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## **BIBLIOGRAFÍA**

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- Abeydeera LR, Day BN. Fertilization and subsequent development *in vitro* of pig oocytes inseminated in a modified tris-buffered medium with frozen-thawed ejaculated spermatozoa. *Biol Reprod* **1997**; 57:729-734.
- Abeydeera LR, Wang WH, Cantley TC, Prather RS, Day BN. Presence of beta-mercaptoethanol can increase the glutathione content of pig oocytes matured *in vitro* and the rate of blastocyst development after *in vitro* fertilization. *Theriogenology* **1998**; 50:747-756.
- Abeydeera LR. *In vitro* production of embryos in swine. *Theriogenology* **2002**; 57:256-273.
- Amano T, Mori T, Watanabe T. Activation and development of porcine oocytes matured *in vitro* following injection of inositol 1,4,5-trisphosphate. *Anim Reprod Sci* **2004**; 80:101-112.
- Anderson E, Albertini DF. Gap junctions between the oocyte and companion follicle cells in the mammalian ovary. *J Cell Biol* **1976**; 71:680-686.
- Austin CR. Observations on the penetrations of the sperm into the mammalian egg. *Aus J Sci Res* **1951**; 4:581-596.
- Avery B, Greve T. Development of *in vitro* fertilised bovine embryos exposed to 6-dimethylaminopurine prior to *in vitro* maturation. *Theriogenology* **1997**; 47:314.
- Bachvarova R. Gene expression during oogenesis and oocyte development in mammals. *Dev Biol* **1985**; 1:453-524.
- Banrezes B, Toth S, Huneau D, Schultz R, Ozil JP. A method to drive calcium signalling dynamics in fertilized mouse eggs. *Reprod Fert Dev* **2004**; 16 (1,2):268.
- Barends PM, Stroband HW, Taverne N, Kronnie G, Leen MP, Blommers PC. Integrity of the preimplantation pig blastocyst during expansion and loss of polar trophectoderm (Raubert cells) and the morphology of the embryoblast as an indicator for developmental stage. *J Reprod Fertil* **1989**; 87:715-726.
- Bazer FW, Geisert RD, Thatcher WW and Roberts RM. The establishment and maintenance of pregnancy. In *Control of Pig Reproduction* **1982**; pp 227-252 Eds DJA Cole and GR Foxcroft. Butterworth Scientific, London.
- Benoff, S. Carbohydrates and fertilization: an overview. *Mol Hum Reprod* **1997**; 3:599-637.

- Ben-Yosef D, Shalgi R. Oocyte activation: lessons from human infertility. *Trends Mol Med* **2001**; 7:163-169.
- Besenfelder U, Müller M y Brem G. Transgenics and modern reproductive technologies. En: Rothschild MF y Ruvinsky A (Eds). *The genetics of the pig*. CAB International **1998**; 345-374.
- Braw-Tal R. The initiation of follicle growth: the oocyte or the somatic cells? *Mol Cell Endocrinol* **2002**; 187:11-18.
- Breitbart H. Intracellular calcium regulation in sperm capacitation and acrosomal reaction. *Mol Cell Endocrinol* **2002**; 22; 187:139-144.
- Brison DR, Schultz RM. Apoptosis during mouse blastocyst formation: evidence for a role for survival factors including transforming growth factor alpha. *Biol Reprod* **1997**; 56:1088-1096.
- Brower PT, Gizang E, Boreen SM, Schultz RM. Biochemical studies of mammalian oogenesis: synthesis and stability of various classes of RNA during growth of the mouse oocyte *in vitro*. *Dev Biol* **1981**; 86:373-383.
- Brun B. Studies on fertilization in *Xenopus laevis*. *Biol. Reprod.* **1974**; 11: 513-518.
- Cameron RDA, Durack M, Fogarty R, Putra DKH y McVeigh J. Practical experience with commercial embryo transfer in pigs. *Aust Vet J* **1990**; 66:314-318.
- Canipari R. Cell-cell interactions and oocyte growth. *Zygote* **1994**; 2:343-345.
- Carbonneau G, Sirard MA. Influence of follicular wall on meiotic resumption of bovine oocytes when cultured inside or outside hemisection. *J Reprod Dev* **1994**; 40:120-132.
- Catt JW, Rhodes SL. Comparative intracytoplasmic sperm injection (ICSI) in human and domestic species. *Reprod Fertil Dev* **1995**; 7:161-166.
- Catt JW. Intracytoplasmic sperm injection (ICSI) and related technology. *Anim Reprod Science* **1996**, 42: 239-250.
- Catt JW, O'Brien JK y Evans G. Microinjection of sperm into porcine oocytes: does an influx of calcium promote fertilization events?. *J Repro Fert* **1997**; 19:50 (Abstract).
- Chang MC. Fertilizability of rabbit ova and the effects of temperature *in vitro* on their subsequent fertilization and activation *in vivo*. *J Exp Zool* **1952**; 121:351-381.
- Chen WY, Yang JG, Li PS. Effect of dexamethasone on the expression of p34(cdc2) and cyclin B1 in pig oocytes *in vitro*. *Mol Reprod Dev* **2000**, 56:74-79.
- Cohen J, Alikani M, Trowbridge J, Rosenwaks Z. Implantation enhancement by selective assisted hatching using zona drilling of human embryos with poor prognosis. *Hum Reprod* **1992**; 7:685-691.
- Coskum S, Lin YC. Site of action of epidermal growth factor (EGF) on *in vitro* porcine oocyte maturation in chemically defined medium. *Biol Reprod* **1992**; 46:138 (Abstract).
- Coy P, Martinez E, Ruiz S, Vázquez JM, Roca J, Matás C. Sperm concentration influences fertilization and male pronuclear formation *in vitro* in pigs. *Theriogenology* **1993a**; 40:539-546.

- Coy P, Martínez E, Ruiz S, Vázquez JM, Roca J, Matás C, Pellicer MT. *In vitro* fertilization of pig oocytes alter different coincubation intervals. *Theriogenology* **1993b**; 39:1201-1208.
- Coy P, Martínez E, Ruiz S, Vazquez JM, Roca J, Gadea J. Environment and medium volume influence *in vitro* fertilisation of pig oocytes. *Zygote* **1993c** ; 1:209-213.
- Coy P, Ruiz s, Ouhibi n, Funahashi h, Day BN, Moor RM. Factors affecting nuclear and cytoplasmic maturation in pig oocytes. *Bio Reprod* **1996**; 54:159 (abstract).
- Coy P, Ruiz S, Romar R, Campos I, Gadea J. Maturation, fertilization and complete development of porcine oocytes matured under different systems. *Theriogenology* **1999**; 51:799-812.
- Coy P, Romar R, Ruiz S, Gadea J, Matás C, Sellés E. The effect of *in vitro* fertilization medium on the acrosome reaction, cortical reaction, zona pellucida hardening, and *in vitro* development in the pig. *Reproduction* **2002**; 124: 278-288.
- Coy P, Romar R. In vitro production of pig embryos. A point of view. *Reprod Fert Dev* **2002**; 14:275-286.
- Coy P, Canovas S, García E, Ruiz S, Gadea J, Matás C, Romar R. Effect of roscovitine, a cyclin-dependent kinases inhibitor, on pig *in vitro* maturation and fertilization by ICSI. *Human Reprod* **2003**; 18:37 (abstract).
- Coy P, Cánovas S, Ruiz S, Matás C, Gadea J, García E, Sansegundo M, García F, Gumbao D, Romar R. First pregnancies after transferring of *in vitro* produced pig embryos pre-cultured with roscovitine. *Human Reprod* **2004**; 19:41-42 (abstract).
- Coy P, Romar R, Ruiz S, Canovas S, Gadea J, Garcia FA, Matás C. Birth of piglets after transferring of in vitro produced embryos pre-cultured with roscovitine. *Reproduction* **2005**. En prensa.
- Christmann L, Jung T, Moor RM. MPF components and meiotic competence in growing pig oocytes. *Mol Reprod Dev* **1994**; 38:85-90.
- Cran DG, Cheng WTK. The cortical reaction in pig oocytes during *in vivo* and *in vitro* fertilization. *Gamete Res* **1986**; 13:241-251.
- Cuaniscú PS, Ellerman DA, Cohen DJ, Busso D, Morgenfeld MM, Da Ros VG. Molecular mechanisms involved in mamalian gamete fusion. *Arch Med Res* **2001**; 32:614-618.
- Daen FP, Sato E, Naito K, Toyoda Y. The effect of pig follicular fluid fractions on cumulus expansion and male pronucleus formation in porcine oocytes matured and fertilized *in vitro*. *J Reprod Fert* **1994**; 101:667-673.
- Daguet MC. In vivo change in the germinal vesicle of the sow oocyte during the follicular phase before the ovulatory LH surge. *Reprod Nutr Dev* **1980**; 20:673-680.
- Dantzer V. Electron microscopy of the initial stages of placentation in the pig. *Anat Embryol* **1985**; 172:281-293.
- Davis DL. Culture and storage of pig embryos. *J Reprod Fertil Suppl* **1985**; 33:115-124.
- Dekel N, Kraizer PF. Induction *in vitro* of mucification of rat cumulus oophorus by gonadotropins and adenosine 3',5'-monophosphate. *Endocrinology* **1978**; 57:1420-1425.

- Dekel, N. Meiotic cell cycle, oocytes. In: Encyclopedia of Reproduction. Ed: E. Knobil and JD Neill. Academic Press, San Diego, USA, **1999**; Vol 3: 168-176.
- Di Berardino D, Gil MA, Parrilla I, Fernandez MA, Coppola G, Mazza MR, Roca J, Vazquez JM, Lucas X, Martinez EA. Pronuclear Formation and embryo development in pig oocytes fertilized by intracytoplasmic sperm injection. *Theriogenology* **2000**; 389 (Abstract).
- Ding J, Moor RM, Foxcroft GR. Effects of protein synthesis on maturation, sperm penetration, and pronuclear development in porcine oocytes. *Mol Reprod Dev* **1992**; 33:59-66.
- Dobrinsky JR, Johnson LA, Rath D. Development of a culture medium (BECM-3) for porcine embryos: effects of bovine serum albumin and fetal bovine serum on embryo development. *Biol Reprod* **1996**; 55:1069-1074.
- Dozortsev D, Rybouchkin A, De Sutter P. Sperm plasma membrane damage prior to intracytoplasmic sperm injection: a necessary condition for sperm nucleus decondensation. *Human Reprod* **1995b**; 10: 2960-2964.
- Driancourt MA, Thuel B. Control of oocyte growth and maturation by follicular cells and molecules present in follicular fluid. *Reprod Nutr Dev* **1998**; 38:345-362.
- Dziuk P. Effect of migration, distribution and spacing of pig embryos on pregnancy and fetal survival *Journal of Reproduction and Fertility* **1985**; 33: 57-63.
- Ehrenwald E, Foote RH, Parks JE. Bovine oviductal fluid components and their potential role in sperm cholesterol efflux. *Mol Reprod Dev* **1990**; 25:195-204.
- Ellicot AR, Dziuk PJ, Polge C (1973) Maintenance of pregnancy in prepubertal gilts *Journal of Animal Science* **1973**; 37:971-973.
- Eng LA, Kornegay ET, Huntington J, Wellman T. Effects of incubation temperature and bicarbonate on maturation of pig oocytes *in vitro*. *J Reprod Fertil* **1986**; 76:657-662.
- Eppig JJ. Gonadotropin stimulation of the expansion of cumulus oophori isolated from mice: general conditions for expansion *in vitro*. *J Exp Zool* **1979**; 208:111-120.
- Eppig J. oocyte control of ovarian follicular development and function in mammals. *Reproduction* **2001**; 122:829-838.
- Eppig JJ, Downs SM. Chemical signals that regulate mammalian oocyte maturation. *Biol Reprod* **1984**; 30:1-11
- Espey LL. Ovulation. In: Encyclopedia of Reproduction. Ed: E. Knobil and JD. Neill. Academic press, San Diego, USA, **1999**; 3: 605-614.
- Exley GE, Carol MW. Zygotic Genomic Activation. In: Encyclopedia of Reproduction. Ed: E. Knobil and JD. Neill. Academic Press, San Diego, USA, **1999**; 4: 1041-1046.
- Fan HY, Tong C, Lian L, Li SW, Gao WX, Cheng Y, Chen DY, Schatten H, Sun QY. Characterization of ribosomal S6 protein kinase p90rsk during meiotic maturation and fertilization in pig oocytes: mitogen-activated protein kinase-associated activation and localization. *Biol Reprod* **2003**; 68:968-977.
- Flint APF. An unifying hypothesis for the control of blastocyst growth based on observations on the pig. *J Reprod Fert* **1981**; 29:215-227.

- Flowers WL, Esbenshade KL. Optimizing management of natural and artificial matings in swine. *J Reprod Fertil Suppl* **1993**; 48:217-228.
- Foulady Nashta AA, Waddington D, Campbell KHS. Maintenance of bovine oocytes in meiotic arrest and subsequent development *in vitro*: a comparative evaluation of antral follicle culture with other methods. *Mol Reprod Dev* **1998**; 59:255-262.
- Frank M, Bazer FW, Thatcher WW, Wilcox CJ. A study of prostaglandin F2alpha as the luteolysin in swine: III effects of estradiol valerate on prostaglandin F, progestins, estrone and estradiol concentrations in the utero-ovarian vein of nonpregnant gilts. *Prostaglandins* **1977**; 14:1183-1196.
- Freitag M, Dopke HH, Niemman H, Elsaesser F. Ontogeny of RNA synthesis in preimplantation pig embryos and the effect of antioestrogen on blastocyst formation *in vitro*. *J Reprod Fert* **1988**; 1:11 (abstract).
- Fukui Y, Glew AM, Gandolfi F, Moor RM. *In vitro* culture of sheep oocytes matured and fertilized *in vitro*. *Theriogenology* **1988**; 29:883-891.
- Fulka J Jr, Motlik J, Fulka J, Crozet N. Activity of maturation promoting factor in mammalian oocytes after its dilution by single and multiple fusions. *Dev Biol* **1986**; 118:176-181.
- Fulka J Jr, First NL, Moor RM. Nuclear and cytoplasmic determinants involved in the regulation of mammalian oocyte maturation. *Mol Hum Reprod* **1998**; 4:41-49.
- Funahashi H, Day BN. Effects of follicular fluid at fertilization *in vitro* on sperm penetration in pig oocytes. *J Reprod Fertil* **1993**; 99:97-103.
- Funahashi H, Cantley TC, Day BN. Different hormonal requirements of pig oocyte-cumulus complexes during maturation *in vitro*. *J Reprod Fert* **1994a**; 101:159-165.
- Funahashi H, Cantley TC, Stumpf TT, Terlouw SL, Day BN. Use of low-salt culture medium for *in vitro* maturation of porcine oocytes is associated with elevated oocyte glutathione levels and enhanced male pronuclear formation after *in vitro* fertilization. *Biol Reprod* **1994b**; 51:633-639.
- Funahashi H, Cantley TC, Day BN. Synchronization of meiosis in porcine oocytes by exposure to dibutyl cyclic AMP improves developmental competence following *in vitro* fertilization. *Biol Reprod* **1997a**; 57:49-53.
- Funahashi H, Day BN. Advances in *in vitro* production of pig embryos. *J Reprod Fert* **1997b**; 52:271-283.
- Funahashi H, Nagai T. Regulation of *in vitro* penetration of frozen-thawed boar spermatozoa by caffeine and adenosine. *Mol Reprod Dev* **2001**; 58:424-431.
- Funahashi, H. Polyspermic penetration in porcine IVM-IVF systems. *Reprod Fertil Dev*. **2003**;15:167-77.
- Gaddum-Rosse P. Mammalian gamete interactions: what can be gained from observations on living eggs? *Am J Anat* **1985**; 174:347-356.
- Galeati G, Modina S, Lauria A, Mattioli M. Follicle somatic cells influence pig oocyte penetrability and cortical granule distribution. *Mol Reprod Dev* **1991**; 29:40-46.

- Gandolfi F, Moor RM. Stimulation of early embryonic development in the sheep by coculture with oviduct epithelial cells. *J Reprod fert* **1987**; 81:23-28.
- García E, Coy P, Matás C, Gadea J, Ruiz S, Romar R. Intracytoplasmic sperm injection of porcine oocytes with two different *in vitro* capacitation systems *Theriogenology* **2003**; 59:315 (abstract).
- García-Roselló E. Efecto del tratamiento espermático sobre el rendimiento de la inyección intracitoplasmática de espermatozoides (ICSI) en la especie porcina. Tesis de Licenciatura **2003**. Universidad de Murcia.
- Gardner DK, Lane M, Spitzer A, Batt PA. Enhanced rates of cleavage and development for sheep zygotes cultured to the blastocyst stage *in vitro* in the absence of serum and somatic cells: amino acids, vitamins, and culturing embryos in groups stimulate development. *Biol Reprod* **1994**; 50:390-400.
- Geisert RD, Zavy MT, Moffatt RJ, Blair RM, Yellin T. Embryonic steroids and the establishment of pregnancy in pigs. *J Reprod Fertil Suppl* **1990**;40:293-305.
- Geisert RD. Pigs. In: *Encyclopedia of Reproduction*. Ed: E. Knobil and JD. Neill. Academic Press, San Diego, USA, **1999**; 3:792-799.
- Gilula NB, Epstein ML, Beers WH. Cell-to-cell communication and ovulation. A study of the cumulus-oocyte complex. *J Cell Biol* **1978**; 78:58-75.
- Goto K, Kinoshita, Takuma, Ogawa K. Fertilization of bovine oocytes by the injection of immobilised, killed spermatozoa. *Vet Record* **1990**; 127: 517-520.
- Gougeon A. Regulation of ovarian follicular development in primates: facts and hypotheses. *Endocr Rev* **1996**; 17:121-155.
- Green DPL. Three dimensional structure of the zona pellucida. *Rev Reprod* **1997**; 2:147-156.
- Grimes RW, Ireland JJ. Relationship of macroscopic appearance of the surface of bovine ovarian follicles concentrations of steroids in follicular fluid, and maturation of oocytes *in vitro*. *Biol Reprod* **1986**; 35:725-732.
- Grondahl C, Hansen TH, Hossaini A, Heinze I, Greve T, Hyttel P. Intracytoplasmic sperm injection of *in vitro*-matured equine oocytes. *Biol Reprod* **1997**; 57:1495-1501.
- Guerin P, Guillaud J, Menezo Y. Hypotaourine in spermatozoa and genital secretions and its production by oviduct epithelial cells *in vitro*. *Hum Reprod* **1995**; 10:866-872.
- Hafez ESE. Fecundación y segmentación. En Hafez ESE (ed.), *reproducción e inseminación artificial en animales*, 7º ed. México: Interamericana.MC Graw-Hill **2000**; 8:113-127.
- Hajdu MA, Knight JW, Canseco RS, Krisher RL, Velander WH, Pearson RE, Gwazdauskas FC. Effect of culture conditions, donor age, and injection site on *in vitro* development of DNA microinjected porcine zygotes. *J Anim Sci* **1994**; 72:1299-1305.
- Harper MJK. Gamete and Zygote transport. En: Knobbil E, Neill JD (eds.), *The Physiology of Reproduction*. New York: Raven press; **1988**:103-126.
- Hazeleger W, Bouwman EG, Noordhuizen JPTM, Kemp B. Effect of superovulation induction on embryonic development on Day 5 and subsequent development and survival after nonsurgical embryo transfer. *Theriogenology* **2000**; 53:1063-1070.

- Hedrick JL, Wardrip NJ, Berger T. Differences in the macromolecular composition of the zona pellucida isolated from pig oocytes, eggs, and zygotes. *J Exp Zool* **1987**; 241:257-262.
- Heinlein UAO, Wallat S, Senftleben A, Lemaire L. Male germ cell- expressed mouse gene TAZ83 encodes a putative, cysteine-rich transmembrane protein (cyritestin) sharing homologies with snake toxins and sperm-egg fusion proteins. *Dev Growth Diff* **1994**; 36: 49-55.
- Hendriksen PJM, Vos PLAM, Steenweg WNM, Bevers MM, Dieleman SJ. Bovine follicular development and its effect on the *in vitro* competence of oocytes. *Theriogenology* **2000**; 53:11-20.
- Hiramoto Y. Microinjection of the live spermatozoa into sea urchin eggs. *Exp. Cell Res.* **1962**, 27: 416-426.
- Hlinka D, Herman M, Vesela J, Hredzak R, Horvath S, Pacin J. A modified method of intracytoplasmic sperm injection without the use of polyvinylpyrrolidone. *Hum Reprod* **1998**; 13:1922-1927.
- Holm P, Callesen H. *In vivo* versus *in vitro* produced bovine ova: similarities and differences relevant for practical application. *Reprod Nutr Dev* **1998**; 38:579-594.
- Hunter MG. Oocyte maturation and ovum quality in pigs. *Reviews of Reproduction* **2000**; 5:122-130.
- Hunter RHF. Porcine ovulation after injection of human chorionic gonadotrophin. *Vet Rec* **1967**; 81:21-23.
- Hunter RHF. Chronological and cytological details of fertilization and early embryonic development in the domestic pig. *Sus scrofa*. *Anat Rec* **1974**; 178:169-186.
- Hunter RHF. Técnicas para la maduración *in vitro* de gametos, la fecundación *in vitro*, el cultivo de embriones y el almacenamiento a largo plazo. En: Hunter RHF (ed), *Fisiología y tecnología de la reproducción de la hembra de los animales domésticos*, 1ª ed. Acribia, España, **1982**, pp 215-241.
- Hunter RHF. The fallopian tube. Their role in fertility. Berlin: Springer-verlag; **1988**.
- Hunter RHF. Ovarian programming of gamete progression and maturation in the female genital tract. *Zoological Journal of the linnean society* **1989**; 95:117-124.
- Hunter RHF. Oviduct function in pigs, with particular refernce to the pathological condiction of polyspermy. *Mol Reprod Dev* **1991**; 29:385-391.
- Hunter RHF. Polyspermy. In: *Encyclopedia of Reproduction*. Ed: E. Knobil and JD. Neill. Academic Press, San Diego, USA, **1999**; 3: 930-937.
- Hyttel P, Fair T, Callesen H, Greve T. Oocyte growth capacitation and final maturation in cattle. *Theriogenology* **1997**; 47:23-32.
- Inoue M, Naito K, Aoki F, Toyoda Y, Sato E. Activation of mitogen-activated protein kinase during meiotic maturation in porcine oocytes. *Zygote* **1995**; 3:265-271.
- Iritani A, Hosoi Y, Torii R. Application of ICSI in domestic and/or zoo animals. *Gamet Dev Funct, Serono Symposia* **1998**; 393-404.

- Iwasaki T, Kimura E, Totsukawa K. Studies on a chemically defined medium for *in vitro* culture of *in vitro* matured and fertilized porcine oocytes. *Theriogenology* **1999**; 51:709-720.
- Jewgenow K, Heerdegen B, Muller K. *In vitro* development of individually matured bovine oocytes in relation to follicular wall atresia. *Theriogenology* **1999**; 51:745-756.
- Jimenez A, Madrid-Bury N, Fernandez R, Perez-Garnelo S, Moreira P, Pintado B, de la Fuente J, Gutierrez-Adan A. Hyperglycemia-induced apoptosis affects sex ratio of bovine and murine preimplantation embryos. *Mol Reprod Dev* **2003**; 65: 180-187.
- Jones KT, Cruttwell C, Parrington J, Swann K. A mammalian sperm cytosolic phospholipase C activity generates inositol trisphosphate and causes Ca<sup>2+</sup> release in sea urchin egg homogenates. *FEBS Lett.* **1998**; 437:297-300.
- Joris H, Nagy Z, Van De Velde H, De Vos A, Van Steirteghem A. Intracytoplasmic sperm injection: laboratory set-up and injection procedure. *Hum Reprod* **1998**; 1: 76-86.
- Ju JC, Tsay C, Ruan CW. Alterations and reversibility in the chromatin, cytoskeleton and development of pig oocytes treated with roscovitine. *Mol Reprod Dev* **2003**; 64:482-491.
- Ka HH, Sawai K, Wang WH, Im KS, Niwa K. Amino acids in maturation medium and presence of cumulus cells at fertilization promote male pronuclear formation in porcine oocytes matured and penetrated *in vitro*. *Biol Reprod* **1997**; 57:1478-1483.
- Kanayama N, Miyano T, Lee J. Acquisition of meiotic competence in growing pig oocytes correlates with their ability to activate Cdc2 kinase and MAP kinase. *Zygote* **2002**; 10:261-70.
- Kane MT. A review of *in vitro* gamete maturation and embryo culture and potential impact on future animal biotechnology. *Anim Reprod Sci* **2003**; 79:171-190.
- Kasai T, Hoshi K, Yanagimachi R. Effect of sperm immobilisation and demembration on the oocyte activation rate in the mouse. *Zygote* **1999**; 7:187-193.
- Kasinathan P, Knott JG, Spell AR, King TL, Robl JM. Effect of roscovitine delayed maturation on development of nuclear transplant embryos. *Theriogenology* **2001**; 55:1, 273 (Abstract).
- Katayama M, Miyano T, Miyake M, Kato S. Progesterone treatment of boar spermatozoa improves male pronuclear formation after intracytoplasmic sperm injection into porcine oocytes. *Zygote* **2002a**; 10: 95-104.
- Katayama M, Koshida M, Miyake M. Fate of the acrosome in ooplasm in pigs after IVF and ICSI. *Hum Reprod* **2002b**; 17:2657-2664.
- Katska L, Rynska B, Smorag Z. Development competence of bovine IVM/IVF oocytes under different co-culture conditions. *J Anim Feed Sci* **1998**; 7:353-362.
- Katsuragawa H, Kanzaki H, Inoue T, Hirano T, Narukawa S, Watanabe H, Mori T. Endometrial stromal cell decidualization inhibits human chorionic gonadotrophin and human placental lactogen secretion by co-cultured trophoblasts. *Hum Reprod* **1995**; 10:3028-3034.
- Khatir H, Lonergan P, Mermillod P. Kinetics of nuclear maturation and protein profiles of oocytes from prepuberal and adult cattle during *in vitro* maturation. *Theriogenology* **1998**; 50:917-929.

- Kikuchi K, Nagai T, Motlik J, Shioya Y, Izake Y. Effect of follicle cells on *in vitro* fertilization of pig follicular oocytes. *Theriogenology* **1993**; 39:593-599.
- Kikuchi K, Kashiwazaki N, Noguchi J, Shimada A, Takahashi R, Hirabayashi M, Shino M, Ueda M, Kaneko H. Developmental competence, after transfer to recipients, of porcine oocytes matured, fertilized, and cultured *in vitro*. *Biol Reprod* **1999**; 60:336-340
- Kikuchi K, Naito K, Noguchi J, Shimada A, Kaneko H, Yamashita M, Aoki F, Tojo H, Toyoda Y. Maturation/M-phase promoting factor: a regulator of aging in porcine oocytes. *Biol Reprod* **2000**; 63:715-722.
- Kikuchi K, Onishi A, Kashiwazaki N, Iwamoto M, Noguchi J, Kaneko H, Akita T, Nagai T. Successful piglet production after transfer of blastocysts produced by a modified *in vitro* system. *Biol Reprod* **2002**;66:1033-1041.
- Kim HS, Lee GS, Hyun SH, Lee SH, Nam DH, Jeong YW, Kim S, Kang SK, Lee BC, Hwang WS. Improved *in vitro* development of porcine embryos with different energy substrates and serum. *Theriogenology* **2004**; 61:1381-1393.
- Kim NH, Lee JW, Jun SH, Lee HT, Chung KS. Fertilization of porcine oocytes following intracytoplasmic spermatozoon or isolated sperm head injection. *Mol Reprod Dev* **1998**; 51:436-444.
- Kim NH, Shin JS, Kim C, Jun SH, Lee HT, Chung KS. Fertilization and *in vitro* development of porcine oocytes following intracytoplasmic injection of round spermatid or round spermatid nuclei. *Theriogenology* **1999**; 51:1441-1449.
- Klocke S. ICSI of *in vivo* and *in vitro* matured porcine oocytes with epididymal spermatozoa and boar spermatozoa flowcytometrically sorted for gender. Thesis, Tieraerztl Hochsch Hannover. **1999**.
- Kolbe T, Holtz W. Intracytoplasmic injection (ICSI) of *in vivo* or *in vitro* matured oocytes with fresh ejaculated or frozen-thawed epididymal spermatozoa and additional calcium-ionophore activation in the pig. *Theriogenology* **1999**; 52: 671-682.
- Kolbe T, Holtz W. Birth of a piglet derived from an oocyte fertilized by intracytoplasmic sperm injection (ICSI). *Anim Reprod Science* **2000**; 64:97-101.
- Koo DB, Kim NH, Lee HT, Chung KS. Effects of fetal calf serum, amino acids, vitamins and insulin on blastocoel formation and hatching of *in vivo* and IVM/IVF-derived porcine embryos developing *in vitro*. *Theriogenology* **1997**; 48:791-802.
- Krischek C, Meinecke B. Roscovitine, a specific inhibitor of cyclin-dependent protein kinases, reversibly inhibits chromatin condensation during *in vitro* maturation of porcine oocytes. *Zygote*. **2001**; 9:309-316.
- Kubelka M, Motlik J, Fulka J, Prochazka R, Rimkevicova Z, Fulaka J. Time sequence of germinal vesicle breakdown in pig oocytes after cycloheximide and P-amino-benzamidine block. *Gamete Res* **1988**; 19:423-431.
- Kubelka M, Motlik J, Schultz RM, Pavlok A. Butyrolactone I reversibly inhibits meiotic maturation of bovine oocytes, Without influencing chromosome condensation activity. *Biol Reprod* **2000**; 62:292-302.

- Lacham-Kaplan O, Trounson A. Intracytoplasmic sperm injection in mice: increased fertilization and development to term after induction of the acrosome reaction. *Hum Reprod* **1995**; 10: 2642-2649.
- Lai L, Sun Q, Wu G, Murphy CN, Kuhholzer B, Park KW, Bonk AJ, Day BN, Prather RS. Development of porcine embryos and offspring after intracytoplasmic sperm injection with liposome transfected or non-transfected sperm into *in vitro* matured oocytes. *Zygote* **2001**; 9:339-346.
- Lane M, Gardner DK. Lactate regulates pyruvate uptake and metabolism in the preimplantation mouse embryo. *Biol Reprod* **2000**; 62:16-22.
- Larson MA, Kimura K, Kubisch HM, Roberts RM. Sexual dimorphism among bovine embryos in their ability to make the transition to expanded blastocyst and in the expression of the signaling molecule IFN-tau. *Proc Natl Acad Sci USA* **2001**; 14; 98(17):9677-9682.
- Latham KE, Garrels JI, Chang C, Solter D. Quantitative analysis of protein synthesis in mouse embryos. I. Extensive reprogramming at the one- and two-cell stages. *Development* **1991**; 112:921-932.
- Lee J, Miyano T, Dai Y, Wooding P, Yen TJ, Moor RM. Specific regulation of CENP-E and kinetochores during meiosis I/meiosis II transition in pig oocytes. *Mol Reprod Dev* **2000**; 56:51-62.
- Lee JW, Tian XC, Yang X. Failure of male pronucleus formation is the major cause of lack of fertilization and embryo development in pig oocytes subjected to intracytoplasmic sperm injection. *Biol Reprod* **2003**; 68:1341-1347.
- Lim JM, Okitsu O, Okuda K, Niwa K. Effects of fetal clan serum in cultura médium on development of bovine oocytes matured and fertilized *in vitro*. *Theriogenology* **1994**; 41:1091-1098.
- Liu L, Dai Y, Moor RM. Role of secreted proteins and gonadotrophins in promoting full maturation of porcine oocytes *in vitro*. *Mol Reprod Dev* **1997**; 47:191-199.
- Ljungman M, Paulsen MT. The cyclin-dependent Kinase inhibitor roscovitine inhibits RNA synthesis and triggers nuclear accumulation of p53 that is unmodified at Ser15 and Lys382. *Mol Pharmacol* **2001**; 60:785-789.
- Lonergan P, Khatir H, Carolan C, Mermillod P. Bovine blastocyst production *in vitro* after inhibition of oocyte meiotic resumption for 24h. *J Reprod Fert* **1997**; 109:355-365.
- Lonergan P, Khatir H, Piumi F, Rieger D, Humblot P, Boland MP. Effect of time interval from insemination to first cleavage on the developmental characteristics, sex and pregnancy rates following transfer of bovine preimplantation embryos. *J Reprod Fert* **1999**; 117:159-167.
- Lonergan P, Dinnyes A, Fair T, Yang X, Boland M. Bovine oocyte and embryo development following meiotic inhibition with butyrolactone I. *Mol Reprod Dev* **2000**; 57: 204-209.
- Lorca T, Cruzalegui FH, Fesquet D, Cavadore JC, Mery J, Means A, Doree M. Calmodulin-dependent protein kinase II mediates inactivation of MPF and CSF upon fertilization of *Xenopus* eggs. *Nature* **1993** ; 18; 366(6452):270-273.

- Lucy MC, Savio JD, Badinga L, De La Sota RL, Thatcher WW. Factors that affect ovarian follicular dynamics in cattle. *J. Anim Sci* **1992**; 70: 3614-3626.
- Machaty Z, Day BN, Prather RS. Development of early porcine embryos *in vitro* and *in vivo*. *Biol Reprod* **1998**; 59:451-455.
- McGaughey RW, Montgomery DH, Richter JD. Germinal vesicle configurations and patterns of polypeptide synthesis of porcine oocytes from antral follicles of different size, as related to their competency for spontaneous maturation. *J Exp Zool* **1979**; 209:239-254..
- Marchal R, Vigneron C, Perreau C, Bali-Papp A, Mermillod P. Effect of follicular size on meiotic and developmental competence of porcine oocytes. *Theriogenology* **2002**; 57:1523-1532.
- Markert CL. Fertilization of mammalian eggs by sperm injection. *J Exp Zool* **1983**; 228:195-201.
- Markström E, Svensson EC, Shao R, Svanberg B, Billig H. Survival factors regulating ovarian apoptosis-dependence on follicle differentiation. *Reproduction* **2002**; 123:23-30.
- Martin MJ. Development of *in vivo* matured porcine oocytes following intracytoplasmic sperm injection. *Biol Reprod* **2000**; 63:109-112.
- Martínez B. Estudio de fecundación *in vitro* en porcino: reducción de lapolispermia y optimización de la producción *in vitro* de embriones. Tesis Doctoral **2002**. Universidad Complutense de Madrid.
- Martínez E, Vázquez JM, Matás C, Roca J, Coy P, Gadea J. Evaluation of boar spermatozoa penetrating capacity using pig oocytes at the germinal vesicle stage. *Theriogenology* **1993**; 40:547-557.
- Martinez EA, Caamano JN, Gil MA, Rieke A, McCauley TC, Cantley TC, Vazquez JM, Roca J, Vazquez JL, Didion BA, Murphy CN, Prather RS, Day BN. Successful nonsurgical deep uterine embryo transfer in pigs. *Theriogenology* **2004**; 61:137-146.
- Masui Y, Market CL. Cytoplasmic control of nuclear behavior during meiotic maturation of frog oocytes. *J Exp Zool* **1971**; 177:129-146.
- Matas C, Coy P, Romar R, Marco M, Gadea J, Ruiz S. Effect of sperm preparation method on *in vitro* fertilization in pigs. *Reproduction* **2003**;125:133-141.
- Mattioli M, Galeati G, Seren E. Effect of follicle somatic cells during pig oocyte maturation on egg penetrability and male pronucleus formation. *Gamete Res* **1988**; 20:177-183.
- Mattioli M. Recent acquisitions in pig oocyte maturation and fertilization *in vitro*. *Reprod Dom Anim* **1994**; 29:347-349.
- McClue SJ, Blake D, Clarke R, Cowan A, Cummings L, Fischer PM, MacKenzie M, Melville J, Stewart K, Wang S, Zhelev N, Zheleva D, Lane DP. In vitro and in vivo antitumor properties of the cyclin dependent kinase inhibitor CYC202 (R-roscovitine). *Int J Cancer* **2002**; 102:463-468.
- McGaughey RW, Montgomery DH, Richter JD. Germinal vesicle configurations and patterns of polypeptide synthesis of porcine oocytes from antral follicles of different size, as related to their competency for spontaneous maturation. *J Exp Zool* **1979**; 209:239-254.
- McGee EA, Hsueh AJ. Initial and cyclic recruitment of ovarian follicles. *Endocr Rev* **2000**; 21: 200-214.

- McNatty KP, Heath DA, Lundy T, Fidler AE, Quirke L, O'Connell A, Smith P, Groome N, Tisdall DJ. Control of early ovarian follicular development. *J Reprod Fertil Suppl* **1999**; 54:3-16.
- Meijer L, Raymond E. Roscovitine and other purines as kinase inhibitors. From starfish oocytes to clinical trials. *Acc Chem Res* **2003**; 36:417-425.
- Meister A, Anderson ME. Glutathione. *An Rev Bioch* **1983**; 52:711-760.
- Mermillod P, Oussaid B, Cognie Y. Aspects of follicular and oocyte maturation that affect the developmental potential of embryos. *J Reprod Fertil Suppl* **1999**; 54:449-60.
- Mermillod P, Tomanek M, Marchal R, Meijer L. High developmental competence of cattle oocytes maintained at the germinal vesicle stage for 24 hours in culture by specific inhibition of MPF kinase activity. *Mol Reprod Dev* **2000**; 55:89-95.
- Mertineit C, Yoder JA, Taketo T, Laird DW, Trasler JM, Bestor TH. Sex-specific exons control DNA methyltransferase in mammalian germ cells. *Development* **1998**; 125:889-897.
- Miller DJ. A sperm's perspective of fertilization. *Proceedings of the American Society of animal Science* **1999**.
- Miyano T, Dai Y, Lee J, Kano K, Moor RM. Degradation of pig cyclin B1 molecules precedes MAP kinase dephosphorylation during fertilisation of the oocytes. *Zygote* **2000**; 8:153-158.
- Miyazaki S, Shirakawa H, Nakada K, Honda Y. Essential role of the inositol 1,4,5-trisphosphate receptor/Ca<sup>2+</sup> release channel in Ca<sup>2+</sup> waves and Ca<sup>2+</sup> oscillations at fertilization of mammalian eggs. *Dev Biol* **1993**; 158:62-78.
- Moor RM, Mattioli M, Ding J, Nagai T. Maturation of pig oocytes *in vivo* and *in vitro*. *J Reprod fert* **1990**; 40:197-210.
- Moor RM, Dai y, Lee C, Fulka J, Jr. Oocyte maturation and embryonic failure. *Hum Reprod update* **1998**; 3:223-236.
- Moore HDM, Bedford JM. The interaction of mammalian gametes in the female. In: *Mechanism and control of Animal fertilization*. Ed: Hartmann JF. Academic press, New York, USA, **1983**; 453-497.
- Moos J, Visconti PE, Moore GD, Schultz RM, Kopf GS. Potential role of mitogen-activated protein kinase in pronuclear envelope assembly and disassembly following fertilization of mouse eggs. *Biol Reprod* **1995**; 53:692-699.
- Morbeck DE, Esbenshade KL, Flowers WL, Britt JH. Kinetics of follicle growth in the prepurebal gilt. *Biol Reprod* **1992**; 47:485-491.
- Mori T, Amano T, Shimizu H. Roles of gap junctional communication of cumulus cell in cytoplasmic maturation of porcine oocytes cultured *in vitro*. *Biol Reprod* **2000**; 62:913-919.
- Motlik J, Crozet N, Fulka J. Meiotic competence *in vitro* of pig oocytes isolated from early antral follicles. *J Reprod Fert* **1984**; 72:323-328.
- Motlik J, Fulka J. Factors affecting meiotic competente in pig oocytes. *Theriogenology* **1986**; 25:87-97.
- Motlik J, Kubelka M. Cell-cycle aspects of growth and maturation of mammalian oocytes. *Mol Reprod Dev* **1990**; 27:366-375.

- Motlik J, Pavlok A, Lapathitis G. Impact of two-step *in vitro* culture systems on developmental potency of oocytes. *Reprod Dom Anim* **2000**; 35:267-271.
- Myles DG, Primakoff P. Why did the sperm cross the cumulus? To get to the oocyte. Functions of the sperm surface proteins PH-20 and fertilin in arriving at, and fusing with, the egg. *Biol Reprod* **1997**; 56:320-327.
- Miyazaki S, Shirakawa H, Nakada K, Honda Y. Essential role of the inositol 1,4,5-trisphosphate receptor/Ca<sup>2+</sup> release channel in Ca<sup>2+</sup> waves and Ca<sup>2+</sup> oscillations at fertilization of mammalian eggs. *Dev Biol* **1993**; 158:62-78.
- Nagai T, Takahashi T, Masuda H, Shioya Y, Kuwayama M, Fukushima M, Iwasaki S, Hanada A. In-vitro fertilization of pig oocytes by frozen boar spermatozoa. *J Reprod Fertil* **1988**; 84:585-591.
- Nagai T, Moor RM. Effect of oviduct cells on the incidence of polyspermy in pig eggs fertilized *in vitro*. *Mol Reprod Dev* **1990**; 26:377-382.
- Nagashima H, Fujimura T, Takahagi Y, Kurome M, Wako N, Ochiai T, Esaki R, Kano K, Saito S, Okabe M, Murakami H. Development of efficient strategies for the production of genetically modified pigs. *Theriogenology* **2003**, 59:95-106.
- Nagy Zp, Liu J, Joris H, Wisanto A, Devroey P, Van Steirteghem AC. The influence of the site of sperm deposition and mode of oolemma breakage at intracytoplasmic sperm injection (ICSI) on fertilization and embryo development rates. IXth World congress on *in vitro* fertilization and alternate assisted reproduction, Vienna. *Journal of Assisted Reprod and genetics* **1995**; 12:6.
- Naito K, Fukuda Y, Toyoda Y. Effects of porcine follicular fluid on male pronucleus formation in porcine oocytes matured *in vitro*. *Gamete Res* **1988**; 21:289-295.
- Nakai M, Kashiwazaki N, Takizawa A, Hayashi Y, Nakatsukasa E, Fuchimoto D, Noguchi J, Kaneko H, Shino M, Kikuchi K. Viable piglets generated from porcine oocytes matured *in vitro* and fertilized by intracytoplasmic sperm head injection. *Biol Reprod* **2003**; 68:1003-1008.
- Nath KA, Enright H, Nutter L, Fischereder M, Zou JN, Hebbel RP. Effect of pyruvate on oxidant injury to isolated and cellular DNA. *Kidney Int* **1994**;45:166-176.
- Niemann H, Illera MJ, Dziuk PJ. Developmental capacity, size and number of nuclei in pig embryos cultured *in vitro*. *Anim Reprod Sci* **1983**; 5:311-322.
- Niemann H, Rath D. Progress in reproductive biotechnology in swine. *Theriogenology* **2001**; 56:1291-1304.
- O'Brien JK, Catt JW, Maxwell WMC, Evans G. Intracytoplasmic injection (ICSI) of *in vitro* matured pig oocytes with unsorted and sex-sorted pig spermatozoa. 13th ICAR Congress. Sydney (Australia) P10-20. **1996**.
- Oktay K, Briggs D, Gosden RG. Ontogeny of follicle-stimulating hormone receptor gene expression in isolated human ovarian follicles. *J Clin Endocrinol Metab* **1997**; 82:3748-3751.

- O'Neill C. Autocrine mediators are required to act on the embryo by the 2-cell stage to promote normal development and survival of mouse preimplantation embryos *in vitro*. *Biol Reprod* **1998**;58:1303-1309.
- Papaioannou VE, Ebert KM. The preimplantation pig embryo: cell number and allocation to trophectoderm and inner cell mass of the blastocyst *in vivo* and *in vitro*. *Development* **1988**; 102:793-803.
- Parrington J, Swann K, Shevchenko VI, Sesay AK, Lai FA. Calcium oscillations in mammalian eggs triggered by a soluble sperm protein. *Nature* **1996**; 25;379(6563):364-368.
- Parrington J, Jones ML, Tunwell R, Devader C, Katan M, Swann K. Phospholipase C isoforms in mammalian spermatozoa: potential components of the sperm factor that causes Ca<sup>2+</sup> release in eggs. *Reproduction* **2002**; 123:31-39.
- Perry AC, Wakayama T, Cooke IM, Yanagimachi R. Mammalian oocyte activation by the synergistic action of discrete sperm head components: induction of calcium transients and involvement of proteolysis. *Dev Biol* **2000**; 15;217:386-393.
- Petters RM, Wells KD. Culture of pig embryos. *J Reprod Fertil Suppl* **1993**; 48:61-73.
- Philpott CC, Ringuette MJ, Dean J. Oocyte-specific expression and developmental regulation of ZP3, the sperm receptor of the mouse zona pellucida. *Dev Biol* **1987**; 21:568-575.
- Picton HM, Briggs D, Gosden R. The molecular basis of oocyte growth and development. *Mol and Cel End* **1998**; 145:27-37.
- Picton HM. Activation of follicle development: the primordial follicle. *Theriogenology* **2001**; 55:1193-1210.
- Picton HM, Danfour MA, Harris SE, Chambers EL, Huntriss J. Growth and maturation of oocytes *in vitro*. *Reprod Suppl* **2003**; 61:445-462.
- Polanski Z, Zubiak JZ. Meiosis. In: *Encyclopedia of Reproduction*. Ed: E. Knobil and JD. Neill. Academic Press, San Diego, **1999**; 3:160-167.
- Polge C. Fertilization in the pig and horse. *J Reprod Fertil*. **1978**; 54:461-470.
- Ponderato N, Lagutina I, Crotti G, Turini P, Galli C, Lazzari G. Bovine oocytes treated prior to *in vitro* maturation with a combination of butyrolactone I and roscovitine at low doses maintain a normal developmental capacity. *Mol Reprod Dev* **2001**; 60:579-585.
- Pope CE, Johnson CA, Mcrae MA, Keller GI, Dresser BI. Development of embryos produced by intracytoplasmic sperm injection of cat oocytes. *Anim Reprod Sci* **1998**; 53:221-36.
- Primakoff P, Myles DG. Penetration, adhesion, and fusion in mammalian sperm-egg interaction. *Science* **2002**; 21;296(5576):2183-2185.
- Probst S, Rath D. Piglets are born after intracytoplasmic sperm injection (ICSI) with flowcytometrically sorted semen. *Theriogenology* **2003**; 59: 961-973
- Prochazka R, Nagyova E, Brem G, Schellander K, Motlik J. Secretion of cumulus expansion-enabling factor (CEEf) in porcine follicles. *Mol Reprod Dev* **1998**; 49:141-149.
- Rath D, Long CR, Dobrinsky JR, Welch GR, Schreier LL, Johnson LA. *In vitro* production of sexed embryos for gender preselection: high-speed sorting of X-chromosome-bearing sperm to produce pigs after embryo transfer. *J Anim Sci* **1999**; 77:3346-3352.

- Rath D, Niemann H, Tao T. *In vitro* maturation of porcine oocytes in follicular fluid with subsequent effects on fertilization and embryo yield *in vitro*. *Theriogenology* **1995**; 44:529-538.
- Rath D, Niemann H, Torres CRL. *In vitro* development to blastocysts of early porcine embryos produced *in vivo* or *in vitro*. *Theriogenology* **1995**; 43:913-926.
- Rath D, Niemann H. *In vitro* fertilization of porcine oocytes with fresh and frozen-thawed epididymal semen obtained from identical boars. *Theriogenology* **1997**; 47:785-793.
- Rho GJ, Kawarsky S, Johnson WH, Kochhar K, Betteridge KJ. Sperm and oocyte treatments to improve the formation of male and female pronuclei and subsequent development following intracytoplasmic sperm injection into bovine oocytes. *Biol Reprod* **1998**; 59:918-24.
- Richard FJ, Sirard MA. Effect of follicular cells on oocyte maturation.II. Theca cells inhibition of bovine oocyte maturation *in vitro*. *Biol Reprod* **1996**; 54:22-28.
- Ringuette MJ, Chamberlin ME, Baur AW, Sobieski DA, Dean J. Molecular analysis of cDNA coding for ZP3, a sperm binding protein of the mouse zona pellucida. *Dev Biol* **1988**; 127:287-295.
- Rizos D, Gutiérrez-Adán A, Perez S, De la Fuente J, Boland MP, Lonergan P. Bovine embryo culture in the presence or absence of serum: implications for blastocyst development, cryotolerance, and Messenger RNA expression. *Biology of Reproduction* **2003**; 68: 236-243.
- Rodriguez KF, Farin CE. Gene transcription and regulation of oocyte maturation. *Reprod Fertil Dev* **2004**;16:55-67.
- Romar R. Efecto de las células oviductales y del *cumulus oophorus* sobre diferentes parámetros biológicos relacionados con la fecundación *in vitro* en la especie porcina. **Tesis Doctoral**. I.S.B.N.: 84-8371-366-7. Universidad de Murcia. Servicio de Publicaciones. D. L. MU-236-2003. **2003**.
- Romar R, Coy P, Campos I, Gadea J, Matas C, Ruiz S. Effect of co-culture of porcine sperm and oocytes with porcine oviductal epithelial cells on *in vitro* fertilization. *Anim Reprod Sci* **2001**; 68:85-98.
- Saeki k, Nagao Y, Kishi M, Nagai M. developmental capacity of bovine oocytes following inhibition of meiotic resumption by cicloheximide or 6-dimethylaminopurine. *Theriogenology* **1997**; 48:1161-1172.
- Sawai F, Funahashi H, Niwa K. Stage-specific requirement of cysteine during *in vitro* maturation of porcine oocytes for glutathione synthesis associated with male pronuclear formation. *Biol Reprod* **1997**; 57:1-6.
- Schatten G. The centrosome and its mode of inheritance: the reduction of the centrosome during gametogenesis and its restoration during fertilization. *Dev Biol* **1994**; 165:299-335.
- Schultz RM. Meiotic maturation on mammalian oocytes. En: wassarman PM (ed.), *Element of mammalian fertilization*. Boston: CRC Press **1991**:77-104.
- Sette C, Bevilacqua A, Geremia R, Rossi P. Involvement of phospholipase Cgamma1 in mouse egg activation induced by a truncated form of the C-kit tyrosine kinase present in spermatozoa. *J Cell Biol* **1998**; 24:142:1063-1074.

- Shen X, Miyano T, Kato S. *In vivo* and *in vitro* antrum formation of pig ovarian follicles. In: Miyamoto H, Manabe N, editors. Reproductive biology update, Kyoto: shokado Co: **1998**; 73-79.
- Shimada M, Terada T. Phosphatidylinositol 3-kinase in cumulus cells and oocytes is responsible for activation of oocyte mitogen-activated protein kinase during meiotic progression beyond the meiosis I stage in pigs. *Biol Reprod* **2001**; 64:1106-1114.
- Silva CP, Kommineni K, Oldenbourg R, Keefe DJ. The first polar body does not predict accurately the location of the metaphase II meiotic spindle in mammalian oocytes. *Fertil Steril* **1999**; 71:719-721.
- Sinowatz F, Kolle S, Topfer-Petersen E. Biosynthesis and expression of zona pellucida glycoproteins in mammals. *Cells Tissues Organs* **2001**; 168:24-35.
- Sirard MA. Resumption of meiosis: mechanism involved in meiotic progression and its relation with developmental competence. *Theriogenology* **2001**; 55:1241-1254.
- Sirard MA, Dufort I, Coenen K, Tremblay K, Massicotte L, Robert C. The use of genomics and proteomics to understand oocyte and early embryo functions in farm animals. *Reprod Suppl* **2003**; 61:117-129.
- Sirotkin AV, Duksova J, Makarevich AV, Kubek A, Bulla J. Evidence that growth factors IGF-I, IGF-II and EGF can stimulate nuclear maturation of porcine oocytes via intracellular protein kinase A. *Reprod Nutr Dev* **2000**; 40:559-569.
- Soong YK, Wang HS, Cheng SY, Chien HJ. Expression of insulin-like growth factor-binding protein-1 (IGFBP-1) mRNA in embryos and endometrial stromal cells. *Mol Hum Reprod* **1998**; 4:153-157.
- Sousa M, Barros A, Tesarik J. Developmental changes in calcium dynamics, protein kinase C distribution and endoplasmic reticulum organization in human preimplantation embryos. *Mol Hum Reprod* **1996**; 2:967-977.
- Staigmiller RB, Moor RM. Effects of follicle cells on the maturation and development competence of ovine oocytes matured outside the follicle. *Gamete Res* **1984**; 9:221-229.
- Stone BA, Seaman RF, Nelly RW, Deam S. Production of steroids and release of prostaglandins by spherical pig blastocysts *in vitro*. *Aust J Biol Sci* **1986**; 39:283-294.
- Stroband HW, Van der Lende T. Embryonic and uterine development during early pregnancy in pigs. *J Reprod Fertil Suppl* **1990**; 40:261-277.
- Stromstedt M, Biyskov AG. Oocyte, Mammalian. In: Encyclopedia of Reproduction. Ed: E. Knobil and JD. Neill. Academic Press, San Diego, USA, **1999**; 3:468-480
- Sun QY, Lai L, Wu GM, Park KW, Day BN, Prather RS, Schatten H. Microtubule assembly after treatment of pig oocytes with taxol: correlation with chromosomes, gamma-tubulin, and MAP kinase. *Mol Reprod Dev* **2001**; 60:481-490.
- Suzuki F, Yanagimachi R. Changes in the distribution of intramembranous particles and filipin-reactive membrane sterols during *in vitro* capacitation of golden hamster spermatozoa. *Gamete Res* **1989**; 23:335-347.
- Swann K. A cytosolic sperm factor stimulates repetitive calcium increases and mimics fertilization in hamster eggs. *Development* **1990**; 110:1295-1302.

- Terada Y, Luetjens CM, Sutovsky P, Schatten G. Atypical decondensation of the sperm nucleus, delayed replication of the male genome, and sex chromosome positioning following intracytoplasmic human sperm injection (ICSI) into golden hamster eggs: does ICSI itself introduce chromosomal anomalies? *Fertil Steril* **2000**; 74:454-460.
- Tesarik J, Sousa M. Key elements of a highly efficient intracytoplasmic sperm injection technique:  $Ca^{2+}$  fluyes and oocyte cytoplasm dislocation. *Fert-Steril* **1995**; 64: 770-776.
- Thibault C, Szollosi D, Gerard M. Mammalian oocyte maturation. *Reprod Nutr Dev* **1987**; 27:865-896.
- Thibordeaux JK, Myers MW, Hansel W. The beneficial effect of incubating bovine embryos in groups are due to platelet-derived growth factor. *Theriogenology* **1995**; 43:336(abstract).
- Thompson JG. In vitro culture and embryo metabolism of cattle and sheep embryos-a decade of achievement. *Animal Reproduction Science* **2000**; 60-61:263-275.
- Töpfer-Petersen E, Petrounkina AM, Ekhlesi-Hundrieser M. Oocyte-sperm interactions. *Anim Reprod Sci* **2000**; 60-61:653-662.
- Uehara T, Yanahimachi R. Microsurgical injection of spermatozoa into hamster eggs with subsequent transformation of sperm nuclei into male pronuclei. *Biol. Reprod* **1976**; 15: 467-470.
- Vigeneron C, Perreau C, Dalbiès-Tran R, Joly C, Humblot P, Uzbekova S, Mermillod P Protein synthesis and mRNA storage in cattle oocytes maintained under meiotic block by roscovitine inhibition of MPF activity. *Mol Reprod Dev* **2004a**; 69, 457-465.
- Vigeneron C, Perreau C, Dupont J, Uzbekova S, Prigent C, Mermillod P. Several signaling pathways are involved in the control of cattle oocyte maturation. *Mol Reprod Dev* **2004b**; 69: 466-474.
- Villa- Diaz LG, Miyano T. Activation of p38 MAPK during porcine oocyte maturation. *Biol Reprod* **2004**; 71:691-696.
- Wang WH, Abeydeera LR, Cantley TC, Day BN. Effects of oocyte maturation media on development of pig embryos produced by *in vitro* fertilization. *J Reprod Fertil* **1997**; 111:101-108.
- Wang WH, Abeydeera LR, Fraser LR, Niwa K. Functional analysis using chlortetracycline fluorescence and *in vitro* fertilization of frozen-thawed ejaculated boar spermatozoa incubated in a protein-free chemically defined medium. *J Reprod Fertil* **1995**;104:305-313.
- Wassarman PM. Zona pellucida glycoproteins. *Annu Rev Biochem* **1988**; 57: 415-442.
- Wilding M, Fiorentino A, De Simone ML, Infante V, De Matteo L, Marino M, Dale B. Energy substrates, mitochondrial membrane potential and human preimplantation embryo division. *Reprod Biomed Online* **2002**; 5:39-42.
- Williams CJ. Signalling mechanisms of mammalian oocyte activation. *Hum Reprod Update* **2002**; 8:313-321.
- Wolny YM, Fissore RA, Wu H, Reis MM, Colombero LT, Ergun B, Rosenwaks Z, Palermo GD. Human glucosamine-6-phosphate isomerase, a homologue of hamster oscillin, does not appear to be involved in  $Ca^{2+}$  release in mammalian oocytes. *Mol Reprod Dev* **1999**; 52:277-287.

- Wu B, Ignatz G, Currie WB, Yang X. Dynamics of maturation-promoting factor and its constituent proteins during *in vitro* maturation of bovine oocytes. *Biol Reprod* **1997**; 56:253-259.
- Wu J, Carrell DT, Wilcox AL. Development of *in vitro*-matured oocytes from porcine preantral follicles following intracytoplasmic sperm injection. *Biol Reprod* **2001**; 65:1579-1585.
- Xu X, Seth PC, Harbinson DS, Foxcroft GR. Semen dilution for assessment of boar ejaculates quality in pig IVM and IVF systems. *Theriogenology* **1996**; 45:1325-1327.
- Yamauchi N, Sasada H, Sugawara S, Nagai T. Effect of culture conditions on artificial activation of porcine oocytes matured *in vitro*. *Reprod Fertil Dev* **1996**; 8:1153-1156.
- Yanagimachi R. Mammalian fertilization. In: *The Physiology of Reproduction*. Ed: Knobil E and Neill JD. Raven Press, New York, USA, **1988**; 135-185.
- Yanagimachi R. Mammalian fertilization. In: *The Physiology of Reproduction*. Ed: Knobil E and Neill JD. Raven Press, New York, USA, **1994**; Vol 1:189-317.
- Yanagimachi R. The mammalian oocyte's response to intracytoplasmic sperm injection (ICSI). *Microscopy of Reprod and Dev: A dynamic approach* **1997**; 187-195.
- Yao LJ, Fan HY, Tong C, Chen DY, Schatten H, Sun QY. Polo-like kinase-1 in porcine oocyte meiotic maturation, fertilization and early embryonic mitosis. *Cell Mol Biol* **2003**; 49:399-405.
- Yonemura I, Fujino Y, Irie S, Miura Y. Transcervical transfer of porcine embryos under practical conditions. *J Reprod Dev* **1996**; 42:89-94.
- Yoshida M, Ishigaki Y, Nagai T, Chikyu M, Pursel VG. Glutathione concentration during maturation and after fertilization in pig oocytes: relevance to the ability of oocytes to form male pronucleus. *Biol Reprod* **1993**; 49:89-94.
- Yoshida M, Ishizaki Y, Kawagishi H. Blastocyst formation by pig embryos resulting from in-vitro fertilization of oocytes matured *in vitro*. *J Reprod Fertil* **1990**; 88:1-8.
- Yoshida M, Ishizaki Y, Kawagishi H, Bamba K, Kojima Y. Effects of pig follicular fluid on maturation of pig oocytes *in vitro* and on their subsequent fertilizing and developmental capacity *in vitro*. *J Reprod Fertil* **1992**; 95:481-488.
- Yoshida M, Ishigaki K, Pursel VG. Effect of maturation media on male pronucleus formation in pig oocytes matured *in vitro*. *Mol Reprod Dev* **1992**; 31:68-71.
- Yoshida M. Role of glutathione in the maturation and fertilization of pig oocytes *in vitro*. *Mol Reprod Dev* **1993**; 35:76-81.
- Yoshioka K, Suzuki C, Tanaka A, Anas IM, Iwamura S. Birth of piglets derived from porcine zygotes cultured in a chemically defined medium. *Biol Reprod* **2002**; 66:112-119.
- Yurewicz EC, Sacco AG, Subramanian MG. Pathways to immunocontraception: biochemical and immunological properties of glycoprotein antigens of the porcine zona pelucida. *Adv Exp Med Biol* **1986**; 207:407-427.
- Zheng YS, Sirard MA. The effect of sera, bovine serum albumin and follicular cells on *in vitro* maturation and fertilization of porcine oocytes. *Theriogenology* **1992**; 37:779-7790.