

- Akey C.W.(1990) Visualization of transport-related configurations of the nuclear pore transporter. *Biophys. J.* **57**, 341-375.
- Akey C.W., Luger K. (2003) Histone chaperones and nucleosome assembly. *Curr. Opin. Struct. Biol.* **13**, 6-14.
- Alberts B., Bray D., Lewis J., Raff M., Roberts K., Watson J.D. (1994) Biología molecular de la célula. Ed. Omega. Fundació Barcelona.
- Allan J., Harborne N., Rau D.C., Gould H. (1982) Participation of core histone "tails" in the stabilization of the chromatin solenoid. *J. Cell Biol.* **93**, 285-297.
- Allan J., Mitchell T., Harborne N., Bohm L., Crane-Robinson C. (1986) Roles of H1 domains determining higher order chromatin structure and H1 location. *J. Mol. Biol.* **187**, 591-601.
- Allen G. (1989) Laboratory techniques in biochemistry and molecular biology. Burdon R.H., van Knippenberg P.H. Ed. Elsevier, Amsterdam. Vol. 9.
- Almouzni G., Clark D.J., Méchali M., Wolffe A.P. (1990) Chromatin assembly on replicating DNA *in vitro*. *Nucl. Acids Res.* **18**, 5767-5774.
- Andrade R., Arlucea J., Alonso R., Archeaga J. (2001) Nucleoplasmin binds to nuclear pore filaments and accumulates in specific regions of the nucleolar cortex. *Chromosome* **109**, 545-550.
- Andrade M.A., Chacón P., Merolo J.J., Morán F. (1993) Evaluation of secondary structure of protein from UV circular dichroism spectra using unsupervised learning neural network. *Protein Eng.* **6**, 383- 390.
- Anfinsen C.B. (1973) Principles that govern the folding of protein chains. *Science* **181**, 223-230.
- Arents G., Burlingame R.W., Wang B.C., Love W.E., Moudrianakis E.N. (1991) The nucleosomal core octamer at 3.1 Å resolution: A tripartite protein assembly and a left-handed superhelix. *Proc. Natl. Acad. Sci. USA* **88**, 10148-10152.
- Ariyoshi N., Hiyoshi H., Katagiri C., Abe S.I. (1994) cDNA cloning and expression of *Xenopus* sperm-specific basic nuclear protein 5 (SP5) gene. *Mol. Reprod. Dev.* **37**, 363-369.
- Ausió J. (2000) Analytical ultracentrifugation and the characterization of chromatin structure. *Biophys. Chem.* **86**, 141-153.
- Ausió J., Dong F., van Holde K.E. (1989) Use of selectively trypsinated nucleosome core particles to analyze the role of the histone "tails" in the stabilization of the nucleosome. *J. Mol. Biol.* **206**, 451-463.
- Ausió J., Malenick D.A., Anderson S.R. (1992) Analytical sedimentation studies of turkey gizzard myosin light chain kinase and telokin. *Biophys. J.* **61**, 1656-1663.
- Ausió J., Moore S.C. (1998) Reconstitution of chromatin complexes from high-performance liquid chromatography-purified histones. *Methods: a companion to methods in enzymology* **15**, 333-342.
- Ausió J., Subirana J.A. (1982) A high molecular weight nuclear basic protein from the bivalve mollusc *Spisula solidissima*. *J. Biol. Chem.* **25**, 2802-2805.
- Azorín F., Olivares C., Jordán A., Pérez-Grau L., Cornudella L., Subirana J.A. (1983) Heterogeneity of the histone-containing chromatin in sea cucumber spermatozoa. Distribution of the basic protein ϕ_0 and absence of non-histone proteins. *Exp. Cell Res.* **148**, 331-344.

- Azorín F., Pérez-Grau L., Subirana J.A. (1982) Supranucleosomal organization of chromatin. *Chromosoma* **85**, 251-260.
- Babu A., Verma R.S. (1987) Chromosome structure: Euchromatin and heterochromatin. *Int. Rev. Cytobio.* **108**, 1-60.
- Badenhorst P., Voas M., Rebay I., Wu C. (2002) Biological functions of the ISWI chromatin remodeling complex NURF. *Genes Dev.* **16**, 3186-3198.
- Balhorn R. (1982) Mammalian protamines: Structure and molecular interactions. Kenneth W. Adolph Ed. A: Molecular biology of chromosome function. Springer-Verlag.
- Balhorn R., Corzett M., Mazrimas J., Watkins B. (1991) Identification of bull protamine disulphides. *Biochemistry* **30**, 366-420.
- Bar-Joseph M., Malkinson M. (1980) Hen egg yolk as a source of antiviral antibodies in the enzyme linked immunosorbent assay (ELISA): a comparison of two plant viruses. *Journ. Virol. Met.* **1**, 179-183.
- Barros C. (1987) Sperm chromatin decondensation after fertilization. *Micrsc. elect. y biol. mol.* **11**, 15-25.
- Barry J.M., Merriam R.W. (1972) Swelling of hen erythrocyte nuclei in cytoplasm from *Xenopus* eggs. *Exp. Cell Res.* **71**, 90-96.
- Bernardi, G. (1971) Methods in Enzymology. Jakoby, W.B. Ed. Academic Press, New York. Vol. 22, 325-
- Berrios M., Avilion A.A. (1990) Nuclear formation in a *Drosophila* cell-free system. *Expt. Cell Res.* **191**, 64-70.
- Birnboim H.C., Doly J. (1979) A rapid alkaline lysis procedure for screening recombinant plasmid DNA. *Nucl. Acids. Res.* **7**, 1513-1522.
- Bonne-Andrea C., Harper F., Sobczak J., De Recondo A. (1984) Rat liver HMG1: a physiological nucleosome assembly factor. *The EMBO Jour.* **3**, 1193-1199.
- Bonner W.M. (1975) Protein migration into nuclei. I. Frog oocyte nuclei *in vivo* accumulate microinjected histones, allow entry to small proteins, and exclude large proteins. *J. Cell Biol.* **64**, 421-430.
- Borer A.A., Lehner C.F., Eppenberger H.M., Nigg E.A. (1989) Major nucleolar proteins shuttle between nucleus and cytoplasm. *Cell* **56**, 379-390.
- Bradford M.M. (1976) A rapid and sensitive method for the quantitation of microgram quantities of protein utilizing the principle of protein-dye binding. *Anal. Biochem.* **72**, 248-254.
- Brown D.B., Blake E.J., Wolgemuth D.J., Gordon K., Ruddle F.H. (1987) Chromatin decondensation and DNA synthesis in human sperm activated *in vitro* by using *Xenopus laevis* egg extracts. *J. Exp. Zool.* **242**, 215-231.
- Brown D.B., Miskimins W.K., Ruddle F.H. (1991) Partial purification of *Xenopus laevis* egg extract factor(s) that induce swelling in permeabilized human sperm. *Journ. Expt. Zoolog.* **258**, 263-272.
- Buck M. (1998) Trifluoroethanol and colleagues: cosolvents come of age. Recent studies with peptides and proteins. *Quar. Rev. Biop.* **31**, 297-355.

- Bundi A., Wüthrich K. (1979) 1H-NMR parameters of the common amino acid residues measured in aqueous solutions of the linear tetrapeptides H-Gly-Gly-X-L-Ala-OH. *Biopolymers* **18**, 285-297.
- Bürglin T.R., De Robertis E.M. (1987) The nuclear migration signal of *Xenopus laevis* nucleoplasmin. *The EMBO Jour.* **6**, 2617-2625.
- Bürglin T.R., Mataj I.W., Newmeyer D.D., Zeller R., De Robertis E.M. (1987) Cloning of nucleoplasmin from *Xenopus* oocytes and analysis of its developmental expression. *Genes and Dev.* **1**, 97-10.
- Cameron C.P., Poccia D.L. (1994) *In vitro* development of the sea urchin male pronucleus. *Dev. Biol.* **162**, 568-578.
- Carruthers L.M., Hansen J.C. (2000) The core histone N-termini function independently of linker histones during chromatin condensation. *J. Biol. Chem.* **275**, 37825-37290.
- Carstens C.P., Waesche A. (1999) Codon bias-adjusted BL21 derivatives for protein expression. *Strategies* **12**, 49-51.
- Casas M.T., Mura C.V., Subirana J.A., Cornudella L. (1989) Purification and immunocyto-localization of protein ϕ_0 from sperm cells of the echinoderm *Holothuria tubulosa*. *Expt. Cell Reser.* **182**, 14-25.
- Chan W.Y., Liu Q.R., Borjigin J., Busch H., Rennert O.M., Tease L.A., Chan P.K. (1989) Characterization of the cDNA encoding human nucleophosmin and studies of its role in normal and abnormal growth. *Biochemistry* **28**, 1033-1039.
- Chandrasekhar G.N., Tilly K., Woolford C., Hendrix R.W., Georgopoulos C. (1986) Purification and properties of the GroES morphogenetic protein of *Escherichia coli*. *J. Biol. Chem.* **261**, 12414-12419.
- Chang L., Loranger S.S., Mizzen C., Ernst S.G., Allis C.D., Annunziato A.T. (1997) Histones in transit: cytosolic histone complexes and diacetylation of H4 during nucleosome assembly in human cells. *Biochemistry* **36**, 469-480.
- Chen H., Baiyong L., Workman J.L. (1994) A histone-binding protein, nucleoplasmin, stimulates transcription factor binding to nucleosomes and factor-induced nucleosome assembly. *The EMBO Jour.* **13**, 380-390.
- Chiva M., Subirana J.A. (1986) Estudi dels patrons de difracció de raigs X dels complexes del DNA amb dues protamines d'aus. III Jornades Biologia Molecular, Soc. Cat. Biol.
- Chou P.Y., Fasman G.D. (1978) Empirical predictions of protein conformation. *Annu. Rev. Biochem.* **47**, 251-276.
- Clark D.J., Felsenfeld G. (1992) A nucleosome core is transferred out of the path of a transcribing polymerase. *Cell* **71**, 11-22.
- Cleland W.W. (1964) Dithiothreitol, a new protective reagent for SH groups. *Biochemistry* **3**, 480-482.
- Cohen S.N., Chang A.C.Y., Hsu L. (1972) Nonchromosomal antibiotic resistance in bacteria: genetic transformation of *Escherichia coli* by R-factor DNA. *Proc. Natl. Acad. Sci. USA* **69**, 2110-2114.
- Cohn E.J., Edsall J.T. (1943) Proteins, amino acids, and peptides as ions and dipolar ions. Reinhold Publ.Co. New York. pp. 374-377.
- Collas P., Poccia D. (1998) Remodelling the sperm nucleus into a male pronucleus at fertilization. *Theriogenology* **49**, 67-81.

- Conti E., Kuriyan J. (2000) Crystallographic analysis of the specific yet versatile recognition of distinct nuclear localization signals by karyopherin alpha. *Struct. Fold Des.* **3**, 329-338.
- Cornudella L., Rocha E. (1979) Nucleosome organization during germ cell development in the sea cucumber *Holothuria tubulosa*. *Biochemistry*. **18**, 3724-3732.
- Cotten M., Chalkley R. (1987) Purification of a novel, nucleoplasmin-like protein from somatic nuclei. *The EMBO Jour.* **6**, 3945-3954.
- Cotten M., Sealy L., Chalkley R. (1986) Massive phosphorylation distinguishes *Xenopus laevis* nucleoplasmin isolated from oocytes or unfertilized eggs. *Biochemistry* **25**, 5063-5069.
- Cramer P., Bushnell D.A., Fu J., Gnatt A.L., Maier-Davis B., Thompson N.E., Burgess R.R., Edwards A.M., David P.R., Kornberg R.D. (2000) Architecture of RNA polymerase II and implications for the transcription mechanism. *Science* **288**, 640-649.
- Crevel G., Huikeshoven H., Cotterill S. (1997) Molecular and cellular characterization of CRP1, a *Drosophila* chromatin decondensation protein. *Jour. Stru. Biol.* **118**, 9-22.
- De Robertis E.M., Longthorne R., Gurdon J.B. (1978) Intracellular migration of nuclear proteins in *Xenopus* oocytes. *Nature* **272**, 254-256.
- del Valle L. (1999) Tesi doctoral: "Carencia de nucleoplasmina en los ovocitos de *Holothuria tubulosa*. Otra posible actividad que remodela la cromatina del espermatozoide." Universitat Politècnica de Catalunya.
- del Valle L., Zamora M.J., Arnan C., Prieto C., Ausió J., Saperas N., Chiva M. (2003) Sperm chromatin decondensing activity from activated oocytes of the echinoderm *Holothuria tubulosa*. *Mol. Reprod. Dev.* (accepted).
- Dergunova N.N., Bulycheva T.I., Artemenko E.G., Shpakova A.P., Pegova A.N., Gemjian E.G., Dudnik O.A., Zatsepina O.V., Malashenko O.S. (2002) A major nucleolar protein B23 as a marker of proliferation activity of human peripheral lymphocytes. *Immun. Lett.* **83**, 67-72.
- Dilworth S.M., Black S.J., Laskey R.A. (1987) Two complexes that contain histones are required for nucleosome assembly *in vitro*: role of nucleoplasmin and N1 in *Xenopus* egg extracts. *Cell* **51**, 1009-1018.
- Dilworth S.M., Dingwall C. (1988) Chromatin assembly *in vitro* and *in vivo*. *BioEssays* **9**, 44-49.
- Dimitrov S., Dasso M.C., Wolffe A.P. (1994) Remodeling sperm chromatin in *Xenopus laevis* egg extracts: the role of core histone phosphorylation and linker histone B4 in chromatin assembly. *Journ. Cell Biol.* **126**, 591-601.
- Dimitrov S., Wolffe A.P. (1995) Chromatin and nuclear assembly, experimental approaches towards the reconstitution of transcriptionally active and silent states. *Biochim. Biophys. Acta* **1260**, 1-13.
- Dimitrov S., Wolffe A.P. (1996) Remodeling somatic nuclei in *Xenopus laevis* egg extracts: molecular mechanisms for the selective release of histones H1 and H1° from chromatin and the acquisition of transcriptional competence. *The EMBO Jour.* **15**, 5897-5906.
- Dingwall C., Allan J. (1984) Accumulation of the isolated carboxy-terminal domain of histone H1 in the *Xenopus* oocyte nucleus. *The EMBO Jour.* **3**, 1933-1937.

- Dingwall C., Dilworth S.M., Black S.J., Kearsey S.E., Cox L.S., Laskey R.A. (1987) Nucleoplasmin cDNA sequence reveals polyglutamic acid tracts and a cluster of sequences homologous to putative nuclear localization signals. *The EMBO Jour.* **6**, 69-74.
- Dingwall C., Laskey R.A. (1990) Nucleoplasmin the archetypal molecular chaperone. *Semin. Cell Biol.* **1**, 11-17.
- Dingwall C., Laskey R.A. (1991) Nuclear targeting sequences-a consensus? *TIBS* **16**, 478-481.
- Dingwall C., Sharnick S.V., Laskey R.A. (1982) A polypeptide domain that specifies migration of nucleoplasmin into the nucleus. *Cell* **30**, 449-458.
- Dubendorff J.W., Studier F.W. (1991) Controlling basal expression in an inducible T7 expression system by blocking the target T7 promoter with lac repressor. *J. Mole. Biol.* **219**, 45-59.
- Ducruix A., Giegé R. (1992) Crystallization of nucleic acids and proteins. A practical approach. The Practical Approach Series. Rickwood D., Hames B.D. Ed. IRL Press at Oxford University Press.
- Dutta S. (2000) Tesi doctoral: "The X-ray crystallographic structure of nucleoplasmin core: a chaperone for histone octamer assembly." Boston University School of Medicine.
- Dutta S., Akey I.V., Dingwall C., Hartman K.L., Laue T., Nolte R.T., Head J.F., Akey C.W. (2001) The crystal structure of nucleoplasmin-core: Implications for histone binding and nucleosome assembly. *Molecular Cell* **8**, 841-853.
- Earnshaw W.C., Honda B.M., Laskey R.A., Thomas J.O. (1980) Assembly of nucleosomes: the reaction involving *X. laevis* nucleoplasmin. *Cell* **21**, 373-383.
- Edelboch H. (1967) Spectroscopic determination of tryptophan and tyrosine in proteins. *Biochemistry* **6**, 1948-1954.
- Edwards A.M., Darst S.A., Hemming S.A., Li Y., Kornberg R.D. (1994) Epitaxial growth of protein crystals on lipid layers. *Structural biology* **1**, 195-197.
- Eickbush T.H., Moudrianakis E.N. (1978) The histone core complex: an octamer assembled by two sets of protein-protein interactions. *Biochemistry* **17**, 4955-4964.
- Ellis R.J., Hemmingsen S.M. (1989) Molecular chaperones: proteins essential for the biogenesis of some macromolecular structures. *TIBS* **14**, 339-342.
- Ellis R.J., van der Vies S.M. (1991) Molecular chaperones. *Annu. Rev. Biochem.* **60**, 321-347.
- Ellis R.J., van der Vies S.M., Hemmingsen S.M. (1989) The molecular chaperone concept. *Biochem. Soc. Symp.* **55**, 145-153.
- Ellman G.L. (1959) Tissue sulphhydryl groups. *Arch. Biochem. Biophys.* **82**, 70-77.
- Engvall E., Perlmann P. (1971) Enzyme-linked immunosorbent assay (ELISA) quantitative assay of immunoglobulin G. *Immunochemistry* **8**, 871-879.
- Feldherr C.M., Kallenbach E., Schultz N. (1984) Movement of a karyophilic protein through the nuclear pores of oocytes. *J. Cell Biol.* **9**, 2216-2222.
- Finch J.T., Klug A. (1976) Solenoid model for superstructure of chromatin. *Proc. Natl. Acad. Sci. USA* **73**, 1897-1901.

- Fita I., Campos J.L., Puigjaner L.C., Subirana J.A. (1983) X-ray diffraction study of DNA complexes with arginine peptides and their relation to nucleoprotamine structure. *J. Mole. Biol.* **167**, 157-177.

Fontes M.R., Teh T., Kobe B. (2000) Structural basis of recognition of monopartite and bipartite nuclear localization sequences by mammalian importin-alpha. *J. Mole. Biol.* **29**, 1183-1194.

Freund J. (1956) The mode of action of immunologic adjuvants. *Adv. Tuberc. Res.* **7**, 130-148.

Fuji-Nakata T., Ishimi Y., Okuda A., Kikuchi A. (1992) Functional analysis of nucleosome assembly protein, NAP-1. *Journ. Biol. Chem.* **267**, 20980-20986.

Fyodorov D.V., Kadonaga J.T. (2002) Dynamics of ATP-dependent chromatin assembly by ACF. *Nature* **418**, 897-900.

Gaberc-Porekar V., Menart V. (2001) Perspectives of immobilized-metal affinity chromatography. *J. Biochem. Biophys. Met.* **49**, 335-360.

Germond J.E., Hirt B., Oudet P., Gross-Bellard J., Chambon P. (1975) Folding of the DNA double helix in chromatin-like structures from simian virus 40. *Proc. Natl. Acad. Sci. USA* **72**, 1843-1847.

Gill S.C., von Hippel P.H. Calculation of protein extinction coefficients from amino acid sequence data. (1989) *Anal. Biochem.* **182**, 319-326.

Glikin G.C., Ruberti I., Worcel A. (1984) Chromatin assembly in *Xenopus* oocytes: *In vitro* studies. *Cell.* **37**, 33-41.

Gonzaga L. (1997) Tesi doctoral: "Cristalización y estudios estructurales de oligonucleótidos: el octámero d(CpCpCpGpCpGpGpG)₂ y el dodecámero d(CpGpCpCpCpGpCpGpGpCpGpGpCpGp)₂". Universitat Politècnica de Catalunya.

Green G.R., Collas P., Burrell A., Poccia D. (1995) Histone phosphorylation during sea urchin development. *Seminars in Cell Biol.* **6**, 219-227.

Green G.R., Poccia D.L. (1988) Interaction of sperm histone variants and linker DNA during spermiogenesis in the sea urchin. *Biochemistry* **27**, 619-625.

Greenfield N.J. (1996) Methods to estimate the conformation of proteins and polypeptides from circular dichroism data. *Anal. Bioch.* **235**, 1-10.

Grodberg J., Dunn J.J. (1988) OmpT encodes the *Escherichia coli* outer membrane protease that cleaves T7 RNA polymerase during purification. *J.Bacteriol.* **170**, 1245-1253.

Gusse M., Sautiere P., Chauviere M., Chevaillier P. (1983) Extraction, purification and characterization of the sperm protamines of the dog-fish *Scylliorhinus caniculus*. *Bioch. et Biop. Acta* **748**, 93-98.

Hames B.D. (1981) Gel electrophoresis of proteins: a practical approach. Hames B.D., Rickwood D. Eds. IRL Press. Oxford & Washington D.C. pp71-77.

Hansen J.C., Kreider J.I., Demeler B. (1997) Analytical ultracentrifugation and agarose gel electrophoresis as tools for studying chromatin folding in solution. *Methods: A companion to Methods in Enzymology* **12**, 62-72.

Hansen J.C., Tse C., Wolffe A.P. (1998) Structure and function of the core histone N-termini: more than meets the eye. Structure and function of the core histone N-termini: more than meets the eye. *Biochemistry* **37**, 17637-17641.

- Harlow E., Lane D. (1988) Antibodies. A laboratory manual. Cold Spring Harbor, New York.
- Harris E.L.V. (1989) Protein purification methods: a practical approach. Harris E.L.V., Angal S. Ed. Oxford University Press. New York.
- Harris J.R. (1997) Negative staining and cryoelectron microscopy. First ed. RMS Microscopy Handbook Series, 35, BIOS Scientific Oxford.
- Harris J.R. (1999) Negative staining of thinly spread biological particulates. Methods in Molecular Biology. Vol. 117: Electron microscopy methods and protocols. Hajibagheri N. Ed. Humana Press Inc.
- Harris J.R., Horne R.W. (1994) Negative staining: a brief assessment of current technical benefits, limitations and future possibilities. *Micron* **25**, 5-13.
- Hartree E.F. (1972) Determination of protein: a modification of the Lowry method that gives a linear photometric response. *Anal. Biochem.* **48**, 422-427
- Hassl A., Aspöck H. (1988) Purification of egg yolk immunoglobulins. A two-step procedure using hydrophobic interaction chromatography and gel filtration. *Journ. of Immuno. Meth.* **110**, 225-228.
- Herlands L., Maul G.G. (1994) Characterization of a major nucleoplasmin-like germinal vesicle protein which is rapidly phosphorylated before germinal vesicle breakdown in *Spisula solidissima*. *Dev. Biol.* **161**, 530-537.
- Hierro A. (2002) Tesi doctoral: "Efecto de la fosforilación sobre la estructura y función de la nucleoplasmina." Universidad del País Vasco.
- Hierro A., Arizmendi J.M., Bañuelos S., Prado A., Muga A. (2002) Electrostatic interactions at the C-terminal domain of nucleoplasmin modulates its chromatin decondensation activity. *Biochemistry* **41**, 6408-6413.
- Hierro A., Arizmendi J.M., de Las Rivas J., Urbaneja M.A., Prado A., Muga A. (2001) Structural and functional properties of *Escherichia coli*-derived nucleoplasmin. A comparative study of recombinant and natural proteins. *Eur. Jour. Bioch.* **268**, 1739-1748.
- Hiyoshi H., Uno S., Yokota T., Katagiri C., Nishida H., Takai M., Agata K., Eguchi G., Abe S.I. (1991) Isolation of cDNA for a *Xenopus* sperm-specific basic nuclear protein (SP4) and evidence for expression of SP4 mRNA in primary spermatocytes. *Exp. Cell Res.* **194**, 95-99.
- Hochuli E. (1989) Genetically designed affinity chromatography using a novel metal chelate absorbent. *Biologically Active Molecules*. 217-239.
- Holzinger A., Phillips K.S., Weaver T.E. (1996) Single-step purification/solubilization of recombinant proteins: application to surfactant protein B. *BioTechniques*. **20**, 804-808.
- Horne R.W. i Pasquali-Ronchetti I.P. (1974) A negative staining-carbon film technique for studying viruses in the electron microscope. Preparative procedures for examining icosahedral and filamentous viruses. *J. Ultrastruct. Res.* **47**, 361-383.
- Howe L., Itoh T., Katagiri C., Ausió J. (1998) The histone binding protein nucleoplasmin does not facilitate binding of transcription factor IIIA to nucleosomal *Xenopus laevis* 5S rRNA genes. *Biochemistry* **37**, 1174-1177.
- Ishimi Y., Hirosumi J., Sato W., Sugasawa K., Yokota S., Hanaoka F., Yamada M. (1984) Purification and initial characterization of a protein which facilitates assembly of nucleosome-like structure from mammalian cells. *Eur. J. Biochem.* **142**, 431-439.

- Ishimi Y., Kikuchi A. (1991) Identification and molecular cloning of yeast homolog of nucleosome assembly protein I which facilitates nucleosome assembly *in vitro*. *J. Biol. Chem.* **266**, 7025-7029.
- Ishimi Y., Kojima M., Yamada M., Hanaoka M. (1987) Binding mode of nucleosome-assembly protein (NAP-1) and histone. *Eur. J. Biochem.* **162**, 19-24.
- Ito T., Bulger M., Kobayashi R., Kadonaga J.T. (1996) *Drosophila* NAP-1 is a core histone chaperone that functions in ATP-facilitated assembly of regularly spaced nucleosomal arrays. *Mol. Cell. Biol.* **16**, 3112-3124.
- Ito T., Bulger M., Pazin M.J., Kobayashi R., Kadonaga J.T. (1997) ACF, an ISWI-containing and ATP-using chromatin assembly and remodeling factor. *Cell* **90**, 145-155.
- Itoh T., Ausi   J., Katagiri C. (1997) Histone H1 variants as sperm-specific nuclear proteins of *Rana catesbeiana*, and their role in maintaining a unique condensed state of sperm chromatin. *Mol. Rep. Dev.* **47**, 181-190.
- Itoh T., Ohsumi K., Katagiri C. (1993) Remodeling of human sperm chromatin mediated by nucleoplasmin from amphibian eggs. *Dev. Growth Differ.* **35**, 59-66.
- Iwata K., Hozumi K., Iihara A., Nomizu M., Sakairi N., Nishi N. (1999) Mechanism of salmon sperm decondensation by nucleoplasmin. *Int. Journ. Biol. Macrom.* **26**, 95-101.
- Iwata K., Hozumi K., Itoh T., Sakairi N., Tokura S., Katagiri C., Nishi N. (1997) Conformation of nucleoplasmin and its interaction with DNA-protamine complex as a simple model of fish sperm nuclei. *Int. J. Biol. Macrom.* **20**, 171-178.
- Jancarik J., Kim S. (1991) Sparse matrix sampling: a screening method for crystallization of proteins. *J. Appl. Cryst.* **24**, 409-411.
- Jensenius J.C., Andersen I., Hau J., Crone M., Koch C. (1981) Eggs: conveniently package antibodies. Methods for purification of yolk IgG. *Jour. of Immuno. Met.* **46**, 63-68.
- Johnson W.C. (1999) Analysing protein circular dichroism spectra from accurate secondary structures. *Proteins: Struct. Funct. Genet.* **35**, 307-312.
- Jordan A. (1982) Tesi doctoral: "Proteïnes nuclears espermàtiques de l'equinoderm *Holothuria tubulosa*: caracteritzaci   i seq  uència de la proteïna ϕ_0 : estudi de la interacci   ϕ_0 -DNA per difracci   de raigs X". Universitat de Barcelona.
- Kalderon D., Richardson W.D., Markham A.T., Smith A.E. (1984) Sequence requirements for nuclear location of simian virus 40 large T antigen. *Nature* **311**, 33-38.
- Kalinich J.F., McClain D.E. (1994) Rapid isolation of nuclear transport-competent *Xenopus* nucleoplasmin produced in *Escherichia coli* strain BL21(DE3). *Protein Exp. and Purif.* **5**, 324-330.
- Kamakaka R.T., Bulger M., Kadonaga J.T. (1993) Potentiation of RNA polymerase II transcription by Gal4-VP16 during but not after DNA replication and chromatin assembly. *Genes and Devel.* **7**, 1779-1795.
- Kamakaka R.T., Bulger M., Kaufman P.D., Stillman B., Kadonaga J.T. (1996) Postreplicative chromatin assembly by *Drosophila* and human Chromatin Assembly Factor 1. *Mol. and Cel. Biol.* **16**, 810-817.
- Kasinsky H.E. (1989) "Specificity and distribution of sperm basic proteins." Histones and other basic nuclear proteins. Hnilca L.S., Stein G.S., Stein J.L. Ed. CRC Press.

- Kasinsky H.E., Huang S.Y., Mann M., Roca J., Subirana J.A. (1985) On the diversity of sperm histones in the vertebrates. IV. Cytochemical and amino acid analysis in Anura. *J. Exp. Zool.* **234**, 33-46.
- Kasinsky H.E., Lewis J.D., Dacks J.B., Ausió J. (2001) Origin of H1 linker histones. *The FASEB Jour.* **15**, 34-42.
- Katagiri C., Ohsumi K (1994) Remodeling of sperm chromatin induced in egg extracts of amphibians. *Int. J. Dev. Biol.* **38**, 209-216.
- Kaufman P.D., Kobayashi R., Kessler N., Stillman B. (1995) The p150 and p60 subunits of chromatin assembly factor I: a molecular link between newly synthesized histones and DNA replication. *Cell* **81**, 1105-1114.
- Kawasaki K., Philpott A., Avilion A.A., Berrios M., Fisher P.A. (1994) Chromatin decondensation in *Drosophila* embryo extracts. *J. Biol. Chem.* **269**, 10169-10176.
- Kellner R., Lottspeich F., Meyer H.E. (1999) Microcharacterization of proteins. 2nd. edition. Wiley-VCH.
- Khrone G., Franke W.W. (1980a) Immunological identification and localization of the predominant nuclear protein of the amphibian oocyte nucleus. *Proc. Natl. Acad. Sci. USA* **77**, 1034-1038.
- Khrone G., Franke W.W. (1980b) A major soluble acidic protein located in nuclei of diverse vertebrate species. *Expt. Cell Res.* **129**, 167-189.
- Kleinschmidt J.A., Dingwall C., Maier G., Franke W.W. (1986) Molecular characterization of a karyophilic, histone binding protein: cDNA cloning, amino acid sequence and expression of nuclear protein N1/N2 of *Xenopus laevis*. *The EMBO Jour.* **5**, 3547-3552.
- Kleinschmidt J.A., Franke W.W. (1982) Soluble acidic complexes containing histones H3 and H4 in nuclei of *Xenopus laevis* oocytes. *Cell* **29**, 799-809.
- Kleinschmidt J.A., Fortkamp E., Krohne G., Zentgraf H., Franke W.W. (1985) Co-existence of two different types of soluble histone complexes in nuclei of *Xenopus laevis* oocytes. *Journ. Biol. Chem.* **260**, 1166-1176.
- Kleinschmidt J.A., Seiter A. (1988) Identification of domains involved in nuclear uptake and histone binding of protein N1 of *Xenopus laevis*. *The EMBO Jour.* **7**, 1605-1614.
- Kleinschmidt J.A., Seiter A., Zentgraf H. (1990) Nucleosome assembly *in vitro*: separate histone transfer and synergistic interaction of native histone complexes purified from nuclei of *Xenopus laevis* oocytes. *The EMBO Jour.* **9**, 1309-1318.
- Kornberg R.D. (1974) Chromatin structure: a repeating unit of histones and DNA. *Science* **184**, 868-871.
- Kornberg R.D., Lorch Y. (1991) Irresistible force meets immovable object: transcription and the nucleosome. *Cell* **67**, 833-836.
- Kornberg R.D., Lorch Y. (1999) Twenty-five years of the nucleosome, fundamental particle of the eukaryote chromosome. *Cell* **98**, 285-294.
- Kornberg R.D., Thomas J.O. (1974) Chromatin structure: oligomers of the histones. *Science* **184**, 865-868.
- Krude T. (1999) Chromatin assembly during DNA replication in somatic cells. *Eur. J. Biochem.* **263**, 1-5.

- Laemmli U.K. (1970) Cleavage of structural proteins during the assembly of the head of bacteriophage T4. *Nature* **277**, 680-688.
- Lanford R.E., Butel J.S. (1984) Construction and characterization of an SV40 mutant defective in nuclear transport of T antigen. *Cell* **37**, 801-813.
- Laskey R.A., Honda B.M., Mills A.D., Finch J.T. (1978) Nucleosomes are assembled by an acidic protein which binds histones and transfers them to DNA. *Nature* **275**, 416-420.
- Laskey R.A., Mills A.D., Morris N.R. (1977) Assembly of SV40 chromatin in a cell-free system from *Xenopus* eggs. *Cell* **10**, 237-243.
- Lehrman S.R., Tuls J.L., Lund M. (1990) Peptide alpha-helicity in aqueous trifluoroethanol: correlations with predicted alpha-helicity and the secondary structure of the corresponding regions of bovine growth hormone. *Biochemistry* **29**, 5590-5596.
- Leno G.H., Mills A.D., Philpott A., Laskey R.A. (1996) Hyperphosphorylation of nucleoplasmin facilitates *Xenopus* sperm decondensation at fertilization. *J. Biol. Chem.* **271**, 7253-7256.
- Leno G.H., Philpott A., Laskey R.A. (1993) The chromosome: chromatin remodelling by nucleoplasmin. Heslop-Harrison J.S., Havell R.B. Ed. pp 135-147. Bios-Scientific Pub. Oxford.
- LeRoy G., Orphanides G., Lane W.S., Reinberg D. (1998) Requirement of RSF and FACT for transcription of chromatin templates *in vitro*. *Science* **282**, 1900-1904.
- Lohka M.J., Masui Y. (1983) Formation *in vitro* of sperm pronuclei and mitotic chromosomes induced by amphibian ooplasmic components. *Science* **220**, 719-721.
- Longo F. (1981) Regulation of pronuclear development. Jagiello G., Vogel C. Ed. Bioregulators of reproduction. Academic Press. New York.
- Longo F.J., Kunkle M. (1978) Transformations of sperm nuclei upon insemination. *Curr. Topics Dev. Biol.* **12**, 149-184.
- Looman A.C., Bodlaender J., Comstock L.J., Eaton D., Ihurani P., de Boer H.A., van Knippenberg P.H. (1987) Influence of the codon following the AUG initiation codon on the expression of a modified lacZ gene in *Escherichia coli*. *The EMBO Jour.* **6**, 2489-2492.
- Lowry O.H., Rosebrough A.L., Farr A.L., Randall R.J. (1951) Protein measurement: with the Folin phenol reagent. *J. Biol. Chem.* **193**, 265-275.
- Luger K., Mäder A.W., Richmond R.K., Sargent D.F., Richmond T.J. (1997) Crystal structure of the nucleosome core particle at 2.8 Å resolution. *Nature* **389**, 251-260.
- MacArthur C.A., Shackleford G.M. (1997) Npm3: A novel, widely expressed gene encoding a protein related to the molecular chaperones nucleoplasmin and nucleophosmin. *Genomics* **42**, 137-140.
- Malkin A.J., Kuznetsov Y.G., Land T.A., DeYoreo J.J., McPherson A. (1995) Mechanisms of growth for protein and virus crystal. *Nat. Struct. Biol.* **2**, 956- 959.
- Mann M., Risley M.S., Eckhardt R.A., Kasinsky H.E. (1982) Characterization of spermatid/sperm basic chromosomal proteins in the genus *Xenopus* (Anura, Pipidae). *J. Exp. Zool.* **222**, 173-186.
- Mandel M., Higa A. (1970) Calcium dependent bacteriophage DNA infection. *J. Mole. Biol.* **53**, 159-162.

- McPherson A. (1990) Current approaches to macromolecular crystallization. *Eur. J. Biochem.* **189**, 1-23.
- McPherson A. (1999) Crystallization of biological macromolecules. Cold Spring Harbor Laboratory Press.
- Mello J.A., Almouzni G. (2001) The ins and outs of nucleosome assembly. *Current Opin. in Genet. and Devel.* **11**, 136-141.
- Mills A.D., Laskey R.A., Black P., De Robertis E.M. (1980) An acidic protein which assembles nucleosomes *in vitro* is the most abundant protein in *Xenopus* oocytes nuclei. *J. Mole. Biol.* **139**, 561-568.
- Moffatt B.A., Studier F.W. (1987) T7 lysis inhibits transcription by T7 RNA polymerase. *Cell* **49**, 221-227.
- Moggs J.G., Grandi P., Quivy J.P., Jonsson Z.O., Hubscher U., Becker P.B., Almouzni G. (2000) A CAF-1-PCNA-mediated chromatin assembly pathway triggered by sensing DNA damage. *Mol. Cell. Biol.* **20**, 1206-1218.
- Moore S., Stein W.H. (1963) Chromatographic determination of amino acids by the use of automatic recording equipment. *Methods Enzymol.* **6**, 819-831.
- Morales V., Richard-Foy H. (2000) Role of histone N-terminal tails and their acetylation in nucleosome dynamics. *Mol. and Cel. Biol.* **20**, 7230-7237.
- Moreau N., Angelier N., Bonnanfant-Jais M., Gounon P., Kubisz P. (1986) Association of nucleoplasmin by immunolocalization in the amphibian oocyte. *Journ. Cell Biol.* **103**, 683-690.
- Mossamaparast N., Ewarts C.S., Pemberton L.F. (2002) A role of nucleosome assembly protein 1 in the nuclear transport of histones H2A and H2B. *The EMBO Jour.* **21**, 6527-6538.
- Munakata T., Adachi N., Yokoyama N., Kuzuhara T., Horikoshi M. (2000) A human homologue of yeast anti-silencing factor has histone chaperone activity. *Genes Cells* **5**, 221-233.
- Nakajima H., Matoba K., Matsumoto Y., Hongo T., Kiritaka K., Sugino H., Nagamatsu Y., Hamaguchi Y., Ikegami S. (2000) Molecular characterization of a novel nucleolar protein in starfish oocytes which is phosphorylated before and during oocyte maturation. *Eur. Journ. Bioch.* **267**, 295-304.
- Namboodiri V.M., Dutta S., Akey I.V., Head J.F., Akey C. W. (2003) The crystal structure of *Drosophila* NLP-core provides insight into pentamer formation and histone binding. *Structure* **11**, 175-186.
- Nightingale K., Dimitrov S., Reeves R., Wolffe A. (1996) Evidence for a shared structural role for HMG1 and linker histones B4 and H1 in organizing chromatin. *The EMBO Jour.* **15**, 548-561.
- Nelson T., Hsieh T., Brutlag D. (1979) Extracts of *Drosophila* embryos mediate chromatin assembly *in vitro*. *Proc. Natl. Acad. Sci. USA* **76**, 5510-5514.
- Nelson T., Wiegand R., Brutlag D. (1981) Ribonucleic acid and other polyanions facilitate chromatin assembly *in vitro*. *Biochemistry* **20**, 2594-2601.
- Newmeyer D.D., Lucocq J.M., Bürglin T.R., De Robertis E. M. (1986) Assembly *in vitro* of nuclei active in nuclear protein transport: ATP is required for nucleoplasmin accumulation. *The EMBO Jour.* **5**, 501-510.

- O'Brien J.P., Fahnestock S.R., Tormonia Y., Gardner K.H. (1998) Nylons from nature: synthetic analogs to spider silk. *Advanced materials* **10**, 1185-1195.
- O'Neill T.E., Smith J.G., Bradbury E.M. (1993) Histone octamer dissociation is not required for transcript elongation through arrays of nucleosome cores by phage T7 RNA polymerase *in vitro*. *Proc. Natl. Acad. Sci. USA* **90**, 6203-6207.
- Ohsumi K., Katagiri C. (1991) Characterization of the ooplasmic factor inducing decondensation of and protamine removal from toad sperm nuclei: involvement of nucleoplasmin. *Dev. Biol.* **148**, 295-305.
- Ohsumi K., Shimada A., Okumura E., Kishimoto T., Katagiri C. (1995) Dependence of removal of sperm-specific protein from *Xenopus* sperm nuclei on the phosphorylation state of nucleoplasmin. *Dev. Growth Differ.* **37**, 329-336.
- Olins A.L., Olins D.E. (1974) Spheroid chromatin units (v bodies). *Science* **183**, 330-332.
- Olivares C., Azorín F., Subirana J.A., Cornudella L. (1987) The interaction of the histone H1-related protein ϕ_0 with chromatin. *Biophys. Chem.* **28**, 51-77.
- Okuwaki M., Iwamatsu A., Tsujimoto K., Nagata K. (2001) Identification of nucleophosmin/B23, and acidic nucleolar protein, as a stimulatory factor for *in vitro* replication of adenovirus DNA complexed with viral basic core proteins. *J. Mole. Biol.* **311**, 41-55.
- Pace C.N., Vajdos F., Fee L., Grimsley G., Gray T. (1995) How to measure and predict the molar absorption coefficient of a protein. *Protein Sci.* **4**, 2411-2423.
- Perczel A., Hollosi M., Tusnady G., Fasman G.D. (1991) Convex constraint analysis: A natural deconvolution of circular dichroism curves of proteins. *Protein Eng.* **4**, 669-679.
- Perkins S.J. (1986) Protein volumes and hydration effects. The calculations of partial specific volumes, neutron scattering matchpoints and 280-nm absorption coefficients for proteins and glycoproteins from amino acid sequences. *Eur. J. Biochem.* **157**, 169-180.
- Peterson G.L. (1979) Review of the Folin phenol protein quantitation method of Lowry, Rosebrough, Farr and Randall. *Anal. Biochem.* **100**, 201-220.
- Philip M., Jamaluddin M., Sastry R.V., Chandra H.S. (1979) Nucleosome core histone complex isolated gently and rapidly in 2 M NaCl is octameric. *Proc. Natl. Acad. Sci. USA* **76**, 5178-5182.
- Philpott A., Krude T., Laskey R.A. (2000) Nuclear chaperones. *Cell Dev. Biol.* **11**, 7-14.
- Philpott A., Leno G.H. (1992) Nucleoplasmin remodels sperm chromatin in *Xenopus* egg extracts. *Cell* **69**, 759-767.
- Philpott A., Leno G.H., Laskey R.A. (1991) Sperm decondensation in *Xenopus* egg cytoplasm is mediated by nucleoplasmin. *Cell* **65**, 569-578.
- Poccia D. (1986) Remodeling of nucleoproteins during gametogenesis, fertilization and early development. *Int. Rev. Cytol.* **105**, 1-65.
- Poccia D., Collas P. (1996) Transforming sperm nuclei into male pronuclei *in vivo* and *in vitro*. *Curr. Topics Develop. Biol.* **34**, 25-88.
- Poccia D.L., Greenough T., Green G.R., Nash E., Erickson J., Gibbs M. (1984) Remodeling of sperm chromatin following fertilization. Nucleosome repeat length and histone variant transitions in the absence of DNA synthesis. *Dev. Biol.* **104**, 274-286.

- Poccia D., Salik J., Krystal G. (1981) Transitions in histone variants of the male pronucleus following fertilization and evidence for a maternal store of cleavage-state histones in the sea urchin egg. *Dev. Biol.* **82**, 287-296.
- Pokorska A., Drevet C., Scazzocchio C. (2000) The analysis of the transcriptional activator PrnA reveals a tripartite nuclear localisation sequence. *J. Mole. Biol.* **298**, 585-596.
- Polson A., von Wechmar M.B. (1980) Isolation of viral IgY antibodies from yolks of immunized hens. *Immuno. Commun.* **9**, 475-493.
- Porath J., Carlsson J., Olsson I., Belfrage G. (1975) Metal chelate affinity chromatography, a new approach to protein fractionation. *Nature* **258**, 598-599.
- Prats E. (1989) Tesi doctoral: "Clonatge molecular i seqüènciació del cDNA per la proteïna ϕ_0 d'esperma de l'equinoderm *Holothuria tubulosa* i aïllament de clons genòmics". Universitat de Barcelona.
- Prats E., Cornudella L., Ruiz-Carrillo A. (1989) Nucleotide sequence of a cDNA for ϕ_0 , a histone to protamine transition protein from sea cucumber spermatozoa. *Nuc. Ac. Res.* **23**, 10097
- Prieto C. (2002) Tesi doctoral: "Caracterització de la nucleoplasmina de *X. laevis* i la seva interacció amb proteïnes bàsiques". Universitat Politècnica de Catalunya.
- Prieto C., Saperas N., Arnan C., Hills M.H., Wang X., Chiva M., Aligué R., Subirana J.A., Ausiò J. (2002) Nucleoplasmin interaction with protamines. Involvement of the polyglutamic tract. *Biochemistry* **41**, 7802-7810.
- Provencher S.W., Glöckner J. (1981) Estimation of protein secondary structure from circular dichroism. *Biochemistry* **20**, 33-37.
- Puigjaner L.C., Fita I., Arnott S., Chandrasekaran R., Subirana J.A. (1986) Modelling and refinement of the crystal structure of nucleoprotamine from *Gibbula divaricata*. *J. Biomolec. Struct. Dynamics* **3**, 1067-1078.
- Ramage P., Hemmig R., Mathis B., Cowan-Jacob S.W., Rondeau J.M., Blommers M.J.J., Zurini M., Rüdiger S. (2002) Snags with tags: Some observations made with (His)₆-tagged proteins. *Life Science News* **11**. Amersham Biosciences.
- Recacha M.R. (1996) Tesi doctoral: "Análisis estructural de la insulina cristalizada con protaminas y péptidos básicos sintéticos por cristalográfia de rayos X." Universitat Politècnica de Catalunya.
- Rice P., Garduño R., Itoh T., Katagiri C., Ausiò J. (1995) Nucleoplasmin-mediated decondensation of *Mytilus* sperm chromatin. Identification and partial characterization of nucleoplasmin-like protein with sperm-nuclei decondensing activity in *Mytilus californianus*. *Biochemistry* **34**, 7563-7568.
- Richmond T., Finch J.T., Rushton B., Rhodes D., Klug A. (1984) Structure of the nucleosome core particle at 7 Å resolution. *Nature* **311**, 532-537.
- Riddles P.W., Blakeley R.L., Zerner B. (1983) Reassessment of Ellman's reagent. *Methods in Enzymology* **91**, 49-60.
- Robbins J., Dilworth S.M., Laskey R.A., Dingwall C. (1991) Two interdependent basic domains in nucleoplasmin nuclear targeting sequence: identification of a class of bipartite nuclear targeting sequence. *Cell* **64**, 615-623.
- Rosenberg A.H., Lade B.N., Chui D.S., Lin S.W., Dunn J.J., Studier F.W. (1987) Vectors for selective expression of cloned DNAs by T7 RNA polymerase. *Gene* **56** (1), 125-135.

- Ruiz-Carrillo A., Jorcano J.L. (1979) An octamer of core histones in solution. Central role of the H3-H4 tetramers in the self-assembly. *Biochemistry* **18**, 760-768.
- Ruiz-Carrillo A., Jorcano J.L., Eder G., Lurz R. (1979) *In vitro* core particle and nucleosome assembly at physiological ionic strength. *Proc. Natl. Acad. Sci. USA* **76**, 3284-3288.
- Sambrook J., Fritsch E.F., Maniatis T. (1989) Molecular cloning. A laboratory manual (2nd ed.). Cold Spring Harbor Laboratory Press.
- Sanger F., Coulson A.R. (1978) The use of thin acrylamide gels for DNA sequencing. *FEBS letters.* **87**, 107-110.
- Saperas N. (1992) Tesi doctoral: "Distribució i caracterització de les proteïnes espermàtiques bàsiques en peixos, agnats i procordats". Universitat Politècnica de Catalunya.
- Saperas N., Chiva M., Aligué R., Itoh T., Katagiri C., Subirana J.A., Ausió J. (1999) Physicochemical and functional comparison of *Xenopus laevis* nucleoplasmin obtained from oocytes and from overexpression in bacteria. *Arch. Biochem. Biophys.* **361**, 135-141.
- Saperas N., Ribes E., Buesa C., García-Hegart F., Chiva M. (1993) Differences in chromatin condensation during spermiogenesis in two species of fish with distinct protamines. *Journ. Exp. Zool.* **265**, 186-194.
- Savic A., Richman P., Williamson P., Poccia D. (1981) Alterations in chromatin structure during early sea urchin embryogenesis. *Proc. Natl. Acad. Sci. USA* **78**, 3706-3710.
- Schmid F.X. (1997) Protein Structure. A practical approach. Optical spectroscopy to characterize protein conformation and conformatinal changes. Creighton T.E. Ed. (2nd ed.). Oxford University Press.
- Schmidt-Zachmann M.S., Franke W.W. (1988) DNA cloning and amino acid sequence determination of a major constituent protein of mammalian nucleoli. Correspondence of the nucleoplasmin-related protein NO38 to mammalian protein B23. *Chromosoma* **96**, 417-426.
- Schmidt-Zachmann M.S., Hugle-Dorr B., Franke W.W. (1987) A constitutive nucleolar protein identified as a member of the nucleoplasmin family. *The EMBO Jour.* **6**, 1881-1890.
- Scopes R.K. (1974) Measurement of protein by spectrophotometry at 205 nm. *Anal. Biochem.* **59**, 277-282.
- Scopes R.K. (1982) Protein purification. Principles and practice. Springer-Verlag. New York.
- Sealy L., Cotten M., Chalkley R. (1986) *Xenopus* nucleoplasmin: egg vs. oocyte. *Biochemistry* **25**, 3064-3072.
- Shackleford G.M., Ganguly A., MacArthur C.A. (2001) Cloning, expression and nuclear localization of human Npm3, a member of the nucleophosmin/nucleoplasmin family of nuclear chaperones. *BMC Genomics* **2**:8.
- Shibahara K., Stillman B. (1999) Replication-dependent marking of DNA by PCNA facilitates CAF-1-coupled inheritance of chromatin. *Cell* **96**, 575-585.
- Simon H.U., Mills G.B., Kozlowski M., Hogg D., Branch D., Ishimi Y., Siminovitch K.A. (1994) Molecular characterization of hNRP, a cDNA encoding a human nucleosome-assembly-protein-I-related gene product involved in the induction of cell proliferation. *Biochem. J.* **297**, 389-397.

- Slavotinek A.M., Biesecker L.G. (2001) Unfolding the role of chaperones and chaperonins in human disease. *Trends in Genetics* **17**, 528-535.
- Smith R.C., Dworkin-Rast E., Dworkin M.B. (1988) Expression of a histons H1-like protein is restricted to early *Xenopus* development. *Genes Dev.* **2**, 1284-295.
- Smith S., Stillman B. (1989) Purification and characterization of CAF-1, a human cell factor required for chromatin assembly during DNA replication *in vitro*. *Cell* **58**, 15-25.
- Smith S., Stillman B. (1991) Stepwise assembly of chromatin during DNA replication *in vitro*. *The EMBO Jour.* **10**, 971-980.
- Sönnichsen F.D., Van Eyk J.E., Hodges R.S., Sykes B.D. (1992) Effect of trifluoroethanol on protein secondary structure: an NMR and CD study using a synthetic actin peptide. *Biochemistry* **31**, 8790-8798.
- Southern E.M. (1975) Detection of specific sequences among DNA fragments separated by gel electrophoresis. *J. Mole. Biol.* **98**, 503-517.
- Sreerama N., Woody R.W. (1993) A self-consistent method for the analysis of protein secondary structure from circular dichroism. *Anal. Biochem.* **209**, 32-44.
- Sreerama N., Woody R.W. (2000) Estimation of protein secondary structure from circular dichroism spectra: comparision of CONTIN, SELCON and CDSSTR methods with an expanded reference set. *Anal. Bioch.* **287**, 252-260.
- Stein A. (1979) DNA folding by histones: the kinetics of chromatin core particle reassembly and the interaction of nucleosomes with histones. *J. Mol. Biol.* **130**, 103-134.
- Stein A., Whitlock J.P., Bina M. (1979) Acidic polypeptides can assemble both histones and chromatin *in vitro* at physiological ionic strength. *Proc. Natl. Acad. Sci. USA* **76**, 5000-5004.
- Stephens S., Beyer B., Balthazar-Stablein V., Duncan R., Kostakos M., Lukoma M., Green G.R., Poccia D. (2002) Two kinases activities are sufficient for sea urchin sperm chromatin decondensation *in vitro*. *Mol. Reprod. Develop.* **62**, 496-503.
- Stillman B. (1986) Chromatin assembly during SV40 DNA replication *in vitro*. *Cell* **45**, 555-565.
- Studier F.W. (1991) Use of bacteriophage T7 lysis to improve an inducible T7 expression system. *J. Mole. Biol.* **219**, 37-44.
- Studier F.W., Moffatt, B.A. (1986) Use of bacteriophage T7 RNA polymerase to direct selective high-level expression of cloned genes. *J. Mole. Biol.* **189**, 113-130.
- Studier F.W., Rosenberg A.H., Dunn J.J., Dubendorff, J.W. (1990) Use of T7 RNA polymerase to direct expression of cloned genes. *Meth. Enzymol.* **185**, 60-89.
- Saua P., Subirana J.A. (1977) X-ray diffraction studies of nucleoprotamine structure. *J. Molec. Biol.* **17**, 909-926.
- Subirana J.A. (1983) Nuclear proteins in spermatozoa and their interactions with DNA. The sperm cell. André J. Ed. Martinus Nijhoff. The Hague.
- Subirana J.A. (1985) Estructura del ADN. Col·lecció Exedra, nº 147. Editorial Alhambra.
- Subirana J.A. (1990) Proteins as counterions of DNA: A new model of nucleoprotamine structure. Water and ions in biomolecular systems. D. Valiescu et al. Eds. Birkhäuser Verlag AG. Basel. 63-70.

- Subirana J.A. (1992) Order and disorder in 30 nm chromatin fiber. *FEBS letters* **302**, 105-107.
- Subirana J.A., Cozcolluela C., Palau J., Unzeta M. (1973) Protamines and other basic proteins from spermatozoa of molluscs. *Biochm. Biophys. Acta* **317**, 364-379.
- Subirana J.A., Muñoz-Guerra S., Aymami J., Rademacher M., Frank J. (1985) The layered organization of nucleosomes in 30 nm chromatin fibers. *Chromosoma* **91**, 377-390.
- Subirana J.A., Palau J. (1968) Histone-like proteins from the sperm of echinoderms. *Exp. Cell. Res.* **53**, 471-477
- Sulkowski E. (1985) Purification of protein by IMAC. *Trends Biotech.* **3**, 1-7.
- Sugawa H., Imamoto N., Wataya-Kaneda M., Uchida T. (1985) Foreign protein can be carried into the nucleus of mammalian cell by conjugation with nucleoplasmin. *Exp. Cell Res.* **159**, 419-429.
- Svedberg T., Pederson K.O. (1940) The Ultracentrifuge. Oxford University Press. Oxford.
- Tabernero L. (1991) Tesi doctoral: "Cristal·lografia de fragments d'histones riques en lisina i complexes d'oligonucleòtids amb drogues." Universitat Politècnica de Catalunya.
- Takamune K., Nishida K., Takai H., Katagiri C. (1991) Primary structure of toad sperm protamines and nucleotide sequences of their cDNAs. *Eur. J. Biochem.* **196**, 401-406.
- Takemura M., Ohoka F., Perpelescu M., Ogawa M., Matsushita H., Takaba T., Akiyama T., Umekawa H., Furuichi Y., Cook P.R., Yoshida S. (2002) Phosphorylation-dependent migration of retinoblastoma protein into the nucleolus triggered by binding to nucleophosmin/B23. *Exp. Cell Res.* **276**, 233-241.
- Talcott B. i Moore M.S. (1999) Getting across the nuclear pore complex. *Trends in cell Biol.* **9**, 312-318.
- Tarapore P., Okuda M., Fukasawa K. (2002) A mammalian *in vitro* centriole duplication system: evidence for involvement of CDK2/cyclin E and nucleophosmin/B23 in centrosome duplication. *Cell Cycle* **1**, 75-81.
- Thomas J.O., Butler P.J. (1977) Characterization of the octamer of histones free in solution. *J. Mole. Biol.* **116**, 769-781.
- Tiselius A., Hjerten S., Levin O. (1956) Protein chromatography on calcium phosphate columns. *Arch. Biochem. Biophys.* **65**, 132-136.
- Towbin H., Staehelin T., Gordon J. (1979) Electrophoretic transfer of proteins from polyacrilamide gels to nitrocellulose sheets: Procedure and some applications. *Proc. Natl. Acad. Sci. USA* **76**, 4350-4356.
- Townend R., Kumosinki T.F., Timasheff S.N., Fasman G.D., Davidson B. (1966) The circular dichroism of the beta structure of poly-L-lysine. *Biochem. Biophys. Res. Comm.* **23**, 163-169.
- Tsukiyama T., Becker P.B., Wu C. (1994) ATP-dependent nucleosome disruption at a heat-shock promoter mediated by binding of GAGA transcription factor. *Nature* **367**, 525-532.
- Tyler J.K., Collins K.A., Prasad-Sinha J., Amiott E., Bulger M., Harte P.J., Kobayashi R., Kadonaga J.T. (2001) Interaction between the *Drosophila* CAF-1 and ASF-1 chromatin assembly factors. *Mole. Cell Biol.* **21**, 6574-6584.

- van Holde K.E. (1975) The proteins. Neurath H., Hill R.L., Boeder C-L. Eds. 3rd ed. Vol. 1, pp.225-291. Academic Press. New York.
- van Holde K.E. (1989) Chromatin. Springer-Verlag. New York Inc.
- van Holde K.E., Weischet W.O. (1978) Boundary analysis of sedimentation velocity experiments with monodisperse and paucidisperse solutes. *Biopolymers* **17**, 1387-1403.
- van Holde K.E., Lohr D.E., Robert C. (1992) What happens to nucleosomes during transcription? *J. Biol. Chem.* **267**, 2837-2840.
- Vancurova I., Paine T.M., Lou W., Paine P.L. (1995) Nucleoplasmin associates with and is phosphorylated by casein kinase II. *Journ. of Cell Sci.* **108**, 779-787.
- Vancurova I., Vancurova A., Lou W., Paine P.L. (1997) A domain distinct from nucleoplasmin's nuclear localization sequence influences its transport. *Bioch. and Biop. Res. Com.* **235**, 19-25.
- Varga-Weisz P.D., Wilm M., Bonte E., Dumas K., Mann M., Becker P.B. (1997) Chromatin-remodelling factor CHARC contains the ATPases ISWI and topoisomerase II. *Nature* **388**, 598-602.
- Verdaguer N., Perelló M., Palau J., Subirana J.A. (1993) Helical structure of basic proteins from spermatozoa. Comparison with model peptides. *Eur. J. Biochem.* **214**, 879-887.
- Verrealut A. (2000) *De novo* nucleosome assembly: new pieces in an old puzzle. *Genes and Devel.* **14**, 1430-1438.
- Verreault A., Kaufman P.D., Kobayashi R., Stillman B. (1996) Nucleosome assembly by a complex of CAF-1 and acetylated histones H3/H4. *Cell* **87**, 95-104.
- Vignali M., Hassan A.H., Neely K.E., Workman J.L. (2000) ATP-dependent chromatin-remodeling complexes. *Mol. Cell. Biol.* **20**, 1899-1910.
- Vodicka M., Green G.R., Poccia D.L. (1990) Sperm histones and chromatin structure of the "primitive" sea urchin *Eucidaris tribuloides*. *J. Exp. Biol.* **256**, 179-188.
- Von Holt C., deGroot P., Schwager S., Brandt W.F. (1984) The structure of sea urchin histones and considerations of their function. Stein G.S., Stein J.L., Marzluff W.F. Ed. Histone Genes. Wiley, New York.
- Walter P.P., Owen-Hughes T.A., Côté J., Workman J.L. (1995) Stimulation of transcription factor binding and histone displacement by nucleosome assembly protein 1 and nucleoplasmin requires disruption of the histone octamer. *Mol. Cel. Biol.* **15**, 6178-6187.
- Wang X., Moore S.C., Laszczak M., Ausió J. (2000) Acetylation increases the α -helical content of the histone tails of the nucleosome. *Journ. Biol. Chem.* **45**, 35013-35020.
- Weber F., Keppel F., Georgopoulos C., Hayer-Hartl M.K., Ulrich Hartl F. (1998) The oligomeric structure of GroEL/GroES is required for biologically significant chaperonin function in protein folding. *Nat. Struct. Biol.* **5**, 977-985.
- Weintraub H., Worcel A., Alberts B. (1976) A model for chromatin based upon two symmetrically paired half-nucleosomes. *Cell* **9**, 409-417.
- Wells B., Horne R.W., Shaw P.J. (1981) The formation of two-dimensional arrays of isometric plant viruses in the presence of polyethylene glycol. *Micron* **12**, 37-45.
- Widlund H.R., Vitolo J.M., Thiriet C., Hayes J.J. (2000) DNA sequence-dependent contributions of core histone tails to nucleosome stability: differential effects of acetylation and proteolytic tail removal. *Biochemistry* **39**, 3835-3841.

- Wilkosz P.A., Chandrasekhar K., Rosenberg J.M. (1995) Preliminary characterization of EcoRI-DNA co-crystals: incomplete factorial design of oligonucleotide sequences. *Acta Cryst. D* **51**, 938-945.
- Wingfield P.T. (1995) Coligan J.E., Dunn B.M., Ploegh H., Speicher D.W., Wingfield P.T. Ed. Current protocols in protein science. Vol. 1. New York. John Wiley and sons.
- Woodcock C.L.F., Frado L.L.Y. Rattner J.B. (1984) The higher structure of chromatin: evidence for a helical ribbon arrangement. *J. Cell Biol.* **99**, 42-52.
- Woodland H.R., Adamson E.D. (1977) The synthesis and storage of histones during the oogenesis of *Xenopus laevis*. *Dev. Biol.* **57**, 118-135.
- Woody R.W. (1995) Circular dichroism. *Methods in Enzymology*. **246**, 34-71.
- Worcel A., Han S., Wong M.L. (1978) Assembly of newly replicated chromatin. *Cell* **15**, 969-977.
- Worcel A., Strogatz S., Riley D. (1981) Structure of chromatin and the linking number of DNA. *Proc. Natl. Acad. Sci. USA* **78**, 1461-1465.
- Wright S.J. (1999) Sperm nuclear activation during fertilization. *Current Topics Dev. Biol.* **46**, 133-178.
- Wüthrich K. (1989) Determination of three-dimensional protein structures in solution by nuclear magnetis resonance: an overview. *Methods in Enzymology* **177**, 125-131.
- Wüthrich K., Wider G., Wagner G., Braun W. (1982) Sequencial resonance assigments as a basis for determination of spatial protein structures by high resolution proton nuclear magnetic resonance. *J. Mole. Biol.* **155**, 311-319.
- Yang J.T., Wu C.C., Martinez H.M. (1986) Calculation of protein conformation from circular dichroism. *Methods in Enzymology* **130**, 208-269.
- Ye X., Sloboda R.D. (1997) Molecular characterization of p62, a mitotic apparatus protein required for mitotic progression. *J. Cell Biol.* **272**, 3606-3614.
- Yokota T., Takamune K., Katagiri C. (1991) Nuclear basic proteins of *Xenopus laevis* sperm: their characterization and synthesis during spermatogenesis. *Dev. Growth Differ.* **33**, 9-17.
- Zeller K.I., Haggerty T.J., Barrett J.F., Guo Q., Wonsey D.R., Dang C.V. (2001) Characterization of nucleophosmin (B23) as a Myc target by scanning chromatin immunoprecipitation. *J. Biol. Chem.* **276**, 48285-48291.
- Zentgraf H., Franke W.W. (1984) Differences of supranucleosomal organization in different kinds of chromatin: cell type-specific globular subunits containing different numbers of nucleosomes. *J. Cell Biol.* **99**, 272-286.
- Zhang Z., Shibahara K., Stillman B. (2000) PCNA connects DNA replication to epigenetic inheritance in yeast. *Nature* **408**, 221-225.
- Zirwes R.F., Schmidt-Zachmann M.S., Franke W.W. (1997) Identification of a small, very acidic constitutive nucleolar protein (NO29) as a member of the nucleoplasmmin family. *Proc. Natl. Acad. Sci. USA* **94**, 11387-11392.
- Zucher K., Worcel A. (1990) The histone H3/H4-N1 complex supplemented with histone H2A-H2B dimers and DNA topoisomerase I forms nucleosomes on circular DNA under physiological conditions. *J. Biol. Chem.* **265**, 14487-14496.