accelerated evolution of the ASPM gene controlling brain size begins prior to human brain expansion. *PLoS Biol* **2**: E126
- Kozak M (1999) Initiation of translation in prokaryotes and eukaryotes. *Gene* **234**: 187-208
- Krantz ID, et al (2004) Cornelia de Lange syndrome is caused by mutations in NIPBL, the human homolog of Drosophila melanogaster Nipped-B. *Nat Genet* **36**: 631-635
- Kubai DF (1975) The evolution of the mitotic spindle. *Int Rev Cytol* **43**: 167-227
- Laemmli UK, Cheng SM, Adolph KW, Paulson JR, Brown JA, Baumbach WR (1978) Metaphase chromosome structure: the role of nonhistone proteins. *Cold Spring Harb Symp Quant Biol* **42 Pt 1**: 351-360
- Lavoie BD, Hogan E, Koshland D (2002) In vivo dissection of the chromosome condensation machinery: reversibility of condensation distinguishes contributions of condensin and cohesin. *J Cell Biol* **156**: 805-815
- Leal GF, Roberts E, Silva EO, Costa SM, Hampshire DJ, Woods CG (2003) A novel locus for autosomal recessive primary microcephaly (MCPH6) maps to 13q12.2. *J Med Genet* **40**: 540-542
- Leblond CP, El-Alfy M (1998) The eleven stages of the cell cycle, with emphasis on the changes in chromosomes and nucleoli during interphase and mitosis. *Anat Rec* **252**: 426-443
- Lee EY (2002) BRCA1 and Chk1 in G2/M checkpoint: a new order of regulation. *Cell Cycle* **1**: 178-180
- Lee TH, Solomon MJ, Mumby MC, Kirschner MW (1991) INH, a negative regulator of MPF, is a form of protein phosphatase 2A. *Cell* **64**: 415-423
- Lee TH, Turck C, Kirschner MW (1994) Inhibition of cdc2 activation by INH/PP2A. *Mol Biol Cell* **5**: 323-338
- Lemke J, et al (2002) The DNA-based structure of human chromosome 5 in interphase. *Am J Hum Genet* **71**: 1051-1059
- Li L, Zou L (2005) Sensing, signaling, and responding to DNA damage: organization of the checkpoint pathways in mammalian cells. *J Cell Biochem* **94**: 298-306
- Lin SY, Elledge SJ (2003) Multiple tumor suppressor pathways negatively regulate telomerase. *Cell* **113**: 881-889
- Lin SY, Rai R, Li K, Xu ZX, Elledge SJ (2005) BRIT1/MCPH1 is a DNA damage responsive protein that regulates the Brcal-Chk1 pathway, implicating checkpoint dysfunction in microcephaly. *Proc Natl Acad Sci U S A* **102**: 15105-15109
- Lindqvist A, Kallstrom H, Lundgren A, Barsoum E, Rosenthal CK (2005) Cdc25B cooperates with Cdc25A to induce mitosis but has a unique role in activating cyclin B1-Cdk1 at the centrosome. *J Cell Biol* **171**: 35-45
- Livak KJ, Schmittgen TD (2001) Analysis of relative gene expression data using real-time quantitative PCR and the 2(-Delta Delta C(T)) Method. *Methods* **25**: 402-408

- Losada A, Hirano M, Hirano T (1998) Identification of Xenopus SMC protein complexes required for sister chromatid cohesion. *Genes Dev* **12**: 1986-1997
- Losada A, Hirano T (2001) Shaping the metaphase chromosome: coordination of cohesion and condensation. *Bioessays* **23**: 924-935
- Losada A, Hirano T (2005) Dynamic molecular linkers of the genome: the first decade of SMC proteins. *Genes Dev* **19**: 1269-1287
- Losada A, Yokochi T, Hirano T (2005) Functional contribution of Pds5 to cohesin-mediated cohesion in human cells and Xenopus egg extracts. *J Cell Sci* **118**: 2133-2141
- Maeshima K, Laemmli UK (2003) A two-step scaffolding model for mitotic chromosome assembly. *Dev Cell* **4**: 467-480
- Marsden MP, Laemmli UK (1979) Metaphase chromosome structure: evidence for a radial loop model. *Cell* **17**: 849-858
- Matsusaka T, Pines J (2004) Chfr acts with the p38 stress kinases to block entry to mitosis in mammalian cells. *J Cell Biol* **166**: 507-516
- Mazia D. (1961) Mitosis and the physiology of cell division. In Brachet, J and Mirsky, A (eds.), *The Cell*. Academic Press, New York, pp. 77-412.
- McIntosh JR, Koonce MP (1989) Mitosis. *Science* **246**: 622-628
- Meister G, Tuschl T (2004) Mechanisms of gene silencing by double-stranded RNA. *Nature* **431**: 343-349
- Mekel-Bobrov N, Gilbert SL, Evans PD, Vallender EJ, Anderson JR, Hudson RR, Tishkoff SA, Lahn BT (2005) Ongoing adaptive evolution of ASPM, a brain size determinant in Homo sapiens. *Science* **309**: 1720-1722
- Melby TE, Ciampaglio CN, Briscoe G, Erickson HP (1998) The symmetrical structure of structural maintenance of chromosomes (SMC) and MukB proteins: long, antiparallel coiled coils, folded at a flexible hinge. *J Cell Biol* **142**: 1595-1604
- Mochida GH, Walsh CA (2001) Molecular genetics of human microcephaly. *Curr Opin Neurol* **14**: 151-156
- Moynihan L, Jackson AP, Roberts E, Karbani G, Lewis I, Corry P, Turner G, Mueller RF, Lench NJ, Woods CG (2000) A third novel locus for primary autosomal recessive microcephaly maps to chromosome 9q34. *Am J Hum Genet* **66**: 724-727
- Murray AW (1998) How to compact DNA. *Science* **282**: 425, 427
- Murray AW (2004) Recycling the cell cycle: cyclins revisited. *Cell* **116**: 221-234
- Neitzel H (1986) A routine method for the establishment of permanent growing lymphoblastoid cell lines. *Hum Genet* **73**: 320-326
- Neitzel H, Neumann LM, Schindler D, Wirges A, Tonnes H, Trimborn M, Krebssova A, Richter R, Sperling K (2002) Premature chromosome condensation in humans associated with microcephaly and mental retardation: a novel autosomal recessive condition. *Am J Hum Genet* **70**: 1015-1022
- Neuwald AF, Hirano T (2000) HEAT repeats associated with condensins, cohesins, and other complexes involved in chromosome-related functions. *Genome Res* **10**: 1445-1452
- Nicklas RB, Arana P (1992) Evolution and the meaning of metaphase. *J Cell Sci* **102** ( Pt 4): 681-690
- Nigg EA (2001a) Cell cycle regulation by protein kinases and phosphatases. *Ernst Schering Res Found Workshop*: 19-46
- Nigg EA (2001b) Mitotic kinases as regulators of cell division and its checkpoints. *Nat Rev Mol Cell Biol* **2**: 21-32
- Nurse P (1997) Checkpoint pathways come of age. *Cell* **91**: 865-867
- O'Farrell PH (2001) Triggering the all-or-nothing switch into mitosis. *Trends Cell Biol* **11**: 512-519
- Ohi R, Gould KL (1999) Regulating the onset of mitosis. *Curr Opin Cell Biol* **11**: 267-273

- Ono T, Fang Y, Spector DL, Hirano T (2004) Spatial and temporal regulation of Condensins I and II in mitotic chromosome assembly in human cells. *Mol Biol Cell* **15**: 3296-3308
- Ono T, Losada A, Hirano M, Myers MP, Neuwald AF, Hirano T (2003) Differential contributions of condensin I and condensin II to mitotic chromosome architecture in vertebrate cells. *Cell* **115**: 109-121
- Oudet P, Gross-Bellard M, Chambon P (1975) Electron microscopic and biochemical evidence that chromatin structure is a repeating unit. *Cell* **4**: 281-300
- Paterson MC, Smith PJ (1979) Ataxia telangiectasia: an inherited human disorder involving hypersensitivity to ionizing radiation and related DNA-damaging chemicals. *Annu Rev Genet* **13**: 291-318
- Pattison L, Crow YJ, Deeble VJ, Jackson AP, Jafri H, Rashid Y, Roberts E, Woods CG (2000) A fifth locus for primary autosomal recessive microcephaly maps to chromosome 1q31. *Am J Hum Genet* **67**: 1578-1580
- Paulson JR, Laemmli UK (1977) The structure of histone-depleted metaphase chromosomes. *Cell* **12**: 817-828
- Pederson T (1972) Chromatin structure and the cell cycle. *Proc Natl Acad Sci U S A* **69**: 2224-2228
- Pederson T, Robbins E (1972) Chromatin structure and the cell division cycle. Actinomycin binding in synchronized HeLa cells. *J Cell Biol* **55**: 322-327
- Pines J (1999) Four-dimensional control of the cell cycle. *Nat Cell Biol* **1**: E73-79
- Pines J, Rieder CL (2001) Re-staging mitosis: a contemporary view of mitotic progression. *Nat Cell Biol* **3**: E3-6
- Poirier M, Eroglu S, Chatenay D, Marko JF (2000) Reversible and irreversible unfolding of mitotic newt chromosomes by applied force. *Mol Biol Cell* **11**: 269-276
- Poirier M, Marko JF (2002) Mitotic chromosomes are chromatin networks without a mechanically contiguous protein scaffold. *Proc Natl Acad Sci U S A* **99**: 15393-15397
- Ponting C, Jackson AP (2005) Evolution of primary microcephaly genes and the enlargement of primate brains. *Curr Opin Genet Dev* **15**: 241-248
- Prigent C, Dimitrov S (2003) Phosphorylation of serine 10 in histone H3, what for? *J Cell Sci* **116**: 3677-3685
- Rakic P (1995) A small step for the cell, a giant leap for mankind: a hypothesis of neocortical expansion during evolution. *Trends Neurosci* **18**: 383-388
- Rieder CL, Cole RW (1998) Entry into mitosis in vertebrate somatic cells is guarded by a chromosome damage checkpoint that reverses the cell cycle when triggered during early but not late prophase. *J Cell Biol* **142**: 1013-1022
- Rieder CL, Palazzo RE (1992) Colcemid and the mitotic cycle. *J Cell Sci* **102** ( Pt 3): 387-392
- Ripoll P, Pimpinelli S, Valdivia MM, Avila J (1985) A cell division mutant of Drosophila with a functionally abnormal spindle. *Cell* **41**: 907-912
- Ris H, Kubai DF (1974) An unusual mitotic mechanism in the parasitic protozoan *Syndinium* sp. *J Cell Biol* **60**: 702-720
- Roberts E, et al (1999) The second locus for autosomal recessive primary microcephaly (MCPH2) maps to chromosome 19q13.1-13.2. *Eur J Hum Genet* **7**: 815-820
- Saitoh N, Goldberg I, Earnshaw WC (1995) The SMC proteins and the coming of age of the chromosome scaffold hypothesis. *Bioessays* **17**: 759-766
- Saitoh Y, Laemmli UK (1994) Metaphase chromosome structure: bands arise from a differential folding path of the highly AT-rich scaffold. *Cell* **76**: 609-622
- Sancar A, Lindsey-Boltz LA, Unsal-Kacmaz K, Linn S (2004) Molecular mechanisms of mammalian DNA repair and the DNA damage checkpoints. *Annu Rev Biochem* **73**: 39-85
- Sanchez I, Dynlacht BD (2005) New insights into cyclins, CDKs, and cell cycle control. *Semin Cell Dev Biol* **16**: 311-321

- Sanger F, Nicklen S, Coulson AR (1977) DNA sequencing with chain-terminating inhibitors. *Proc Natl Acad Sci U S A* **74:** 5463-5467
- Schleiffer A, Kaitna S, Maurer-Stroh S, Glotzer M, Nasmyth K, Eisenhaber F (2003) Kleisins: a superfamily of bacterial and eukaryotic SMC protein partners. *Mol Cell* **11:** 571-575
- Schmiesing JA, Gregson HC, Zhou S, Yokomori K (2000) A human condensin complex containing hCAP-C-hCAP-E and CNAP1, a homolog of Xenopus XCAP-D2, colocalizes with phosphorylated histone H3 during the early stage of mitotic chromosome condensation. *Mol Cell Biol* **20:** 6996-7006
- Shackelford RE, Kaufmann WK, Paules RS (1999) Cell cycle control, checkpoint mechanisms, and genotoxic stress. *Environ Health Perspect* **107 Suppl 1:** 5-24
- Shi LJ, Ni ZM, Zhao S, Wang G, Yang Y (1987) Involvement of a nucleolar component, perichromonucleolin, in the condensation and decondensation of chromosomes. *Proc Natl Acad Sci U S A* **84:** 7953-7956
- Shi Q, Adler ID, Zhang J, Zhang X, Shan X, Martin R (2000) Incidence of mosaic cell lines in vivo and malsegregation of chromosome 21 in lymphocytes in vitro of trisomy 21 patients: detection by fluorescence in situ hybridization on binucleated lymphocytes. *Hum Genet* **106:** 29-35
- Shirayama M, Toth A, Galova M, Nasmyth K (1999) APC(Cdc20) promotes exit from mitosis by destroying the anaphase inhibitor Pds1 and cyclin Clb5. *Nature* **402:** 203-207
- Sperling K, Rao PN (1974) The phenomenon of premature chromosome condensation: its relevance to basic and applied research. *Humangenetik* **23:** 235-258
- Steen RL, Cubizolles F, Le Guellec K, Collas P (2000) A kinase-anchoring protein (AKAP)95 recruits human chromosome-associated protein (hCAP)-D2/Eg7 for chromosome condensation in mitotic extract. *J Cell Biol* **149:** 531-536
- Stelzl U, et al (2005) A human protein-protein interaction network: a resource for annotating the proteome. *Cell* **122:** 957-968
- Strom L, Lindroos HB, Shirahige K, Sjogren C (2004) Postreplicative recruitment of cohesin to double-strand breaks is required for DNA repair. *Mol Cell* **16:** 1003-1015
- Stuurman N, Heins S, Aebi U (1998) Nuclear lamins: their structure, assembly, and interactions. *J Struct Biol* **122:** 42-66
- Sumara I, Vorlaufer E, Stukenberg PT, Kelm O, Redemann N, Nigg EA, Peters JM (2002) The dissociation of cohesin from chromosomes in prophase is regulated by Polo-like kinase. *Mol Cell* **9:** 515-525
- Swedlow JR, Hirano T (2003) The making of the mitotic chromosome: modern insights into classical questions. *Mol Cell* **11:** 557-569
- Swedlow JR, Sedat JW, Agard DA (1993) Multiple chromosomal populations of topoisomerase II detected in vivo by time-lapse, three-dimensional wide-field microscopy. *Cell* **73:** 97-108
- Taalman RD, Jaspers NG, Scheres JM, de Wit J, Hustinx TW (1983) Hypersensitivity to ionizing radiation, in vitro, in a new chromosomal breakage disorder, the Nijmegen Breakage Syndrome. *Mutat Res* **112:** 23-32
- Takizawa CG, Morgan DO (2000) Control of mitosis by changes in the subcellular location of cyclin-B1-Cdk1 and Cdc25C. *Curr Opin Cell Biol* **12:** 658-665
- Taylor SS, Scott MI, Holland AJ (2004) The spindle checkpoint: a quality control mechanism which ensures accurate chromosome segregation. *Chromosome Res* **12:** 599-616
- Tonkin ET, Wang TJ, Lisgo S, Bamshad MJ, Strachan T (2004) NIPBL, encoding a homolog of fungal Scc2-type sister chromatid cohesion proteins and fly Nipped-B, is mutated in Cornelia de Lange syndrome. *Nat Genet* **36:** 636-641
- Trimborn M, et al (2004) Mutations in microcephalin cause aberrant regulation of chromosome condensation. *Am J Hum Genet* **75:** 261-266

- Trimborn M, Richter R, Sternberg N, Gavvovidis I, Schindler D, Jackson AP, Prrott EC, Sperling K, Gillessen-Kaesbach G, Neitzel H (2005) The first missense alteration in the MCPH1 gene causes autosomal recessive microcephaly with an extremely mild cellular and clinical phenotype. *Hum Mutat* **26**: 496-497
- Trimborn M, Schindler D, Neitzel H, Hirano T (2006) Misregulated chromosome condensation in MCPH1 primary microcephaly is mediated by condensin II. *Cell Cycle* **5**: 322-326
- Trujillo KM, Yuan SS, Lee EY, Sung P (1998) Nuclease activities in a complex of human recombination and DNA repair factors Rad50, Mre11, and p95. *J Biol Chem* **273**: 21447-21450
- Uchida S, Sekiguchi T, Nishitani H, Miyauchi K, Ohtsubo M, Nishimoto T (1990) Premature chromosome condensation is induced by a point mutation in the hamster RCC1 gene. *Mol Cell Biol* **10**: 577-584
- Uemura T, Yanagida M (1984) Isolation of type I and II DNA topoisomerase mutants from fission yeast: single and double mutants show different phenotypes in cell growth and chromatin organization. *Embo J* **3**: 1737-1744
- Uhlmann F, Lottspeich F, Nasmyth K (1999) Sister-chromatid separation at anaphase onset is promoted by cleavage of the cohesin subunit Scc1. *Nature* **400**: 37-42
- Ullu E, Tschudi C, Chakraborty T (2004) RNA interference in protozoan parasites. *Cell Microbiol* **6**: 509-519
- Unal E, Arbel-Eden A, Sattler U, Shroff R, Lichten M, Haber JE, Koshland D (2004) DNA damage response pathway uses histone modification to assemble a double-strand break-specific cohesin domain. *Mol Cell* **16**: 991-1002
- Vagnarelli P, Earnshaw WC (2004) Chromosomal passengers: the four-dimensional regulation of mitotic events. *Chromosoma* **113**: 211-222
- Vagnarelli PB, Earnshaw WC (2001) INCENP loss from an inactive centromere correlates with the loss of sister chromatid cohesion. *Chromosoma* **110**: 393-401
- Van Hooser A, Goodrich DW, Allis CD, Brinkley BR, Mancini MA (1998) Histone H3 phosphorylation is required for the initiation, but not maintenance, of mammalian chromosome condensation. *J Cell Sci* **111 ( Pt 23)**: 3497-3506
- Waizenegger IC, Hauf S, Meinke A, Peters JM (2000) Two distinct pathways remove mammalian cohesin from chromosome arms in prophase and from centromeres in anaphase. *Cell* **103**: 399-410
- Wallerman O, Van Eeghen A, Ten Kate LP, Wadelius C (2003) Evidence for a second gene for primary microcephaly at MCPH5 on chromosome 1. *Hereditas* **139**: 64-67
- Wang JC (2002) Cellular roles of DNA topoisomerases: a molecular perspective. *Nat Rev Mol Cell Biol* **3**: 430-440
- Wang YQ, Su B (2004) Molecular evolution of microcephalin, a gene determining human brain size. *Hum Mol Genet* **13**: 1131-1137
- Wanker EE, Rovira C, Scherzinger E, Hasenbank R, Walter S, Tait D, Colicelli J, Lehrach H (1997) HIP-1: a huntingtin interacting protein isolated by the yeast two-hybrid system. *Hum Mol Genet* **6**: 487-495
- Waterhouse PM, Wang MB, Lough T (2001) Gene silencing as an adaptive defence against viruses. *Nature* **411**: 834-842
- Wei Y, Yu L, Bowen J, Gorovsky MA, Allis CD (1999) Phosphorylation of histone H3 is required for proper chromosome condensation and segregation. *Cell* **97**: 99-109
- Woods CG (2004) Human microcephaly. *Curr Opin Neurobiol* **14**: 112-117
- Woods CG, Bond J, Enard W (2005) Autosomal recessive primary microcephaly (MCPH): a review of clinical, molecular, and evolutionary findings. *Am J Hum Genet* **76**: 717-728
- Xu X, Lee J, Stern DF (2004) Microcephalin is a DNA damage response protein involved in regulation of CHK1 and BRCA1. *J Biol Chem* **279**: 34091-34094

- Yoshimura SH, Hizume K, Murakami A, Sutani T, Takeyasu K, Yanagida M (2002) Condensin architecture and interaction with DNA: regulatory non-SMC subunits bind to the head of SMC heterodimer. *Curr Biol* **12**: 508-513
- Zhang J (2003) Evolution of the human ASPM gene, a major determinant of brain size. *Genetics* **165**: 2063-2070
- Zheng Y, Jung MK, Oakley BR (1991) Gamma-tubulin is present in Drosophila melanogaster and Homo sapiens and is associated with the centrosome. *Cell* **65**: 817-823
- Zhong X, Liu L, Zhao A, Pfeifer GP, Xu X (2005) The abnormal spindle-like, microcephaly-associated (ASPM) gene encodes a centrosomal protein. *Cell Cycle* **4**: 1227-1229
- Zijno A, Marcon F, Leopardi P, Crebelli R (1994) Simultaneous detection of X-chromosome loss and non-disjunction in cytokinesis-blocked human lymphocytes by in situ hybridization with a centromeric DNA probe; implications for the human lymphocyte in vitro micronucleus assay using cytochalasin B. *Mutagenesis* **9**: 225-232