

REFERENCES

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- Abdalla, H., M. Shimoda, H. Hara, H. Morita, M. Kuwayama, M. Hirabayashi and S. Hoshi. 2010. Vitrification of ICSI- and IVF-derived bovine blastocysts by minimum volume cooling procedure: effect of developmental stage and age. *Theriogenology*. 74: 1028-1035.
- Abdullah, R.B., S.L. Liow, A.N.M.A. Rahman, W.K. Chan, W.E. Wan Khadijah and S.C. Ng. 2008. Prolonging the interval from ovarian hyperstimulation to laparoscopic ovum pick-up improves oocyte yield, quality, and developmental competence in goats. *Theriogenology*. 70: 765-771.
- Abdullah, R.B., W.E. Wan Khadijah and P.J. Kwong. 2011. Comparison of intra- and interspecies nuclear transfer techniques in the production of cloned caprine embryos. *Small Ruminant Research*. 98: 196-200.
- Abe, S. and Y. Shioya. 1996. Effects of temperature and duration of preservation of bovine ovaries in physiological saline on the development of bovine embryos derived from follicular oocytes matured and fertilized *in vitro*. *Animal Science and Technology Japan*. 67: 633-638.
- Abeydeera, L.R. and B.N. Day. 1997a. Fertilization and subsequent development *in vitro* of pig oocytes inseminated in a modified Tris-buffered medium with frozen-thawed ejaculated spermatozoa. *Biological Reproduction*. 57: 729-734.
- Abeydeera, L.R. and B.N. Day. 1997b. *In vitro* penetration of pig oocytes in a modified tris-buffered medium: effect of BSA, caffeine and calcium. *Theriogenology*. 48(4): 537-544.
- Abeydeera, L.R., W.H. Wang, T.C. Cantley, A. Rieke and B.N. Day. 1998. Coculture with follicular shell pieces can enhance the developmental competence of pig oocytes after *in vitro* fertilization: relevance to intracellular glutathione. *Biological Reproduction*. 58: 213-218.
- Abeydeera, L.R., W.H. Wang, T.C. Cantley, A. Rieke, C.N. Murphy, R.S. Prather and B.N. Day. 2000. Development and viability of pig oocytes matured in a protein-free medium containing epidermal growth factor. *Theriogenology*. 54: 787-797.
- Abramczuck, J., D. Solter and H. Koprowski. 1977. The beneficial effect of EDTA on development of mouse one-cell embryos in chemically defined medium. *Developmental Biology*. 61: 378-383.
- Agrawal, K.P. 1992. Factors affecting oocyte recovery from caprine ovaries of abattoir origin. *In: Recent Advances in Goat Production*. Editor: R.R. Lokeshwar. Proceeding Vth International Conference on Goats. pp. 1207-1210.
- Agrawal, K.P., T. Sharma, C. Sexana and N. Sharma. 1995. Chronology of first meiotic events of caprine oocytes matured *in vitro*. *Indian Journal of Animal Sciences*. 65: 285-288.
- Aitken, J.R., 1994. A free radical theory of male infertility. *Reproduction, Fertility and Development*. 6: 19-24.

- Akerlof, E., B. Fredicson, O. Gustafsson, A. Lundin, N.O. Lunell, L. Nylund, L. Rosenborg and A. Pousette. 1987. Comparison between a swim-up and a Percoll gradient technique for the separation of human spermatozoa. *International Journal of Andrology*. 10: 663-669.
- Akinlosotu, B.A. and C.D. Wilder. 1993. Fertility and blood progesterone levels following LHRH-induced superovulation in FSH-treated anestrous goats. *Theriogenology*. 40: 895-904.
- Akusu, M.O. and G.N. Egbunike. 1984. Fertility of the West African Dwarf goat in native environment following PGF_{2α} induced estrus. *Veterinary Quarterly*. 6: 173-176.
- Al Yacoub, A.N., M. Gauly and W. Holtz. 2010. Open pulled straw vitrification of goat embryos at various stages of development. *Theriogenology*. 73: 1018-1023.
- Alberio, R., V. Zakhartchenko, J. Motlik and E. Wolf. 2001. Mammalian oocyte activation: lessons from the sperm and implications for nuclear transfer. *International Journal of Developmental Biology*. 45: 797-809.
- Alexander, B., G. Coppola, D.Di Berardino, G.J. Rho, E. St John, D.H. Betts and W.A. King. 2006. The effect of 6-dimethylaminopurine (6-DMAP) and cycloheximide (CHX) on the development and chromosomal complement of sheep parthenogenetic and nuclear transfer embryos. *Molecular Reproduction and Development*. 73: 20-30.
- Ali, J. and J.N. Shelton. 1993a. Design of vitrification solutions for the cryopreservation of embryos. *Journal of Reproduction and Fertility*. 99: 471-477.
- Ali, J. and J.N. Shelton. 1993b. Successful vitrification of day-6 sheep embryos. *Journal of Reproduction and Fertility*. 99: 65-70.
- Alm, H., H. Torner, U. Tiemann and W. Kanitz. 1998. Influence of organochlorine pesticides on maturation and post fertilization development of bovine oocytes *in vitro*. *Reproductive Toxicology*. 12: 559-563.
- Alm, H., H. Torner, B. Löhcke, T. Viergutz, I.M. Ghoneim and W. Kanitz. 2005. Bovine blastocyst development rate *in vitro* is influenced by selection of oocytes by brilliant cresyl blue staining before IVM as indicator for glucose-6-phosphate dehydrogenase activity. *Theriogenology*. 63: 2194-2205.
- Alvarez, J.G., J.L. Lasso, L. Blasco, R.C. Nufiez, S. Heyner, P.P. Caballero and B.T. Storey. 1993. Centrifugation of human spermatozoa induces sublethal damage; separation of human spermatozoa from seminal plasma by dextran swim-up procedure without centrifugation extends their motile lifetime. *Human Reproduction*. 8: 1087-1092.
- Aman, R.R. and J.E. Parks. 1994. Effect of cooling and re-warming on the meiotic spindle and chromosomes of *in vitro* matured bovine oocytes. *Biology of Reproduction*. 50: 103-110.
- Amir, A.A. 2006. Production of caprine embryos through *in vitro* maturation, fertilisation and culture (IVMFC) techniques. MSc Thesis. University of Malaya. Kuala Lumpur, Malaysia.

- Amoah, E.A. and S. Gelaye. 1990. Superovulation, synchronization and breeding of does. *Small Ruminant Research*. 3: 63-72.
- Anguita, B., A.R. Jimenez-Macedo, D. Izquierdo, T. Mogas and M.T. Paramio. 2007. Effect of oocyte diameter on meiotic competence, embryo development, p34 (cdc2) expression and MPF activity in prepubertal goat oocytes. *Theriogenology*. 67: 526-536.
- Anifandis, G., E. Koutselini, I. Stefanidis, V. Liakopoulos, C. Leivaditis, T. Mantzavinos and N. Vamvakopoulos. 2005. Serum and follicular fluid leptin levels are correlated with human embryo quality. *Reproduction*. 130: 917-921.
- Arav, A. 1992. Vitrification of oocytes and embryos. *In: New Trends in Embryo Transfer*. Editors: A. Lauria and F. Gandolfi. Portland Press. pp. 255-264.
- Arav, A., D. Shehu and M. Mattioli. 1993. Osmotic and cytotoxic study of vitrification of immature bovine oocytes. *Journal of Reproduction and Fertility*. 99: 353-358.
- Arav, A., S. Yavin, Y. Zeron, D. Natan, I. Dekel and H. Gacitua. 2002. New trends in gamete's cryopreservation. *Molecular Cell Endocrinology*. 187: 77-81.
- Armstrong, D.T. 2001. Effects of maternal age on oocyte developmental competence. *Theriogenology*. 55: 1303-1322.
- Armstrong, D.T., A.P. Pfitzner, G.M. Warnes, M.M. Ralph and R.F. Seamark. 1983a. Endocrine responses of goats after induction of superovulation with PMSG and FSH. *Journal of Reproduction and Fertility*. 67: 395-401.
- Armstrong, D.T. 2001. Effects of maternal age on oocyte developmental competence. *Theriogenology*. 55: 1303-1322.
- Armstrong, D.T., A.P. Pfitzner, G.M. Warnes and R.F. Seamark. 1983b. Superovulation treatments and embryo transfer in Angora goats. *Journal of Reproduction and Fertility*. 67: 403-410.
- Ax, R.L. and R.W. Lenz. 1987. Glycosaminoglycans as probes to monitor differences in fertility of bulls. *Journal of Dairy Science*. 70: 1477-1486.
- Bachvarova, R.F. 1992. A maternal tail of poly(A): the long and the short of it. *Cell*. 69: 895-897.
- Bagg, M.A., M.B. Nottle, D.T. Armstrong and C.G. Grupen. 2007. Relationship between follicle size and oocyte developmental competence in prepubertal and adult pigs. *Reproduction, Fertility and Development*. 19: 797-803.
- Bailey, J.L. and M.M. Buhr. 1994. Cryopreservation alters the Ca²⁺ flux of bovine spermatozoa. *Canadian Journal of Animal Science*. 74: 45-51.
- Bailey, J., A. Morrier and N. Cornier. 2002. Semen cryopreservation: Successes and persistent problems in farm species. *Symposium on Canadian Society of Animal Science*. Québec, Canada. pp. 87-95.

- Baker, M.A. and R.J. Aitken. 2004. The importance of redox regulated pathways in sperm cell biology. *Molecular and Cellular Endocrinology*. 216: 47-54.
- Baldassarre, H. and C.N. Karatzas. 2004. Advanced assisted reproduction technologies (ART) in goats. *Animal Reproduction Science*. 82-83: 255-266.
- Baldassarre, H., D.G. de Matos, C.C. Furnus, T.E. Castro and E.I. Cabrera Fischer. 1994. Technique for efficient recovery of sheep oocytes by laparoscopic folliculocentesis. *Animal Reproduction Science*. 35: 145-150.
- Baldassarre, H., B.Wang, N. Kafidi, C.L. Keefer, A. Lazaris and C.N. Karatzas. 2002. Advances in the production and propagation of transgenic goats using laparoscopic ovum pick-up and *in vitro* embryo production technologies. *Theriogenology*. 57: 275-284.
- Baldassarre, H., K.M. Rao, N. Neveu, E. Brochu, I. Begin, E. Behboodi and D.K. Hockley. 2007. Laparoscopic ovum pick-up followed by *in vitro* embryo production for the reproductive rescue of aged goats of high genetic value. *Reproduction, Fertility and Development*. 19: 612-616.
- Ball, G.D., M.L. Leibfried, R.W. Lenz, R.L. Ax, B.D. Bavister and N.L. First. 1983. Factors affecting successful *in vitro* fertilization of bovine follicular oocytes. *Biology of Reproduction*. 28: 717-725.
- Baril, G., J. Pougard, V. Freitas, B. Leboeuf and J. Saumande. 1996. A new method for controlling the precise time of occurrence of the preovulatory gonadotropin surge in superovulated goats. *Theriogenology*. 45: 697-706.
- Baril, G., A.S. Traldi, Y. Cognie, B. Leboeuf, J.F. Beckers and P. Mermillod. 2001. Successful direct transfer of vitrified sheep embryos. *Theriogenology*. 56: 299-305.
- Barton, S.C., M.A. Surani and M.L. Norris. 1984. Role of paternal and maternal genomes in mouse development. *Nature*. 311: 374-376.
- Battye, K.M., R.J. Fairclough, A.W.N. Cameron, A.O. Trounson. 1988. Evidence for prostaglandin involvement in early luteal regression of the superovulated nanny goat (*Capra hircus*). *Journal of Reproduction and Fertility*. 84: 425-430.
- Bautista, J.A. and H. Kanagawa. 1998. Current status of vitrification of embryos and oocytes in domestic animals: Ethylene glycol as an emerging cryoprotectant of choice. *Japanese Journal of Veterinary Research*. 45: 183-191.
- Bavister, B.D. 1981. Substitution of a synthetic polymer for protein in a mammalian gamete culture system. *Journal of Experimental Zoology*. 217(1): 45-51.
- Bavister, B.D. 1982. Evidence for a role of postovulatory cumulus components in supporting fertilizing ability of hamster spermatozoa. *Journal of Andrology*. 3: 365-372.
- Bavister, B.D. 2000. Interactions between embryos and the culture milieu. *Theriogenology*. 53: 619-626.

- Bavister, B.D., T.A. Rose-Hellekant and T. Pinyopummintr. 1992. Development of *in vitro* matured/*in vitro* fertilized bovine embryos into morulae and blastocysts in defined culture media. *Theriogenology*. 37: 127-146.
- Begin, I., B. Bhatia, H. Baldassarre, A. Dinnyes and C.L. Keefer. 2003. Cryopreservation of goat oocytes and *in vivo* derived 2- to 4-cell embryos using the cryoloop and solid-surface vitrification methods. *Theriogenology*. 59: 1839-1850.
- Behalova, E. and T. Greve. 1993. Penetration rate of cumulus-enclosed versus denuded bovine eggs fertilized *in vitro*. *Theriogenology*. 39: 186 (abstract).
- Bhojwani, S., H. Alm, H. Torner, W. Kanitz and R. Poehland. 2007. Selection of developmentally competent oocytes through brilliant cresyl blue stain enhances blastocyst development rate after bovine nuclear transfer. *Theriogenology*. 67: 341-345.
- Bhuiyan, M.M.U., S.K. Kang and B.C. Lee. 2007. Effects of fructose supplementation in chemically defined protein-free medium on development of bovine *in vitro* fertilized embryos. *Animal Reproduction Science*. 102: 137-144.
- Biggers, J.D., M.C. Summers and L.K. McGinnis. 1997. Polyvinyl alcohol and amino acids as substitute for bovine serum albumin in culture media for mouse pre-implantation embryos. *Human Reproduction Update*. 3: 125-135.
- Bilodeau-Goeseels, S. and P. Panich. 2002. Effects of oocyte quality on development and transcriptional activity in early bovine embryos. *Animal Reproduction Science*. 71: 143-155.
- Bilton, R.J. and N.W. Moore. 1976. *In vitro* culture, storage and transfer of goat embryos. *Journal of Biological Sciences*. 9: 125-129.
- Blondin, P. and M.A. Sirard. 1995. Oocyte and follicular morphology as determining characteristics for developmental competence in bovine oocytes. *Molecular Reproduction and Development*. 41: 54-62.
- Blondin, P., K. Coenen, L.A. Guilbault and M.A. Sirard. 1997. *In vitro* production of bovine embryos: developmental competence is acquired before maturation. *Theriogenology*. 47: 1061-1075.
- Boccart, C., P. Metmillod, C. Delecoeuillerie and F. Dessy. 1991. Bovine oviduct cell monolayers for supporting the blastocyst formation of bovine embryos. *Theriogenology*. 35: 238.
- Boediono, A., T. Suzuki and R.A. Godke. 2003. Comparison of hybrid and purebred *in vitro*-derived cattle embryos during *in vitro* culture. *Animal Reproduction Science*. 78: 1-11.
- Bols, P.E.J. 2005. Puncture of immature ovarian follicles in bovine assisted reproduction. *Verhandelingen Koninklijke Academie voor Geneeskunde van België*. 67 (3): 177-202.
- BonDurant, R.H. 1986. Induction of estrus in does by introduction of buck or photoperiod manipulation. *In: Current Therapy in Theriogenology*. Editor: D.A. Morrow. Saunders Company, Philadelphia. pp. 579-581.

- Bongso, A., N. Soon-Chye, H. Sathananthan, N.P. Lian, M. Rauff and S. Ratnam. 1989. Improved quality of human embryos when cocultured with human ampullary cells. *Human Reproduction*. 4: 706-713.
- Bongso, A., N.C. Ng and S. Ratnem. 1990. Co-cultures: their relevance to assisted reproduction. *Human Reproduction*. 5: 893-900.
- Bongso, A. and C.Y. Fong. 1993. The effect of coculture on human zygote development. *Current Opinion in Obstetric and Gynecology*. 5: 585-593.
- Boni, R., A. Cuomo and E. Tosti. 2002. Developmental potential in bovine oocytes is related to cumulus-oocyte complex grade, calcium current activity, and calcium stores. *Biology of Reproduction*. 66: 836-842.
- Bos-Mikich, A., K. Swann, D.G Whittingham. 1995. Calcium oscillations and protein synthesis inhibition synergistically activate mouse oocytes. *Molecular Reproduction and Development*. 41: 84-90.
- Brackett, B.G. and G. Oliphant. 1975. Capacitation of rabbits spermatozoa *in vitro*. *Biology of Reproduction*. 12: 260-274.
- Brackett, B.G. and K. Zuelke. 1993. Analysis of factors involved in the *in vitro* production of bovine embryos. *Theriogenology*. 39: 43-64.
- Braun, J., T. Hirsch, W. Krause and A. Ziegler. 1991. Evaluation of the acrosome reaction using monoclonal antibodies against different acrosomal antigens-comparison with the triple-stain technique. *International Journal of Andrology*. 14: 431-436.
- Brison, D.R. and R.M. Schultz. 1997. Apoptosis during mouse blastocyst formation: evidence for a role for survival factors including transforming growth factor alpha. *Biology of Reproduction*. 56: 1088-1096.
- Bronson, R.A. and A. McLaren. 1970. Transfer of the mouse oviduct of eggs with and without the zona pellucida. *Journal of Reproduction and Fertility*. 22: 129-137.
- Broussard, J.R., J.K. Thibodeaux, M.W. Myers, J.D. Roussel, S.G. Prough, J. Blackwell and R.A. Rodke. 1994. Frozen-thawed cumulus-granulosa cells support bovine embryo development during coculture. *Fertility and Sterility*. 62: 176-180.
- Bruck, I., J. Bezar, M. Baltsen, B. Synnestvedt, I. Couty, T. Grevel and G. Duchamp. 2000. Effect of administering a crude equine gonadotrophin preparation to mares on follicular development, oocyte recovery rate and oocyte maturation *in vivo*. *Journal of Reproduction and Fertility*. 118: 351-360.
- Buccione, R., B.C. Vanderhyden, P.J. Caron and J.J. Eppig. 1990. FSH-induced expansion of the mouse cumulus oophorus *in vitro* is dependent upon a specific factor(s) secreted by the oocyte. *Developmental Biology*. 138: 16-25.
- Buggin-Daubie, M., F. Fiéni, M. Buggin, J.F. Bruyas and D. Tainturier. 1992. Coculture of early stage caprine embryos on different cellular monolayers. *Proceeding of 12th International Congress Animal Reproduction AI*. 3: 373-375.

- Cala, P.M. 1983. Volume regulation by red blood cells: mechanisms of ion transport. *Molecular Physiology*. 4: 33-52.
- Cameron, A.W.N., K.M. Battye and A.O. Trounson. 1988. Time of ovulation in goats (*Capra hircus*) induced to superovulate with PMSG. *Journal of Reproduction and Fertility*. 83: 747-752.
- Camous, S., Y. Heyman, W. Meziou and Y. Ménézo. 1984. Cleavage beyond the block stage and survival after transfer of early bovine embryos cultured with trophoblastic vesicles. *Journal of Reproduction and Fertility*. 72: 479-485.
- Campos-Chillon, L.F., T.K. Suh, M. Barcelo-Fimbres, G.E. Seidel Jr. and E.M. Carnevale. 2009. Vitrification of early-stage bovine and equine embryos. *Theriogenology*. 71: 349-354.
- Carnegie, J.A., R. Durnford, J. Algire and J. Morgan. 1997. Evaluation of mitomycin-treated vero cells as a co-culture system for IVM-IVF derived bovine embryos. *Theriogenology*. 48: 377-389.
- Carney, E.W., C. Tobback and R.H. Foote. 1990. Co-culture of rabbit one cell embryos with rabbit oviduct epithelial cells. *In Vitro Cell Developmental Biology*. 26: 629-635.
- Carolan, C., P. Lonergan, A. Van Langendonck and P. Mermillod. 1995. Factors affecting bovine embryo development in synthetic oviduct fluid following oocyte maturation and fertilization *in vitro*. *Theriogenology*. 43: 1115-1128.
- Catt, J.W. 1990. Operation of a bovine IVF centre. Proceedings of the 3rd symposium on advanced topics in animal reproduction FCAV-UNESP, Jaboticabal. 89-100.
- Chan, W.K. 2008. Developmental competence of *in vitro* fertilised embryos following hyperstimulation procedure and vitrification of *in vitro* produced caprine embryos. MSc Thesis. University of Malaya. Kuala Lumpur, Malaysia.
- Chang, C.L., T.H. Wang, S.G. Horng, H.M. Wu, H.S. Wang and Y.K. Soong. 2002. The concentration of inhibin B in follicular fluid: relation to oocyte maturation and embryo development. *Human Reproduction*. 17: 1724-1728.
- Che, L., A. Lalonde and V. Bordignon. 2007. Chemical activation of parthenogenetic and nuclear transfer porcine oocytes using ionomycin and strontium chloride. *Theriogenology*. 67: 1297-1304.
- Chen, S.U., Y.R. Lien, Y.Y. Cheng, H.F. Chen, H.N. Ho and Y.S. Yang. 2001. Vitrification of mouse oocytes using closed pulled straws (CPS) achieves a high survival and preserves good patterns of meiotic spindles, compared with conventional straws, Open Pulled Straws (OPS) and grids. *Human Reproduction*. 16: 2350-2356.
- Chian, R.C., K. Niwa and H. Nakahara. 1992. Effect of sperm penetration *in vitro* on completion of first meiosis by bovine oocytes arrested at various stages in culture. *Journal of Reproduction and Fertility*. 96: 73-78.
- Chian, R.C., K. Okuda and K. Niwa. 1995. Influence of cumulus cells on *in vitro* fertilization of bovine oocytes derived from *in vitro* maturation. *Animal Reproduction Science*. 38: 37-48.

- Chian, R.C., C.K. Park and M.A. Sirard. 1996. Cumulus cells act as a sperm trap during *in vitro* fertilization of bovine oocytes. *Theriogenology*. 45: 258 (abstract).
- Chiu, T.T., M.S. Rogers, E.L. Law, C.M. Briton-Jones, L.P. Cheung and C.J. Haines. 2002. Follicular fluid and serum concentrations of myo-inositol in patients undergoing IVF: relationship with oocyte quality. *Human Reproduction*. 17: 1591-1596.
- Cibelli, J.B., S.L. Stice, P.J. Golueke, J.J. Kane, J. Jerry, C. Blackwell, F.A.P. de León and J.M. Robi. 1998. Cloned transgenic calves produced from nonquiescent fetal fibroblasts. *Science*. 280: 1256-1258.
- Cocera, M.J., A.L. Sebastian, M.L. Barragan and R.A. Picazo. 1996. Differences in post-thawing survival between ovine morula and blastocysts cryopreserved with ethylene glycol or glycerol. *Cryobiology*. 33: 502-507.
- Cognié, Y., N. Poulin, P. Pignon, J. Sulon, J.F. Beckers and Y. Guerin. 1995a. Does heparin affect developmental ability of IVP goat oocytes? Proceeding of 11th Meeting AETE. 146 (abstract).
- Cognié, Y., N. Poulin, C. Pisselet and D. Monniaux. 1995b. Effect of atresia on the ability of follicular fluid to support cytoplasmic maturation of sheep oocytes *in vitro*. *Theriogenology*. 43: 188 (abstract).
- Cognié Y. State of the art in sheep-goat embryo transfer. 1999. *Theriogenology*. 51: 105-116.
- Cognié, Y. and N. Poulin. 2000. Developmental competence of goat oocytes is increased after *in vitro* maturation with follicular fluid from goats stimulated by gonadotropins. Proceeding of 14th International Congress Animal Reproduction. 18: 39 (abstract).
- Cognié, Y., N. Poulin, G. Baril, F. Guignot, J.F. Beckers and P. Mermillod. 2001. Embryo survival after transfer of *in vitro* and *in vivo* produced goat embryos. Proceedings of the 17th scientific meeting of European embryo transfer association (AETE). pp. 110 (abstract).
- Cognié, Y., G. Baril, N. Poulin and P. Mermillod. 2003. Current status of embryo technologies in sheep and goat. *Theriogenology*. 59: 171-188.
- Collas, P. and J.M. Robl. 1990. Factors affecting efficiency of nuclear transplantation in the rabbit embryo. *Biology of Reproduction*. 43: 877-884.
- Collas, P., E.J. Sullivan and F.L. Barnes. 1993. Histone H1 kinase activity in bovine oocytes following calcium stimulation. *Molecular Reproduction and Development*. 34: 224-231.
- Collas, P., T. Chang, C. Long and J.M. Robl. 1995. Inactivation of histone H1 kinase by Ca²⁺ in rabbit oocytes. *Molecular Reproduction and Development*. 40: 253-258.
- Conrad, P.B., D.P. Miller, P.R. Cielenski and J.J. de Pablo. 2000. Stabilization and preservation of lactobacillus acidophilus in saccharide matrices. *Cryobiology*. 41 (1): 17-24.

Corn, C.M., C. Hauser-Kronberger, M. Moser, G. Tews and T. Ebner. 2005. Predictive value of cumulus cell apoptosis with regard to blastocyst development of corresponding gametes. *Fertility and Sterility*. 84: 627-633.

Cox, J.F. 1991. Effect of the cumulus cells on *in vitro* fertilization of *in vitro* matured cow and sheep oocytes. *Theriogenology*. 35: 191 (abstract).

Cox, J.F., J. Hormazabal and A. Santa Maria. 1993. Effect of cumulus on *in vitro* fertilization of bovine matured oocytes. *Theriogenology*. 40: 1259-1267.

Cox, J.F., J. Avila, F. Saravia and A. Santa Maria. 1994. Assessment of fertilizing ability of goat spermatozoa by *in vitro* fertilization of cattle and sheep intact oocytes. *Theriogenology*. 41: 1621-1629.

Cox, J.F., F. Saravia, M. Briones and A. Santa Maria. 1995. Dose-dependent effect of heparin on fertilizing ability of goat spermatozoa. *Theriogenology*. 44:451-460.

Coy, P., E. Martinez, S. Ruiz, J. M. Vazquez, J. Roca, C. Matas and M.T. Pellicer. 1993. *In vitro* fertilization of pig oocytes after different coincubation intervals. *Theriogenology*. 39: 1201-1208.

Coy, P. and R. Romar. 2002. *In vitro* production of pig embryos: a point of view. *Reproduction, Fertility and Development*. 14 (5-6): 275-286.

Cremades, N., M. Sousa, J. Silva, P. Viana, S. Sousa, C. Oliveira, J. Teixeira da Silva and A. Barros. 2004. Experimental vitrification of human compacted morulae and early blastocysts using fine diameter or plastic micropipettes. *Human Reproduction*. 19: 300-305.

Cross, N.L., P. Morales, J.W. Overstreet and F.W. Hanson. 1988. Induction of acrosome reaction by the human zona pellucida. *Biology of Reproduction*. 38: 235-244.

Crozet, N. 1984. Ultrastructural aspects of *in vivo* fertilization in the cow. *Gamete Research*. 10: 241-251.

Crozet, N., V. De Smedt, M. Ahmed-Ali and C. Sevellec. 1993. Normal development following *in vitro* oocyte maturation and fertilization in the goat. *Theriogenology*. 39: 206 (abstract).

Crozet, N., M. Ahmed-Ali and M.P. Dubos. 1995. Developmental competence of goat oocytes from follicles of different size categories following maturation, fertilization and culture *in vitro*. *Journal of Reproduction and Fertility*. 103: 293-298.

Crozet, N., M. Dahirel and L. Gall. 2000. Meiotic competence of *in vitro* grown goat oocytes. *Journal of Reproduction and Fertility*. 118: 367-373.

Dalhausen, R.D., J.B. Bonham, G. Meyers and T.M. Ludwick. 1981. Characterization and maturation of prepubertal calf follicular oocytes *in vitro*. *Theriogenology*. 15: 111.

De, A.K., D. Malakar, Y.S. Akshey, M.K. Jena, S. Garg, R. Dutta and S. Sahu. 2011. *In vitro* development of goat (*Capra hircus*) embryos following cysteamine supplementation of the *in vitro* maturation and *in vitro* culture media. *Small Ruminant Research*. 96: 185-190.

- De Jonge, C.J., R.G. Rawlins and L.J.D. Zaneveld. 1988. Induction of the human sperm acrosome reaction by human oocytes. *Fertility and Sterility*. 50: 949-953.
- De Leeuw, A.M., J.H.G. Den Daas and H. Woelders. 1991. The fix vital stain method. Simultaneous determination of viability and acrosomal status of bovine spermatozoa. *Journal of Andrology*. 12: 112-118.
- De Matos, D.G. and C.C.Furnus. 2000. The importance of having high glutathione level after bovine *in vitro* maturation on embryo development: effect of mercaptoethanol, cysteine and cystine. *Theriogenology*. 53 (3): 761-771.
- De Smedt, V., N. Crozet, M. Ahmed-Ali, A. Marino and Y. Cognié. 1992. *In vitro* maturation and fertilization of goat oocytes. *Theriogenology*. 37: 1049-1060.
- De Smedt, V., N. Crozet and L. Gall. 1994. Morphological and functional changes accompanying the acquisition of meiotic competence in ovarian goat oocyte. *Journal of Experimental Zoology*. 269: 128-139.
- De Sousa, P.A., Q. Winger, J.R. Hill, K. Jones, A.J. Watson and M.E. Westhusin. 1999. Reprogramming of fibroblast nuclei into bovine oocytes. *Cloning*. 1: 63-69.
- De Wit, A.A., Y.A. Wurth and T.A. Kruip. 2000. Effect of ovarian phase and follicle quality on morphology and developmental capacity of the bovine cumulus-oocyte complex. *Journal of Animal Science*. 78: 1277-1283.
- Dekel, N., E. Aberdam and I. Sherizly. 1984. Spontaneous maturation *in vitro* of cumulus enclosed rat oocytes is inhibited by forskolin. *Biology of Reproduction*. 31: 244-250.
- Desai, N.N., E.A. Kennard, D.A. Kniss and C.I. Friedman. 1994. Novel human endometrial cell line promotes blastocyst development. *Fertility and Sterility*. 61: 760-766.
- Desai, N.N. and J.M. Goldfarb. 1998. Co-cultured human embryos may be subjected to widely different microenvironments: pattern of growth factor/cytokine release by Vero cells during the coculture interval. *Human Reproduction*. 13: 1600-1605.
- Dhali, A., V.M. Anchamparuthy, S.P. Butler, R.E. Pearson and F.C. Gwazdauskas. 2009. *In vitro* development of bovine embryos cultured with stem cell factor or insulin-like growth factor-I following IVF with semen of two bulls having different field fertility. *Animal Reproduction Science*. 116: 188-195.
- Dhindsa, D.S., A.S. Hoversland and J. Metcalfe. 1971. Reproductive performance in goats treated with progestagen impregnated sponges and gonadotrophins. *Journal of Animal Science*. 32: 301-305.
- Didion, B.A., D. Pomp, M.J. Martin, G.E. Homanics and C.L. Market. 1990. Observations on the cooling and cryopreservation of pig oocytes at the germinal vesicle stage. *Journal of Animal Science*. 68: 2803-2810.
- Dinnyes, A., Y. Dai, S. Jiang and X. Yang. 2000. High developmental rates of vitrified bovine oocytes following parthenogenetic activation, *in vitro* fertilization, and somatic cell nuclear transfer. *Biology of Reproduction*. 63: 513-518.

- Dirnfeld, M., S. Goldman, Y. Gonen, M. Koifman, I. Calderon and H. Abramovici. 1997. A simplified coculture system with luteinized granulosa cells improves embryo quality and implantation rates: a controlled study. *Fertility and Sterility*. 67: 120-122.
- Dobbs, K.E., D.A. Dumesic, J.A. Dumesic and S.S. Shapiro. 1994. Differences in serum follicle stimulating hormone uptake after intramuscular and subcutaneous human menopausal gonadotropin injection. *Fertility and Sterility*. 62: 978-983.
- Dobrinsky, J.R. and L.A. Johson. 1994. Cryopreservation of porcine embryos by vitrification: A study of *in vitro* development. *Theriogenology*. 42: 25-35.
- Dobrinsky, J.R., L.A. Johnson and D. Rath. 1996. Development of a culture medium (BECM-3) for porcine embryos: Effects of bovine serum albumin and fetal bovine serum on embryo development. *Biology of Reproduction*. 55: 1067-1074.
- Dobrinsky, J.R. 2002. Advancements in cryopreservation of domestic animal embryos. *Theriogenology*. 57: 285-302.
- Dominko, T. and N.L. First. 1992. Kinetics of bovine oocyte maturation allows selection for developmental competence and is affected by gonadotrophins. *Theriogenology*. 37: 203.
- Dominko, T. and N.L. First. 1997a. Relationship between maturational state of oocytes at the time of insemination and sex ratio of subsequent early bovine embryos. *Theriogenology*. 47: 1041-1050.
- Dominko, T. and N.L. First. 1997b. Timing of meiotic progression in bovine oocytes and its effect on early embryo development. *Molecular Reproduction and Development*. 47: 456-467.
- Downs, S.M., A.C. Schroder and J.J. Eppig. 1986. Serum maintains the fertilizability of mouse oocytes matured *in vitro* by preventing hardening of the zona pellucida. *Gamete Research*. 15: 115-122.
- Drion, P.V., V. Furtoss, G. Baril, E. Mamfredi, F. Bouvier, J.L. Pougard, D. Bernelas, P. Caugnon, E.M. McNamara, B. Remy, J. Sulon, J.F. Beckers, L. Bodin and B. Lebouef. 2001. Four year of induction/synchronization of estrus in dairy goats: Effect on the evolution of eCG binding rate in relation with parameters of reproduction. *Reproduction, Nutrition, Development*. 41: 401-412.
- Eckert, J. and H. Niemann. 1995. *In vitro* maturation, fertilization and culture to blastocysts of bovine oocytes in protein-free media. *Theriogenology*. 43 (7): 1211-1225.
- Ectors, F.J., P. Vander Zwalman, K. Touati, J.F. Beckers and F. Ectors. 1989. *In vitro* maturation and fertilization of bovine oocytes. *Theriogenology*. 31: 188 (abstract).
- Edens, M.S., P.K. Galik, K.P. Riddell, M.D. Givens, D.A. Stringfellow and N.M. Loskutoff. 2003. Bovine herpesvirus-1 associated with single, trypsin-treated embryos was not infective for uterine tubal cells. *Theriogenology*. 60: 1495-1504.
- El-Gayar, M. and W. Holtz. 2001. Technical note: Vitrification of goat embryos by the open pulled-straw method. *Journal of Animal Science*. 79: 2436-2438.

- El Shourbagy, S.H., E.C. Spikings, M. Freitas and J.C. St John. 2006. Mitochondria directly influence fertilisation outcome in the pig. *Reproduction*. 131: 233-245.
- Elhassan, Y.M., G. Wu, A.C. Leanez, R.J. Tasca, A.J. Watson and M.E. Westhusin. 2001. Amino acid concentrations in fluids from the bovine oviduct and uterus and in ksom-based culture media. *Theriogenology*. 55 (9): 1907-1918.
- Ellington, J.E., E.W. Camey, P.B. Farrell, M.E. Simkin and R.H. Foote. 1990. Bovine 1-2 cell embryo development using a simple medium in three oviduct epithelial cell coculture systems. *Biology of Reproduction*. 43: 97-104.
- Elzanaty, S., J. Malm and A. Giwercman. 2004. Visco-elasticity of seminal fluid in relation to the epididymal and accessory sex gland function and its impact on sperm motility. *International Journal of Andrology*. 27 (2): 94-100.
- Eppig, J.J., R.R. Freter, P.F. Ward-Bailey and R.M. Schultz. 1983. Inhibition of oocyte maturation in the mouse: Participation of cAMP, steroids and a putative maturation inhibitory factor. *Developmental Biology*. 100: 39-49.
- Exley, G.E., C. Tang, A.S. McElhinny and C.M. Warner. 1999. Expression of caspase and BCL-2 apoptotic family members in mouse preimplantation embryos. *Biology of Reproduction*. 61: 231-239.
- Eyestone, W.H. and N.L. First. 1989. Co-culture of early cattle embryos to the blastocyst stage with oviductal tissue or in conditioned medium. *Journal of Reproduction and Fertility*. 85: 715-720.
- Eyestone, W.H., J.M. Jones and N.L. First. 1991. Some factors affecting the efficacy of oviduct tissue conditioned medium for the culture of early bovine embryos. *Journal of Reproduction and Fertility*. 92: 59-64.
- Eyestone, W.H. and H.A. de Boer. 1993. FSH enhances developmental potential of bovine oocytes matured in chemically defined medium. *Theriogenology*. 39: 216 (abstract).
- Fahy, G.M., D.R. MacFarlane, C.A. Angell and H.T. Merryman. 1984. Vitrification as approach to cryopreservation. *Cryobiology*. 21: 407-426.
- Fahy, G.M. 1986. The relevance of cryoprotectant 'toxicity' to cryobiology. *Cryobiology*. 21: 407-426.
- Fahy, G.M. 1987. Biological effects of vitrification and devitrification. *In: The Biophysics of Organ Preservation*. *Editors: D.E. Pegg and A.M. Karow Junior*. Plenum Publishing Corporation. New York. pp. 265-297.
- Fair, T., P. Hyttel and T. Greve. 1995. Bovine oocyte diameter in relation to maturational competence and transcriptional activity. *Molecular Reproduction and Development*. 42: 437-442.
- Fatehi, A.N., E.C. Zeinstra, R.V. Kooij, B. Colenbrander and M.M. Bevers. 2002. Effect of cumulus cell removal of *in vitro* matured bovine oocytes prior to *in vitro* fertilization on subsequent cleavage rate. *Theriogenology*. 57: 1347-1355.

- Feng, W.G., H.S. Sui, Z.B. Han, Z.L. Chang, P. Zhou, D.J. Liu, S. Bao and J.H. Tan. 2007. Effects of follicular atresia and size on the developmental competence of bovine oocytes: A study using the well-in-drop culture system. *Theriogenology*. 67: 1339-1350.
- Ficarro, S., O. Chertin, V.A. Westbrook, F. White, F. Jayes, P. Kalab, J.A. Marto, J. Shabanowitz, J.C. Herr, D.F. Hunt and P.E. Visconti. 2003. Phosphoproteome analysis of capacitated human sperm. *Journal of Biological Chemistry*. 278: 11579-11589.
- Flesch, F.M., J.F.H.M. Brouwers, P.F.E.M. Nievelstein, A.J. Verkleij, L.M.G. van Golde, B. Colenbrander and B.M. Gadella. 2001. Bicarbonate stimulated phospholipid scrambling induces cholesterol redistribution and enables cholesterol depletion in the sperm plasma membrane. *Journal of Cell Science*. 114: 3543-3555.
- Fraser, L.R. 1985. Albumin is required to support the acrosome reaction but not capacitation in mouse spermatozoa *in vitro*. *Journal of Reproduction and Fertility*. 74: 185-196.
- Freitas, V.J.F., G. Baril, M. Bosc, J. Saumande. 1996. The influence of ovarian status on response to estrus synchronization treatment in dairy goats during the breeding season. *Theriogenology*. 45: 1561-1567.
- Fukuda, Y., M. Ichikawa, K. Naito and Y. Toyoda. 1990. Birth of normal calves resulting from bovine oocytes matured, fertilized and cultured with cumulus cells *in vitro* up to the blastocyst stage. *Biology of Reproduction*. 42: 114-119.
- Fukui, Y. 1990. Effect of follicle cells on acrosome reaction, fertilization and developmental competence of bovine oocytes matured *in vitro*. *Molecular Reproduction and Development*. 26: 40-46.
- Fukui, Y. and H. Ono. 1989. Effect of sera, hormones and granulosa cells added to culture medium for *in vitro* maturation, fertilization and cleavage and development of bovine oocytes. *Journal of Reproduction and Fertility*. 86: 501-506.
- Fukui, Y, L.T. McGowan, R.W. James, P.A. Pugh and H.R. Tervit. 1991. Factors affecting the *in-vitro* development to blastocysts of bovine oocytes matured and fertilized *in vitro*. *Journal of Reproduction and Fertility*. 92: 125-131.
- Funahashi H., E.W. Mcintosh, M.F. Smith and B.N. Day. 1999. The presence of Tissue Inhibitor of Matrix Metalloproteinase-1 (TIMP-1) during meiosis improves porcine "oocyte competence" as determined by early embryonic development after *in vitro* fertilization. *Journal Reproduction Development*. 45: 265-271.
- Gadella, B.M. and R.A. van Gestel. 2004. Bicarbonate and its role in mammalian sperm function. *Animal Reproduction Science*. 82-83: 307-319.
- Gadella, B.M., T.W.J. Gadella Jr, B. Colenbrander, L.M.G. van Golde and M. Lopes-Cardozo. 1994. Visualization and quantification of glycolipid polarity dynamics in the plasma membrane of the mammalian spermatozoon. *Journal of Cell Science*. 107: 2151-2163.

- Gadella, B.M., M. Lopes-Cardozo, L.M.G. van Golde, B. Colenbrander and T.W.J. Gadella Jr. 1995. Glycolipid migration from the apical to the equatorial subdomains of the sperm head plasma membrane precedes the acrosome reaction. Evidence for a primary capacitation event in boar spermatozoa. *Journal of Cell Biology*. 108: 935-946.
- Gall, L., N. Chene, M. Dahirel, D. Ruffini, C. Boulesteix. 2004. Expression of epidermal growth factor receptor in the goat cumulus-oocyte complex. *Molecular Reproduction and Development*. 67: 439-445.
- Gall, L., C. Boulesteix, D. Ruffini and G. Germain. 2005. EGF-induced EGF receptor and MAP kinase phosphorylation in goat cumulus cells during *in vitro* maturation. *Molecular Reproduction and Development*. 71: 489-494.
- Galli, C. and G. Lazzari. Practical aspects of IVM/IVF in cattle. 1996. *Animal Reproduction Science*. 42: 371-379.
- Galli, C., G. Crotti, C. Notari, P. Turini, R. Duchi and G. Lazzari. 2000. Embryo production by ovum pick up from live donors. *Theriogenology*. 55: 1341-1357.
- Galli, C., G. Crotti, C. Notari, P. Turini, R. Duchi and G. Lazzari. 2001. Embryo production by ovum pick up from live donors. *Theriogenology*. 55: 1341-1357.
- Galli, C., R. Duchi, G. Crotti, P. Turini, N. Ponderato, S. Colleoni, I. Lagutina and G. Lazzari. 2003. Bovine embryo technologies. *Theriogenology*. 59: 599-616.
- Gandolfi, T.A. and F. Gandolfi. 2001. The maternal legacy to the embryo: cytoplasmic components and their effects on early development. *Theriogenology*. 55: 1255-1276.
- Gandolfi, F., T.A. Brevini, F. Cillo and S. Antonini. 2005. Cellular and molecular mechanisms regulating oocyte quality and the relevance for farm animal reproductive efficiency. *Revue Scientifique et Technique*. 24: 413-423.
- Gao, D.Y., J. Liu, L.E. McGann, P.E. Watson, F.W. Kleinhans, P. Mazur, E.S. Crister and J.K. Crister. 1995. Prevention of osmotic injury to human spermatozoa during addition and removal of glycerol. *Human Reproduction*. 10: 1109-1122.
- Gardner, D.K. 1994. Mammalian embryo culture in the absence of serum of somatic cell support. *Cell Biology International*. 18: 1163-1179.
- Gardner, D.K. 1998. Changes in requirements and utilization of nutrients during mammalian preimplantation embryo development and their significance in embryo culture. *Theriogenology*. 49: 83-102.
- Gasparrini, B. 2002. *In vitro* embryo production in buffalo species: state of the art. *Theriogenology*. 57: 237-256.
- Gasparrini, B., H. Sayond, G. Neglia, D.G. De Matos, I. Donny and L. Zicarelli. 2003. Glutathion synthesis during *in vitro* maturation of buffalo (*Bubalus bubalis*) oocytes: effects of cysteamine on embryo development. *Theriogenology*. 60: 943-952.
- Gasparrini, B., L. Boccia, A.D. Rosa, R.D. Palo, G. Campanile and L. Zicarelli. 2004. Chemical activation of buffalo (*Bubalus bubalis*) oocytes by different methods: effect of aging on post parthenogenic development. *Theriogenology*. 62: 1627-1637.

- Geshi, M., M. Yonai, M. Sakaguchi and T. Nagai. 1999. Improvement of *in vitro* co-culture systems for bovine embryos using a low concentration of carbon dioxide and medium supplemented with beta-mercaptoethanol. *Theriogenology*. 51: 551-558.
- Gianaroli, L., A. Fiorentino, M. Cristina Magli, A.P. Ferraretti and N. Montanaro. 1996a. Prolonged sperm oocyte exposure and high sperm concentration affect human embryo viability and pregnancy rate. *Human Reproduction*. 11: 2507-2511.
- Gianaroli, L., M.C. Magli, A.P. Ferraretti, A. Fiorentino, E. Tosti and S. Panzella. 1996b. Reducing the time of sperm-oocyte interaction in human *in vitro* fertilization improves the implantation rate. *Human Reproduction*. 11: 166-171.
- Gibbons, A., M.I. Cueto and F. Pereyra Bonnet. 2011. A simple vitrification technique for sheep and goat embryo cryopreservation. *Small Ruminant Research*. 95: 61-64.
- Gil, M.A., L.R. Abeydeera, B.N. Day, J.M. Vazquez, J. Roca and E.A. Martinez. 2003. Effect of the volume of medium and number of oocytes during *in vitro* fertilization in embryo development in pigs. *Theriogenology*. 60: 767-776.
- Gilchrist, R., M. Morrissey, L. Ritter and D. Armstrong. 2003. Comparison of oocyte factors and transforming growth factor-beta in the regulation of DNA synthesis in bovine granulosa cells. *Molecular Cell Endocrinology*. 201: 87-95.
- Gilula, N.B., M.L. Epstein and W.H. Beers. 1978. Cell to cell communication and ovulation. A study of the cumulus-oocyte complex. *Journal of Cell Biology*. 78: 58-75.
- Givens, M.D., P.K. Galik, K.P. Riddell, K.V. Brock and D.A. Stringfellow. 2000. Replication and persistence of different strains of bovine viral diarrhea virus in an *in vitro* embryo production system. *Theriogenology*. 54: 1093-1107.
- Givens, M.D., D.A. Stringfellow, K.P. Riddell, P.K. Galik, R.L. Carson, M.G. Riddell and C.B. Navarre. 2006. Normal calves produced after transfer of *in vitro* fertilized embryos cultured with an antiviral compound. *Theriogenology*. 65: 344-355.
- Goel, A.K. and K.P. Agrawal. 2005. Ovulatory response and embryo yield in Jakhrana goats following treatments with PMSG and FSH. *Tropical Animal Health Product*. 37: 549-558.
- Goovaerts, I.G.F., J.M.L.R. Leroy, A. Van Soom, J.B.P. De Clercq, S. Andries and P.E.J. Bols. 2009. Effect of cumulus cell coculture and oxygen tension on the *in vitro* developmental competence of bovine zygotes cultured singly. *Theriogenology*. 71: 729-738.
- Gordo, A.C., H. Wu, C.L. He and R.A. Fissore. 2000. Injection of sperm cytosolic factor into mouse MII oocytes induces different developmental fates according to the frequency of Ca²⁺ oscillations and oocyte age. *Biology of Reproduction*. 62: 1370-1379.
- Gordon, I. 1997. *Controlled Reproduction in Sheep and Goats*. 1st Edition, CAB International, London, UK. ISBN: 0851991157.
- Gordon, I. 2003. *Laboratory Production of Cattle Embryos*. 2nd Edition, CAB International, University Press, Cambridge. p.548.

- Gordon, I. and K.H. Lu. 1990. Production of embryos *in vitro* and its impact on livestock production. *Theriogenology*. 33: 77-87.
- Gorus, F.K. and D.G. Pipeleers. 1981. A rapid method for the fractionation of human spermatozoa according to their progressive motility. *Fertility and Sterility*. 35: 662-665.
- Goto, K., N. Jwai, Y. Takuma and Y. Nakanishi. 1992. Co-culture of *in vitro* fertilized bovine embryos with different cell monolayers. *Journal of Animal Science*. 70: 1449-1453.
- Greyling, J.P.C., C.H. van Nierkerk and J.A.N. Grobbelarr. 1985. Synchronization of oestrus in the Boer goat doe: The response to the use of intravaginal progestagen and PMSG. *South African Journal of Animal Science*. 15: 52-55.
- Greyling, J.P.C. and C.J.Van Nierkerk. 1990. Effect of pregnant mare serum gonadotrophin (PMSG) and route of administration after progestagen treatment on oestrus and LH secretion in the Boer goat. *Small Ruminant Research*. 3: 511-516.
- Greyling, J.P.C. and C.H. Van Nierkerk. 1990. Ovulation in the Boer goat doe. *Small Ruminant Research*. 3: 457-464.
- Gruppen, C.G., J.C. Mau, S.M. Mcikpatrick, S. Maddock and M.B. Nottle. 2002. Effect of 6-dimethylaminopurine on electrically activated *in vitro* matured porcine oocytes. *Molecular Reproduction and Development*. 62: 387-396.
- Guerin, J.F., C. Mathieu, J. Lomage, M.C. Pinatel and D. Bouliou. 1989. Improvement of survival and fertilizing capacity of human spermatozoa in an IVF programme by selection on discontinuous Percoll gradients. *Human Reproduction*. 4: 798-804.
- Guignot, F. 2005. Cryoconservation des embryos des espèces domestiques. *INRA Productions Animals*. 18: 27-35.
- Guignot, F., A. Bouttier, G. Baril, P. Salvetti, P. Pignon, J.F. Beckers, J.L. Touzé, J. Cognié, A.S. Traldi, Y. Cognié and P. Mermillod. 2006. Improved vitrification method allowing direct transfer of goat embryos. *Theriogenology*. 66: 1004-1011.
- Guler, A., N. Poulin, P. Mermillod, M. Terqui and Y. Cognié. 2000. Effect of growth factors. EGF and IGF-I and estradiol on *in vitro* maturation of sheep oocytes. *Theriogenology*. 59: 209-218.
- Gutierrez-Adan, A., J. Granados, J.J. Garde, M. Perez-Guzman, B. Pintado and J. De la Fuente. 1999. Relationship between sex ratio and time of insemination according to both time of ovulation and maturational state of oocyte. *Zygote*. 7: 37-43.
- Habsah, B. 2006. IVF performance of different qualities of oocyte using co-culture and chemically-defined medium in Malaysian cattle. PhD Thesis. University of Malaya. Kuala Lumpur, Malaysia.
- Habsah, B., W.E. Wan Khadijah, R.B. Abdullah and K. Musaddin. 2005. IVF performance of low quality oocytes harvested from Malaysia cattle. *Malaysian Journal of Animal Science*. 10 (2): 95-102.

- Hagemann, L.J., L.L. Weilert, S.E. Beaumont and H.R. Tervit. 1998. Development of bovine embryos in single *in vitro* production (sIVP) systems. *Molecular Reproduction and Development*. 51: 143-147.
- Hagemann, L.J., S.E. Beaumont, M. Berg, M.J. Donnison, A. Ledgard, A.J. Peterson, A. Schurmann and H.R. Tervit. 1999. Development during single IVP of bovine oocytes from dissected follicles: interactive effects of estrous cycle stage, follicle size and atresia. *Molecular Reproduction and Development*. 53: 451-458.
- Hall, J.G. 1990. Genomic imprinting: review and relevance to human diseases. *American Journal of Human Genetics*. 46: 857-873.
- Hallows, K.R. and P.A. Knauf. 1994. Principles of cell volume regulation. *Cellular and Molecular Physiology of Cell Volume Regulation*. pp. 3-29.
- Hamawaki, A., M. Kuwayama and S. Hamano. 1999. Minimum volume cooling method for bovine blastocyst vitrification. *Theriogenology*. 51: 165 (abstract).
- Han, Z., Y.G. Chung, S. Gao and K.E. Latham. 2005. Maternal factors controlling blastomere fragmentation in early mouse embryos. *Biology of Reproduction*. 72: 612-618.
- Han, Z.B., G.C. Lan, Y.G. Wu, D. Han, W.G. Feng, J.Z. Wang and J.H. Tan. 2006. Interactive effects of granulosa cell apoptosis, follicle size, cumulus–oocyte complex morphology, and cumulus expansion on the developmental competence of goat oocytes: a study using the well-in-drop culture system. *Reproduction*. 132: 749-758.
- Harada, M., T. Miyano, K. Matsumura, S. Osaka, M. Miyake and S. Kato. 1997. Bovine oocytes from early antral follicles grow to meiotic competence *in vitro*: effect of FSH and hypoxanthine. *Theriogenology*. 48: 743-755.
- Hardy, K. 1997. Cell death in the mammalian blastocyst. *Molecular Human Reproduction*. 3: 919-925.
- Harrison, R.A.P. 2004. Rapid PKA-catalysed phosphorylation of boar sperm proteins induced by the capacitating agent bicarbonate. *Molecular Reproduction and Development*. 67: 337-352.
- Harrison, R.A.P. and I.G. White. 1972. Some methods for washing spermatozoa from bull, boar and ram: a comparison using biochemical and other criteria. *Journal of Reproduction and Fertility*. 29: 271-284.
- Harrison, R.A.P. 1976. A highly efficient method for washing mammalian spermatozoa. *Journal of Reproduction and Fertility*. 48: 347-353.
- Harrison, R.A.P. and N.G.A. Miller. 2000. cAMP-dependent protein kinase control of plasma membrane lipid architecture in boar sperm. *Molecular Reproduction and Development*. 55: 220-228.
- Hashim, N.H. 1996. Cryopreservation of mouse embryos at different stages of development derived from *in vitro* and *in vivo* fertilisation using programmable freezer. MSc Thesis. University of Malaya. Kuala Lumpur, Malaysia.

- Hashimoto, S., N. Minami, R. Takakura, M. Yamada, H. Imai and N. Kashima. 2000. Low oxygen tension during *in vitro* maturation is beneficial for supporting the subsequent development of bovine cumulus-oocyte complexes. *Molecular Reproduction and Development*. 57: 353-360.
- Hasler, J.F. 1998. The current status of oocyte recovery, *in vitro* embryo production, and embryo transfer in domestic animals, with an emphasis on the bovine. *Journal of Animal Science*. 76: 52-74.
- Hasler, J.F. 2003. The current status and future of commercial embryo transfer in cattle. *Animal Reproduction Science*. 15: 245-264.
- Hasler, J.F., W.B. Henderson, P.J. Hurtgen, Z.Q. Jin, A.D. McCauley and S.A. Mower. 1995. Production freezing and transfer of bovine IVF embryos and subsequent calving results. *Theriogenology*. 43: 141-152.
- Hawk, H.W., N.D. Nel, R.A. Waterman and R.J. Wall. 1992. Investigation of means to improve rates of fertilization *in vitro* matured/*in vitro* fertilized bovine oocytes. *Theriogenology*. 38: 989-998.
- Hernandez-Ledezma, J.J., C. Villanueva, J.D. Sikes and R.M. Roberts. 1995. Comparison of co-culture and conditioned medium on expansion and batching of *in vitro*-derived bovine blastocysts. *Theriogenology*. 43: 233.
- Hernandez-Ledezma, J.J., C. Villanueva, J.D. Sikes and H.M. Kubisch. 1996. Increasing the rate of blastocyst formation and hatching from *in vitro* produced bovine zygotes. *Theriogenology*. 46: 961-969.
- Herve, V., F. Roy, J. Bertin, F. Guillou and M.C. Maurel. 2004. Antiequine chorionic gonadotropin (eCG) antibodies generated in goats treated with eCG for the induction of ovulation modulate the luteinizing hormone and follicle-stimulating hormone bioactivities of eCG differently. *Endocrinology*. 154: 294-303.
- Heyman, Y., Z. Smorag, L. Katska and C. Vincent. 1986. Influence of carbohydrates, cooling and rapid freezing on viability of bovine non-matured oocytes or 1-cell fertilized eggs. *Cryo-Letters*. 7: 170-183.
- Hickey, T., D. Marrocco, F. Amato, L. Ritter, R. Norman, R. Gilchrist and D. Armstrong. 2005. Androgens augment the mitogenic effects of oocyte-secreted factors and growth differentiation factor 9 on porcine granulosa cells. *Biology of Reproduction*. 73: 825-832.
- Hochi, S., H. Abdalla, H. Hara, M. Shimoda, H. Morita, M. Kuwayama and M. Hirabayashi. 2010. Stimulatory effect of Rho-associated coiled-coil kinases (ROCK) inhibitor on revivability of *in vitro*-produced bovine blastocysts after vitrification. *Theriogenology*. 73: 1139-1145.
- Holden, C.A. and A.O. Trounson. 1991. Trounson. Staining of the inner acrosomal membrane of human spermatozoa with concavalin A lectin as an indicator of potential egg penetration ability. *Fertility and Sterility*. 56: 967-974.

- Holm, P. and H. Callesen. 1998. *In vivo* versus *in vitro* produced bovine ova: similarities and differences relevant for practical application. *Reproduction, Nutrition, Development*. 38: 579-594.
- Holm, P., P.J. Booth, M.H. Schmidt, T. Greve and H. Callensen. 1999. High bovine blastocyst development in a static *in vitro* production system using SOFaa medium supplemented with sodium citrate and myo-inositol with or without serum proteins. *Theriogenology*. 52: 683-700.
- Holm, P., P.J. Booth and H. Callesen. 2003. Developmental kinetics of bovine nuclear transfer and parthenogenetic embryos. *Cloning Stem Cells*. 5: 133-142.
- Holtz, W. 2005. Recent developments in assisted reproduction in goats. *Small Ruminant Research*. 60: 95-110.
- Hong, Q.H., S.J. Tian, S.E. Zhu, J.Z. Feng, C.L. Yan, X.M. Zhao, G.S. Liu and S.M. Zheng. 2007. Vitrification of Boer goat morulae and early blastocysts by straw and open-pulled straw method. *Reproduction in Domestic Animals*. 42: 34-38.
- Hoshi, K., T. Sugano, C. Endo, N. Yoshimatu, K. Yanagida and A. Sato. 1993. Induction of the acrosome reaction in human sperm by the human zona pellucida and effect of cervical mucus on zona induced acrosome reaction. *Fertility and Sterility*. 60: 149-153.
- Hosseini, S.M., M. Hajian, F. Moulavi, A.H. Shahverdi and M.H. Nasr-Esfahani. 2008. Optimized combined electrical-chemical parthenogenetic activation for *in vitro* matured bovine oocytes. *Animal Reproduction Science*. 108: 122-133.
- Hsieh, R.H., H.K. Au, T.S. Yeh, S.J. Chang, Y.F. Cheng and C.R. Tzeng. 2004. Decreased expression of mitochondrial genes in human unfertilized oocytes and arrested embryos. *Fertility and Sterility*. 81: 912-918.
- Huang, J.C., H.H. Lin, J.S. Wu, P.H. Tang, D.G. Wang and B.T. Liu. 2006. Vitrification of caprine embryos in microdrops. *Symposium COA/INRA Scientific Cooperation in Agriculture*. Tainan, Taiwan. pp. 47-58.
- Hubel, A., E.G. Cravalho, B. Nunner and C. Körber. 1992. Survival of directionally solidified B-lymphoblasts under various crystal growth conditions. *Cryobiology*. 28: 183.
- Hunter, R.H.F. 1988. *The fallopian tubes: their role in fertility and infertility*. Springer-Verlag: Berlin.
- Hunter, R.H.F. and T. Greve. 1997. Could artificial insemination of cattle be more fruitful? Penalties associated with aging eggs. *Reproduction in Domestic Animals*. 32: 137-142.
- Hunter, R.H.F. 1999. Factors influencing sperm migration in the Fallopian tubes. *Reproduction in Domestic Animals*. 34 (3-4): 227-35.
- Hunter, R.H.F. 2002. Vital aspects of fallopian tube physiology in pigs. *Reproduction in Domestic Animals*. 37 (4): 186-190.

Hunter, R.H.F. 2008. Sperm release from oviduct epithelial binding is controlled hormonally by peri-ovulatory Graafian follicles. *Molecular Reproduction and Development*. 75 (1): 167-74.

Hunter, R.H.F., 1989. Aging of the unfertilized cow egg *in vivo*: how soon is fertility compromised. *Veterinary Record*. 124: 489-490.

Huo, L. and R.C. Scarpulla. 2001. Mitochondrial DNA instability and periimplantation lethality associated with targeted disruption of nuclear respiratory factor 1 in mice. *Molecular Cell Biology*. 21: 644-654.

Hurrt, A.E., F. Landim-Alvarenga, G.E. Seidel Jr. and E.L. Squires. 2000. Vitrification of immature and mature equine and bovine oocytes in an ethylene glycol, ficoll and sucrose solution using Open Pulled Straws. *Theriogenology*. 54: 119-129.

Hussein, T., D. Froiland, F. Amato, J. Thompson and R. Gilchrist. 2005. Oocytes prevent cumulus cell apoptosis by maintaining a morphogenic paracrine gradient of bone morphogenetic proteins. *Journal of Cell Science*. 118: 5257-5268.

Hussein, T., J. Thompson and R. Gilchrist. 2006. Oocyte-secreted factors enhance oocyte developmental competence. *Developmental Biology*. 296: 514-521.

Hyttel, P, T. Fair, H. Callensen and T. Greve. 1997. Oocyte growth, capacitation and final maturation in cattle. *Theriogenology*. 47: 23-32.

Ijaz, A., R.D. Lambert and M.A. Sirard. 1994. *In vitro*-cultured bovine granulosa and oviductal cells secrete sperm motility-maintaining factor(s). *Molecular Reproduction and Development*. 37: 54-60.

Im, G.S., L. Liangxue, L. Zhonghua, H. Yanhong, W. David, B. Aaron and S.P. Randall. 2003. *In vitro* development of preimplantation porcine nuclear transfer embryos cultured in different media and gas atmospheres. *Theriogenology*. 61: 1125-1135.

Iritani, A., K. Niwa and H. Imai. 1978. Sperm penetration *in vivo* of pig follicular oocytes matured in culture. *Journal Reproduction Fertility*. 54: 379-383.

Ishimori, H., Y. Takahashi and H. Kanagawa. 1992. Factors affecting survival of mouse blastocysts vitrified by a mixture of ethylene glycol and dimethyl sulfoxide. *Theriogenology*. 38: 1175-1185.

Ishimori, H., K. Saeki, M. Inai, Y. Nagao, J. Itasaka, Y. Miki, N. Seike and H. Kainuma. 1993. Vitrification of bovine embryos in a mixture of ethylene glycol and dimethyl sulfoxide. *Theriogenology*. 40: 427-433.

Itagaki, Y. and Y. Toyoda. 1991. Factors affecting fertilization *in vitro* of mouse eggs after removal of cumulus oophorus. *Journal of Mammal Ova Research*. 8: 126-134.

Iwamoto, M., A. Onishi, D. Fuchimoto, T. Somfai, K. Takeda, T. Tagami, H. Hanada, J. Noguchi, H. Kaneko, T. Nagai and K. Kikuchi. 2005. Low oxygen tension during *in vitro* maturation of porcine follicular oocytes improves parthenogenetic activation and subsequent development to the blastocyst stage. *Theriogenology*. 63: 1277-1289.

- Iwata, H., S. Akamatsu, N. Minami and M. Yamada. 1998. Effects of antioxidants on the development of bovine IVM/IVF embryos in various concentrations of glucose. *Theriogenology*. 50 (3): 365-375.
- Izadyar, F., H.T.A. Van Tol, B. Colenbrander and M.M. Bevers. 1997. Stimulatory effect of growth hormone on *in vitro* maturation of bovine oocytes is exerted through cumulus cells and not mediated by IGF-I. *Molecular Reproduction and Development*. 47: 175-180.
- Izquierdo, D., P. Villamediana and M.T. Paramio. 1999. Effect of culture media on embryo development from prepubertal goat IVM-IVF oocytes. *Theriogenology*. 52: 847-861.
- Izquierdo, D., P. Villamediana, M. Lopez-Bejar and M.T. Paramio. 2002. Effect of *in vitro* and *in vivo* culture on embryo development from prepubertal goat IVM-IVF oocytes. *Theriogenology*. 57: 1431-1441.
- Jaakma, U., B.R. Zhang, B. Larsson, K. Niwa and H. Rodriguez-Martinez. 1997. Effects of sperm treatments on the *in vitro* development of bovine oocytes in semi-defined and defined media. *Theriogenology*. 48: 711-720.
- Jacobsen, H., M. Schmidt, P. Holm, P.T. Sangild, G. Vajta, T. Greve and H. Callesen. 2000. Body dimensions and birth and organ weights of calves derived from *in vitro* produced embryos cultured with or without serum and oviduct epithelium cells. *Theriogenology*. 53: 1761-1769.
- Jellerette, T., D. Melican, R. Butler, S. Nims, C. Ziomek, R. Fissore and W. Gavin. 2006. Characterization of calcium oscillation patterns in caprine oocytes induced by IVF or an activation technique used in nuclear transfer. *Theriogenology*. 65: 1575-1586.
- Jilek, F., R. Huttelova, J. Petr, M. Holubova and J. Rozinek. 2001. Activation of pig oocytes using calcium ionophore: effect of protein kinase inhibitor 6-dimethylaminopurin. *Reproduction in Domestic Animals*. 36: 139-145.
- Jimenez-Macedo, A.R., M.T. Paramio, B. Anguita, R. Morato, R. Romaguera, T. Mogas and D. Izquierdo. 2007. Effect of ICSI and embryo biopsy on embryo development and apoptosis according to oocyte diameter in prepubertal goats. *Theriogenology*. 67: 1399-1408.
- John, R.M. and M.A. Surani. 1996. Imprinted genes and regulation of gene expression by epigenetic inheritance. *Current Opinion in Cell Biology*. 8: 348-353.
- Jonakova, V. and M. Ticha. 2004. Boar seminal plasma proteins and their binding properties. *Collection of Czechoslovak Chemical Communications*. 69: 461-475.
- Ju, J.C., L. Liu, S. Jiang, J.E. Parks. and X. Yang. 1997. Parthenogenetic activation of IVM-derived bovine oocytes. *Biology of Reproduction*. 56: 38.
- Juergen, L., N. Frank, I. Vladimir, I. Evgenia, R. Gohar and J.T. Michael. 2002. Potential importance of vitrification in reproductive medicine. *Biology of Reproduction*. 67: 1671-1680.

- Juriscova, A., K.E. Latham, R.F. Casper and S.L. Varmuza. 1998. Expression and regulation of genes associated with cell death during murine preimplantation embryo development. *Molecular Reproduction and Development*. 51: 243-253.
- Kaaekuahiwi, M.A., Jr. A.R. Menino. 1990. Relationship between plasminogen activator production and bovine embryos development *in vitro*. *Journal of Animal Science*. 68: 2009-2014.
- Kafi, M., M.R. McGowan and P.D. Kirkland. 2002. *In vitro* maturation and fertilization of bovine oocytes and *in vitro* culture of presumptive zygotes in the presence of bovine pestivirus. *Animal Reproduction Science*. 71: 169-179.
- Kane, M.T., E.W. Carney and J.E. Ellington. 1992. The role of nutrients, peptide growth factors and coculture cells in development of preimplantation embryos *in vitro*. *Theriogenology*. 38: 297-313.
- Karaca, F., I. Tasal and M. Alan. 2009. Preliminary report on induction of estrus with multiple eCG injections in Colored Mohair goats during the anestrus season. *Animal Reproduction Science*. 114: 306-310.
- Karatzas, G., A. Karagiannidis, S. Varsakeli and P. Brikas. 1997. Fertility of fresh and frozen-thawed goat semen during the nonbreeding season. *Theriogenology*. 48: 1049-1059.
- Karow, A.M. 1981. Biophysical and chemical considerations in cryopreservation. *In: Organ Preservation for Transplantation*. *Editors: A.M. Karow and D.E. Pegg*. Dekker. New York. p. 113.
- Kasai, M. 1996. Simple and efficient methods for vitrification of mammalian embryos. *Animal Reproduction Science*. 42: 67-75.
- Kasai, M. 2002. Advances in the cryopreservation of mammalian oocytes and embryos: development of ultrarapid vitrification. *Reproductive Medicine and Biology*. 1: 1-9.
- Kasai, M. and T. Mukaida. 2004. Cryopreservation of animal and human embryos by vitrification. *Reproductive Biomedicine Online*. 9: 164-170.
- Katska, L., P. Kauffold, Z. Smorag, V. Duschinski, H. Torner and W. Kanitz. 1989. Influence of hardening of the zona pellucida on *in vitro* fertilization of bovine oocytes. *Theriogenology*. 32: 767-777.
- Katska-Ksiazkiewicz, L., B. Rynska and Z. Smorag. Effect of seminal plasma on the *in vitro* fertilizability of bull spermatozoa. 1996. *Animal Reproduction Science*. 44: 23-31.
- Katska-Ksiazkiewicz, L., B. Rynska, B. Gajda and Z. Smorag. 2004. Effect of donor stimulation, frozen semen and heparin treatment on the efficiency of *in vitro* embryo production in goats. *Theriogenology*. 62: 576-586.
- Katska-Ksiazkiewicz, L., M. Bochenek and B. Rynska. 2005. Effect of quality of sperm chromatin structure on *in-vitro* production of cattle embryos. *Arch Tierz Dummerstorf*. 48: 32-39.

- Katska-Ksiazkiewicz, L., B. Rynska, M. Bochenek, J. Opiela, J. Jurkiewicz. 2006. *In vitro* production of bovine embryos using flow-cytometrically sexed sperm. *Arch Tierz Dummerstorf*. 49: 133-140.
- Katska-Ksiazkiewicz, L., J. Opiela and B. Rynska. 2007. Effects of oocyte quality, semen donor and embryo co-culture system on the efficiency of blastocyst production in goats. *Theriogenology*. 68: 736-744.
- Kattera, S. and C. Chen. 2003. Short coincubation of gametes in *in vitro* fertilization improves implantation and pregnancy rates: a prospective, randomized, controlled study. *Fertility and Sterility*. 80: 1017-1021.
- Kauffold, J., A.H. Amer, U. Bergfeld, W. Weber and A. Sobiraj. 2005. The *in vitro* developmental competence of oocytes from juvenile calves is related to follicular diameter. *Journal of Reproduction and Development*. 51: 325-332.
- Kawarsky, S.J., P.K. Basrur, R.B. Stubbings, P.J. Hansen and W.A. King. 1996. Chromosomal abnormalities in bovine embryo and their influence on development. *Biology of Reproduction*. 43: 53-59.
- Keefer, C.L., B.G. Brackett and C.G. Troop. 1985. Bovine fertilization after *in vitro* insemination with motile sperm fraction. *Theriogenology*. 23: 198 (abstract).
- Keskintepe, L., G. Darwish, M. Paramio and B.G. Brackett. 1993. Caprine oocyte fertilization and development *in vitro*. *Biology of Reproduction*. 41: 451 (abstract).
- Keskintepe, L., G.M. Darwish, A.T. Kenimer and B.G. Brackett. 1994a. Term development of caprine embryos derived from immature oocytes *in vitro*. *Theriogenology*. 42: 527-535.
- Keskintepe, L., G.M. Darwish, A.J. Younis and B.G. Brackett. 1994b. *In vitro* development of morulae from immature caprine oocytes. *Zygote*. 2: 97-102.
- Keskintepe, L., G.C. Luvoni, M.M. Bassiony and B.G. Brackett. 1996. Procedural improvements for *in vitro* production of viable uterine stage caprine embryos. *Small Ruminant Research*. 20: 247-254.
- Keskintepe, L., A.A. Simplicio, B.G. Brackett. 1998. Caprine blastocyst development after *in vitro* fertilization with spermatozoa frozen in different extenders. *Theriogenology*. 49: 1265-1274.
- Kharche, S.D., A.K. Goel, S.K. Jindal, E.N. Yadav, P. Yadav, R. Sinha and N.K. Sinha. 2009. Effect of serum albumin supplementation on *in vitro* capacitation and fertilization of caprine oocytes. *Small Ruminant Research*. 81: 85-89.
- Khatir, H., A. Anouassi and A. Tibary. 2009. *In vitro* and *in vivo* developmental competence of dromedary (*Camelus dromedarius*) oocytes following *in vitro* fertilization or parthenogenetic activation. *Animal Reproduction Science*. 113: 212-219.
- Khurana, N.K. and H. Niemann. 2000. Effects of oocyte quality, oxygen tension, embryo density, cumulus cells and energy substrates on cleavage and morula/blastocyst formation on bovine embryos. *Theriogenology*. 54: 741-756.

- Kikuchi, K., T. Nagai, J. Motlik, Y. Shioya and Y. Izakie. 1993. Effect of follicle cells on *in vitro* fertilization of pig follicular oocytes. *Theriogenology*. 39: 593-599.
- Kim, N.H., C. Simerly, H. Funahashi, G. Schatten and B.N. Day. 1996. Microtubule organization in porcine oocytes during fertilization and parthenogenesis. *Biology of Reproduction*. 54: 1397-1404.
- Kim, H.S., G.S. Lee, S.H. Hyun, S.H. Lee, D.H. Nam, Y.W. Jeong, S. Kim, S.K. Kang, B.C. Lee and W.S. Hwang. 2004. Improved *in vitro* development of porcine embryos with different energy substrates and serum. *Theriogenology*. 61 (7-8): 1381-1393.
- King, W.A., A.V. Supplizi, H. Diop and D. Bousquet. 1995. Chromosomal analysis of embryos produced by artificially inseminated superovulated cattle. *Genetics Selection*. 27: 189-194.
- Kitiyant, Y., J. Saikhun, K. Pavasuthipaisit and M. Jaruansuwan. 2003. Parthenogenetic development of buffalo oocytes after electrical and chemical activation. *Theriogenology*. 59: 475.
- Kligman, I., M. Glassner, B.T. Storey and G.S. Kopf. 1991. ZP-mediated acrosomal exocytosis in mouse spermatozoa: Characterization of an intermediate stage prior to the completion of the acrosome reaction. *Developmental Biology*. 145: 344-355.
- Kline, D. and J.T. Kline. 1992. Repetitive calcium transients and the role of calcium in exocytosis and cell cycle activation in the mouse egg. *Developmental Biology*. 149: 80-89.
- Koeman, J., C.L. Keefer, H. Baldassarre and B.R. Downey. 2003. Developmental competence of prepubertal and adult goat oocytes cultured in semi-defined media following laparoscopic recovery. *Theriogenology*. 60: 879-889.
- Kolbe, T. and W. Holtz. 2005. Differences in proteinase digestibility of the zona pellucida of *in vivo* and *in vitro* derived porcine oocytes and embryos. *Theriogenology*. 63: 1695-1705.
- Kong, S.C. 2010. *In vitro* production of caprine embryos through intracytoplasmic sperm injection (ICSI) technique. MSc Thesis. University of Malaya. Kuala Lumpur, Malaysia.
- Konishi, M., Y. Aoyagi, T. Takedomi, H. Itakura, T. Itoh and S. Yazawa. 1996. Presence of granulosa cells during oocyte maturation improved *in vitro* development of IVM-IVF bovine oocytes that were collected by ultrasound-guided transvaginal aspiration. *Theriogenology*. 45: 573-581.
- Koo, D.B., J.I. Chae, J.S. Kim, G. Wee, B.S. Song, K.K. Lee and Y.M. Han. 2005. Inactivation of MPF and PAP kinase by single electrical stimulus for parthenogenetic development of porcine oocytes. *Molecular Reproduction and Development*. 72: 542-549.
- Krisher, R.L. 2004. The effect of oocyte quality on development. *Journal of Animal Science*. 82: 14-23.

- Krisher, R.L., F.C. Gwazdauskas, R.L. Page, C.G. Russell, R.S. Canseco, A.E.T. Sparks, W.H. Velander, J.L. Johnson and R.E. Pearson. 1994. Ovulation rate, zygote recovery and follicular populations in FSH- superovulated goats treated with PGF2 and/or GnRH. *Theriogenology*. 41: 491-498.
- Kruip, T.A. and S.J. Dieleman. 1982. Macroscopic classification of bovine follicles and its validation by micromorphological and steroid biochemical procedures. *Reproduction, Nutrition, Development*. 22: 465-473.
- Kubiak, J.Z. 1989. Mouse oocytes gradually develop the capacity for activation during the metaphase II arrest. *Developmental Biology*. 136 (2): 537-545.
- Kuleshova, L., D. MacFarlane, A. Trounson and J. Shaw. 1999. Sugars exert major influence on the vitrification properties of ethylene glycol-based solutions and have low toxicity to embryos and oocytes. *Cryobiology*. 38: 119-130.
- Kumar, J., J.C. Osborn and A.W.N. Cameron. 1991. Luteinizing hormone and follicle stimulating hormone induce premature condensation of chromatin in goat (*Capra hircus*) oocytes. *Reproduction, Fertility and Development*. 3: 585-591.
- Kuran, M., J.J. Robinson, M.E. Staines and T.G. McEvoy. 2001. Development and de novo protein synthetic activity and bovine produced *in vitro* in different culture systems. *Theriogenology*. 55: 593-606.
- Kusina, N.T., F. Tarwirei, H. Hamudikuwanda, G. Agumba and J. Mukwena. 2000. A comparison of the effects of progesterone sponges and ear implants, PGF2alpha, and their combination on efficacy of estrus synchronization and fertility of Mashona goat does. *Theriogenology*. 53: 1567-1580.
- Kusina, N.T., T. Chinuwo, H. Hamudikuwanda, L.R. Ndlovu and S. Muzanenhano. 2001. Effect of different dietary energy level intakes on efficiency of estrus synchronization and fertility in Mashona goat does. *Small Ruminant Research*. 39: 283-288.
- Kusunoki, H., T. Yasu, S. Kato and S. Kand. 1984. Identification of acrosome-reacted goat spermatozoa by a simplified triple-stain technique. *Japanese Journal of Zootechnology Science*. 55: 832-837.
- Kusunoki, H., M. Sakakue, S. Kato and S. Kauda. 1988. Induction of the acrosome reaction in ejaculated goat and boar spermatozoa by preincubation in isolated rat uterus and elucidation of possible inducing factor(s). *Japanese Journal of Animal Reproduction*. 34: 225- 236.
- Kuwayama, M. and O. Kato. 2000. All-round vitrification method for human oocytes and embryos. *Journal of Assisted Reproduction and Genetics*. 17: 477.
- Kuwayama, M., G. Vajta, O. Kato and S. Leibo. 2005a. Highly efficient vitrification method for cryopreservation of human oocytes. *Reproductive BioMedicine*. 11: 300-308.
- Kuwayama, M., G. Vajta, S. Ieda and O. Kato. 2005b. Vitrification of human embryos using the CryoTipTM method. *Reproductive BioMedicine Online*. 11: 608-614.

- Kuwayama, M. 2007. Highly efficient vitrification for cryopreservation of human oocytes and embryos: The Cryotop method. *Theriogenology*. 67: 73-80.
- Lai, Y.M., M.Y. Chang, F.H. Chang, C.L. Lee, J.D. Lee, S.Y. Chang, H.Y. Huang, M.L. Wang, P.J. Chan and Y.K. Soong. 1996. The effects of Vero cell co-culture on human zygotes resulting from *in vitro* fertilization and oocytes following subzonal insemination. *Changeng Yi Xue Za Zhi*. 19: 203-210.
- Lamara, A., F. Fieni, L. Mselli-Lakhal, D. Tainturier and Y. Chebloune. 2002. Epithelial cells from goat oviduct are highly permissive for productive infection with caprine arthritis-encephalitis virus (CAEV). *Virus Research*. 87: 69-77.
- Lan, G.C., D. Han, Y.G. Wu, Z.B. Han, S.F. Ma, X.Y. Liu, C.L. Chang and J.H. Tan. 2005. Effects of duration, concentration, and timing of ionomycin and 6-dimethylaminopurine (6-DMAP) treatment on activation of goat oocytes. *Molecular Reproduction and Development*. 71: 380-388.
- Lane, M. and D.K. Gardner. 1997. Differential regulation of mouse embryo development and viability by amino acids. *Journal of Reproduction and Fertility*. 109: 153-164.
- Lane, M., W.B. Schoolcraft and D.K. Gardner. 1999. Vitrification of mouse and human blastocysts using a novel cryoloop container-less technique. *Fertility and Sterility*. 72: 1073-1078.
- Lane, M. and D.K. Gardner. 2003. Use of G1.2/G2.2 media for commercial bovine embryo culture: equivalent development and pregnancy rates compared to co-culture. *Theriogenology*. 60: 407-419.
- Lang, F., G.L. Busch, H. Völkl and D. Häussinger. 1995. Cell volume: a second message in regulation of cell function. *News in Physiological Science*. 10: 18-22.
- Larsson, N.G., J. Wang, H. Wilhelmsson, A. Oldfors, P. Rustin, M. Lewandoski, G.S. Barsh and D.A. Clayton. 1998. Mitochondrial transcription factor A is necessary for mtDNA maintenance and embryogenesis in mice. *Nature Review Genetics*. 18: 231-236.
- Lazzari, G., R. Duchi, G. Crotti, P. Turini, C. Notari and C. Galli. 2000. Effect of *in vitro* culture in SOF-BSA versus SOF-serum on the development of IVM-IVF bovine embryos up to day 12. In: *Proceeding of 16th Meeting AETE*. pp. 176 (abstract).
- Le Gal, F., G. Baril, J.C. Vallet and B. Leboeuf. 1993. *In vivo* and *in vitro* survival of goat embryos after freezing with ethylene glycol or glycerol. *Theriogenology*. 40: 771-777.
- Le Gal, F. and A. Massip. 1999. Cryopreservation of cattle oocytes: Effects of meiotic stage, cycloheximide treatment and vitrification procedure. *Cryobiology*. 38: 290-300.
- Leal, C.L. and L. Liu. 1998. Differential effects of kinase inhibitor and electrical stimulus on activation and histone H1 kinase activity in pig oocytes. *Animal Reproduction Science*. 52: 51-61.

- Lee, K.S., B.S. Joo, Y.J. Na, M.S. Yoon, O.H. Choi and W.W. Kim. 2001. Cumulus cells apoptosis as an indicator to predict the quality of oocytes and the outcome of IVF-ET. *Journal of Assisted Reproduction and Genetics*. 18: 490-498.
- Legendre, L.M. and J. Stewart-Savage. 1993. Effect of cumulus maturity on sperm penetration in the golden hamster. *Biology of Reproduction*. 49: 82-88.
- Lehloenya, K.C. and J.P.C. Greyling. 2009. Effect of route of superovulatory gonadotrophin administration on the embryo recovery rate of Boer goat does. *Small Ruminant Research*. 87: 39-44.
- Leibfried-Rutledge, M.L., E.S. Critser, J.J. Parrish and N.L. First. 1989. *In vitro* maturation and fertilization of bovine oocytes. *Theriogenology*. 31: 61-74.
- Leibo, S.P. 1986. Cryobiology: Preservation of mammalian embryos. *Basic Life Sciences*. 37: 251-272.
- Leibo, S.P. 2004. Cryopreservation of mammalian oocytes. *In: Preservation of Fertility. Editors: T.Tulandi and R.G. Gosden. Taylor and Francis. London. pp. 141-155.*
- Leibo, S.P. and K. Oda. 1993. High survival of mouse zygotes and embryos cooled rapidly or slowly in ethylene glycol plus polyvinylpyrrolidone. *Cryo-Letters*. 14: 133-144.
- Leibo, S.P. and N.M. Loskutoff. 1993. Cryobiology of *in vitro* derived bovine embryos. *Theriogenology*. 39: 81-94.
- Leibo, S.P., A. Martino, S. Kobayashi and J.W. Pollard. 1996. Stage dependent sensitivity of oocytes and embryos to low temperatures. *Animal Reproduction Science*. 42: 43-53.
- Leibo, S.P. and N. Songsasen. 2002. Cryopreservation of gametes and embryos of non-domestic animals. *Theriogenology*. 57: 303-326.
- Leivas, F.G., D.S. Brum, S.S. Fialho, W.P. Saliba, M.T.T. Alvim, M.L. Bernardi, M.I.B. Rubin and C.A.M. Silva. 2011. Fetal calf serum enhances *in vitro* production of *Bos taurus indicus* embryos. *Theriogenology*. 75: 429-433.
- Lenz, R.W., R.L. Ax, H.J. Grimek and N.L. First. 1982. Proteoglycan from bovine follicular fluid enhances an acrosome reaction in bovine spermatozoa. *Biochemistry and Biophysical Research Communications*. 106: 1092-1098.
- Leoni, G., F. Berlinguer, I. Rosati and L. Bogliolo. 2002. Resumption of metabolic activity of vitrified/warmed ovine embryos. *Molecular Reproduction and Development*. 64: 207-213.
- Lequarre, A.S., C. Vigneron, F. Ribaucour, P. Holm, I. Donnay, R. Dalbies-Tran, H. Callesen and P. Mermillod. 2005. Influence of antral follicle size on oocyte characteristics and embryo development in the bovine. *Theriogenology*. 63: 841-859.

- Li, R., W.N. Cameron, P.A. Batt and A.O. Trounson. 1990. Maximum survival of frozen goat embryos is attained at the expanded, hatching and hatched blastocyst stages of development. *Reproduction, Fertility and Development*. 2: 345-350.
- Li, R., R. Norman, D. Armstrong and R. Gilchrist. 2000. Oocyte-secreted factor(s) determine functional differences between bovine mural granulosa cells and cumulus cells. *Biology of Reproduction*. 63: 839-845.
- Li, Z., Q. Jiang, M. Rezaei Sabet, Y. Zhang, T.C. Ritchie and J.F. Engelhardt. 2002. Conditions for *in vitro* maturation and artificial activation of ferret oocytes. *Biology of Reproduction*. 66: 1380-1386.
- Li, R., L. Wen, S. Wang and S. Bou. 2006. Development, freezability and amino acid consumption of bovine embryos cultured in synthetic oviductal fluid (SOF) medium containing amino acids at oviductal or uterine-fluid concentrations. *Theriogenology*. 66: 404-414.
- Li, Q., L.J. McKenzie and M.M. Matzuk. 2008. Revisiting oocyte-somatic cell interactions: in search of novel intrafollicular predictors and regulators of oocyte developmental competence. *Molecular Human Reproduction*. 14: 673-678.
- Li, H., D. Liu, M. Cang, L. Wang, M. Jin, Y. Ma and B. Shorgan. 2009. Early apoptosis is associated with improved developmental potential in bovine oocytes. *Animal Reproduction Science*. 114: 89-98.
- Lim, J.M. and W. Hansel. 1996. Roles of growth factors in the development of bovine embryos fertilized *in vitro* and cultured singly in a defined medium. *Reproduction, Fertility and Development*. 8: 1199-1205.
- Lim, J.M., B.C. Reggio, R.A. Godke and W. Hansel. 1997. Perifusion culture system for bovine embryos: improvement of embryo development by use of bovine oviduct epithelial cells, an antioxidant and polyvinyl alcohol. *Reproduction, Fertility and Development*. 9: 411-418.
- Lim, J.M., Y. Mei, B. Chen, R.A. Godke and W. Hansel. 1999. Development of bovine IVF oocytes cultured in medium supplemented with a nitric oxide scavenger or inhibitor in a co-culture system. *Theriogenology*. 51: 941-949.
- Lim, K., B. Lee, S. Kang and H. Hwang. 2003. Effects of protein source and energy substrates on the *in vitro* development of bovine embryos in a two-step culture system. *Journal of Veterinary Science*. 41: 73-78.
- Lima, P.F., M.A. Oliveira, P.B. Goncalves, M.M. Montagner, H.D. Reichenbach, M. Weppert, C.C.C. Neto, V.M.R. Pina and M.H.B. Santos. 2004. Effects of retinol on the *in vitro* development of *Bos indicus* embryos to blastocysts in two different culture systems. *Reproduction in Domestic Animals*. 39: 356-360.
- Litvin, T.N., M. Kamenetsky, A. Zarifyan, J. Buck and L.R. Levin. 2003. Kinetic properties of "soluble" adenylyl cyclase. Synergism between calcium and bicarbonate. *Journal of Biological Chemistry*. 278: 15922-15926.

- Liu, Z. and R.H. Foote. 1995. Effects of amino acids on the development of *in vitro* matured/*in vitro* fertilization bovine embryos in a simple protein-free medium. *Human Reproduction*. 10: 2985-2991.
- Liu, L. and X. Yang. 1999. Interplay of maturation promoting factor and mitogen activating protein kinase inactivation during metaphase to interphase transition of activated bovine oocytes. *Biology of Reproduction*. 61: 1-7.
- Liu, Y., G.R. Holyoak, S. Wang and T.D. Bunch. 1995. The importance of cumulus cells on the *in vitro* production of bovine oocytes. *Theriogenology*. 43: 267 (abstract).
- Liu, Z., R.H. Foote and M.E. Simkin. 1996. Effect of amino acids and alpha-amanitin on the development of rabbit embryos in modified protein-free KSOM with HEPES. *Molecular Reproduction and Development*. 45: 157-162.
- Liu, L., J. Ju and X. Yang. 1998a. Parthenogenetic development and protein patterns of newly matured bovine oocytes after chemical activation. *Molecular Reproduction and Development*. 49: 298-307.
- Liu, L., J.C. Ju and X. Yang. 1998b. Differential inactivation of maturation-promoting factor and mitogen-activated protein kinase following parthenogenetic activation of bovine oocytes. *Biology of Reproduction*. 59: 537-545.
- Liu, H., Z. He, C. Mele, L. Veeck, O. Davis and Z. Rosenwaks. 2000. Expression of apoptosis related genes in human oocytes and embryos. *Journal of Assisted Reproduction Genetic*. 17: 521-533.
- Liu, C.T., C.H. Chen, S.P. Cheng and J.C. Ju. 2002a. Parthenogenesis of rabbit oocytes activated by different stimuli. *Animal Reproduction Science*. 70: 267-276.
- Liu, L., J.R. Trimarchi and D.L. Keefe. 2002b. Haploidy but not parthenogenetic activation leads to increased incidence of apoptosis in mouse embryos. *Biology of Reproduction*. 66: 204-210.
- Liu, S.Z., M.X. Jiang, L.Y. Yan, Y.C. Ouyang, Q.Y. Sun and D.Y. Chen. 2005. Parthenogenetic and nuclear transfer rabbit embryo development and apoptosis after activation treatments. *Molecular Reproduction and Development*. 72: 48-53.
- Liu, J., M. Westhsin, C. Long, G. Johnson, R. Burghardt and D. Kraemer. 2010. Embryo production and possible species preservation by nuclear transfer of somatic cells isolated from bovine semen. *Theriogenology*. 74: 1629-1635.
- Lonergan, P., P. Monaghan, D. Rizos, M.P. Boland and I. Gordon. 1994. Effect of follicle size on bovine oocyte quality and developmental competence following maturation, fertilization, and culture *in vitro*. *Molecular Reproduction and Development*. 37: 48-53.
- Lonergan, P., D. Rizos, F. Ward and M.P. Boland. 2001. Factors influencing oocyte and embryo quality in cattle. *Reproduction, Nutrition, Development*. 41: 427-437.
- Long, C.R., C.N. Chase, J.J. Balise, R.T. Duby and J.M. Robl. 1993. Effect of sperm removal time, sperm concentration and motility enhancer on fertilization parameters and development of bovine embryos *in vitro*. *Theriogenology*. 39: 261 (abstract).

- Long, C.R., J.R. Dobrinsky and L.A. Johnson. 1999. *In vitro* production of pig embryos: comparisons of culture media and boars. *Theriogenology*. 51 (7): 1375-1390.
- Lorca, T., F.H. Cruzalegui, D. Fesquest, J.C. Cavadore, J. Mery, A. Means and M. Doree. 1993. Calmodulin-dependent protein kinase II mediates inactivation of MPF and CSF upon fertilization of *Xenopus* eggs. *Nature*. 366: 270-273.
- Loren, J. and O. Lacham-Kaplan. 2006. The employment of strontium to activate mouse oocytes: effects on spermatid-injection outcome. *Reproduction*. 131: 259-267.
- Luciano, A.M., S. Modina, R. Vassena, E. Milanesi, A. Lauria and F. Gandolfi. 2004. Role of intracellular cyclic adenosine 3', 5'-monophosphate concentration and oocyte-cumulus cells communications on the acquisition of the developmental competence during *in vitro* maturation of bovine oocyte. *Biology of Reproduction*. 70 (2): 465-472.
- Luvoni, G.C., L. Keskinetepe and B.G. Brackett. 1996. Improvement in bovine embryo production *in vitro* by glutathione-containing culture media. *Molecular Reproduction and Development*. 43: 437-443.
- Luyet, B.J. 1937. The vitrification of organic colloids and of protoplasm. *Biodynamical*. 29: 1-14.
- Luyet, B.J. and G. Rapatz. 1970. A review of basic research on the cryopreservation of red blood cells. *Cryobiology*. 6: 425-481.
- Ma, S.F., X.Y. Liu, D.Q. Miao, Z.B. Han, X. Zhang, Y.L. Miao, R. Yanagimachi and J.H. Tan. 2005. Parthenogenetic activation of mouse oocytes by strontium chloride: a search for the best conditions. *Theriogenology*. 64: 1142-1157.
- Mac Lean, R.A., H. Swanson Jr, J. Hancock, E. O'Brien, K.R. Williams, N.M. Loskutoff. 1998. Comparison of three techniques for separating motile sperm in cryopreserved *Bos gaurus* semen. *Theriogenology*. 49: 263 (abstract).
- Machaty, Z. and R.S. Prather. 1998. Strategies for activating nuclear transfer oocytes. *Reproduction, Fertility and Development*. 10: 599-613.
- Magalhães, D.M., A.B.G. Duarte, V.R. Araújo, I.R. Brito, T.G. Soares, I.M.T. Lima, C.A.P. Lopes, C.C. Campello, A.P.R. Rodrigues and J.R. Figueiredo. 2011. *In vitro* production of a caprine embryo from a preantral follicle cultured in media supplemented with growth hormone. *Theriogenology*. 75: 182-188.
- Magier, S., H.H. Van der Ven, K. Diedrich and D. Krebs. 1990. Significance of cumulus oophorus *in vivo* fertilization and oocyte viability and fertility. *Human Reproduction*. 5: 847-852.
- Mahmood, S., G.L. Koul and J.C. Biswas. 1991. Comparative efficacy of FSH-P and PMSG on superovulation in Pashmina goats. *Theriogenology*. 35: 1191-1196.
- Malik, R.K., I.S. Lohan, O.P. Dhanda, O.K. Hooda and S. Singh. 1999. Peritoneal fluid from rabbits or goats as media for *in vitro* maturation, fertilization and initial culture of caprine oocytes. *Animal Reproduction Science*. 54: 195-201.

- Marcus, S.F. and P.R. Brinsden. 1996. *In-vitro* fertilization and embryo transfer in women aged 40 years and over. *Human Reproduction Update*. 2: 459-468.
- Marston, J.H. and M.C. Chang. 1964. The fertilizable life of ova and their morphology following delayed insemination in mature and immature mice. *Journal of Experimental Zoology*. 15: 237-251.
- Martino, A., T. Mogas, M.J. Palomo and M.T. Paramio. 1993. Effect of oocyte and granulosa cell source used during *in vitro* maturation on *in vitro* fertilization of goat oocytes. *Theriogenology*. 39: 265 (abstract).
- Martino, A., T. Mogas, M. Palomo and M. Paramio. 1994a. Meiotic competence of prepubertal goats. *Theriogenology*. 41: 969-980.
- Martino, A., M.J. Palomo, T. Mogas, M.T. Paramio. 1994b. Influence of the collection technique of prepubertal goat oocytes on *in vitro* maturation and fertilization. *Theriogenology*. 42: 859-873.
- Martino, A., N. Songsasen and S.P. Leibo. 1996. Development into blastocysts of bovine oocytes cryopreserved by ultra-rapid cooling. *Biology of Reproduction*. 54: 1059-1069.
- Mason, I.L. 1981. Breeds. *In: Goat Production*. *Editor: C. Gall*. Academic Press. New York, pp. 57-110.
- Massip, A. 2001. Cryopreservation of embryos of farm animals. *Reproduction in Domestic Animals*. 36: 49-55.
- Massip, A., P. Mermillod, A. Van Langendonck, J.L. Touze and F. Dessy. 1995. Survival and viability of fresh and frozen-thawed *in vitro* bovine blastocysts. *Reproduction, Nutrition, Development*. 35: 3-10.
- Mattioli, M., G. Galeati and E. Seren. 1988. Effect of follicle somatic cells during pig oocyte maturation on egg penetrability and male pronucleus formation. *Gamete Research*. 20: 177-183.
- May-Panloup, P., X. Vignon, M.F. Chretien, Y. Heyman, M. Tamassia, Y. Malthiery and P. Reynier. 2005. Increase of mitochondrial DNA content and transcripts in early bovine embryogenesis associated with upregulation of mtTFA and NRF1 transcription factors. *Reproductive Biology and Endocrinology*. 3: 65-72.
- Mazur, P. 1988. Stopping biological time. The freezing of living cells. *Annual New York Academy of Science*. 541: 514-531.
- Mazur, P., N. Rigopoulos, S.C. Jackowsky and S.P. Leibo. 1976. Preliminary estimates of permeability of mouse ova and early embryos to glycerol. *Biophysical Journal*. 16: 232 (abstract).
- Mazur, P. and U. Schneider. 1984. Osmotic consequences of cryoprotectant permeability and its relation to the survival of frozen-thawed embryos. *Theriogenology*. 21: 68-79.

- McWilliams, R.B., W.E. Gibbons and S.P. Leibo. 1995. Osmotic and physiological responses of mouse zygotes and human oocytes to monoand disaccharides. *Human Reproduction*. 10: 1163-1171.
- Medan, M.S., G. Watanabe, K. Sasaki, S. Sharawy and N.P. Groome and K. Taya. 2003. Ovarian dynamics and their associations with peripheral concentrations of gonadotrophins, ovarian steroids, and inhibin during the estrous cycle in goats. *Biology of Reproduction*. 69: 57-63.
- Mehl, P. and P. Boutron. 1988. Cryoprotection of red blood cells by 1,3 butanediol and 2,3 butanediol. *Cryobiology*. 25: 44-54.
- Mehta, T.S. and A.E. Kiessling. 1993. The developmental potential of mouse embryos conceived in Ham's F-10 medium containing ethylenediaminetetraacetic acid. *Fertility and Sterility*. 60: 1088-1093.
- Meister, A. 1983. Selective modification of glutathione metabolism. *Science*. 220: 472-477.
- Mendes, Jr. J.O.B., P.D. Burns, J.F. De La Torre-Sanchez and Jr.G.E. Seidel. 2003. Effect of heparin on cleavage rates and embryo production with four bovine sperm preparation protocols. *Theriogenology*. 60: 331-340.
- Menegatos, J., S. Chadio, G. Karatzas and E. Stoforos. 1995. Progesterone levels throughout progestagen treatment influence the establishment of pregnancy in the goat. *Theriogenology*. 43: 1365-1370.
- Menino, Jr. A.R. and J.S. Williams. 1987. Activation of plasminogen by the early bovine embryos. *Biology of Reproduction*. 36: 1289-1295.
- Méo, S.C., C.L.V. Leal and J.M. Garcia. 2004. Activation and early parthenogenesis of bovine oocytes treated with ethanol and strontium. *Animal Reproduction Science*. 81: 35-46.
- Méo, S.C., W. Yamazaki, C.L.V. Leal, J.A. de Oliveira and J.M. Garcia. 2005. Use of strontium for bovine oocyte activation. *Theriogenology*. 63: 2089-2102.
- Mermillod, P., Vansteenbrugge, A., C. Wils, J.L. Mourmeaux, A. Massip and F. Dessy. 1993. Characterization of the embryotrophic activity of exogenous protein-free oviduct conditioned medium used in culture of cattle embryos. *Biology of Reproduction*. 49: 582-587.
- Mermillod, P., B. Oussaid and Y. Cognié. 1999. Aspects of follicular and oocyte maturation that affect the developmental potential of embryos. *Journal of Reproduction and Fertility*. 54: 449-460.
- Merton, J.S., A.P.W. de Roos, E. Mullaart, L. de Ruigh, L. Kaal, P.L.A.M. Vos and S.J. Dieleman. 2003. Factors affecting oocyte quality and quantity in commercial application of embryo technologies in the cattle breeding industry. *Theriogenology*. 59: 651-674.

Metcalf, A.D., H.R. Hunter, D.J. Bloor, B.A. Lieberman, H.M. Picton, H.J. Leese, S.J. Kimber and D.R. Brison. 2004. Expression of 11 members of the BCL-2 family of apoptosis regulatory molecules during human preimplantation embryo development and fragmentation. *Molecular Reproduction and Development*. 68: 35-50.

Mgongo, F.O.K. 1987. Doses of prostaglandin analogue 'cloprostenol' by intravulvo-submucosal IVSM. Injections effective for the induction of oestrus in goats. *Animal Reproduction Science*. 14: 139-146.

Mgongo, F.O.K. 1988. The effects of buck teasing on synchronization of estrus in goats after intravulvo-submucosal administration of cloprostenol. *Theriogenology*. 30: 987-995.

Miller, D.J. and R.L. Ax. 1989. Chemical N-desulfation of heparin negates its ability to capacitate bovine spermatozoa. *Gamete Research*. 23: 451-465.

Miller, G.F., D.W. Gliedt, T.D. Lester, J.N. Pierson, J.M. Rakes and R.W. Rorie. 1992. Addition of bovine oviductal epithelial cells (BOEC) and/or penicillamine, hypotaurine and epinephrine (PHE) to bovine *in vitro* fertilization (IVF) medium increases the subsequent embryo cleavage rate. *Theriogenology*. 37: 259 (abstract).

Miller, G.F., D.W. Gliedt, J.M. Rakes and R.W. Rorie. 1994. Addition of penicillamine, hypotaurine and epinephrine or bovine oviductal epithelial cells alone or in combination to bovine *in vitro* fertilization medium increases the subsequent embryo cleavage rate. *Theriogenology*. 41: 689-696.

Mingoti, G.Z., J.M. Garcia and A.A.M. Rosa-e-Silva. 2002. Steroidogenesis in cumulus cells of bovine cumulus-oocyte complexes matured *in vitro* with BSA and different concentrations of steroids. *Animal Reproduction Science*. 69: 175-186.

Minuth, W.W., G. Stoeckl, S. Kloth and R. Dermietzel. 1992. Construction of an apparatus for perfusion cell cultures which enables *in vitro* experiments under organotypic conditions. *European Journal of Cell Biology*. 57: 132-137.

Miranda, M., M.S. Cordeiro, F.C. Biondi, J.K. Dantas, A.J.S. Sousa and O.M. Ohashi. 2002. Parthenogenetic activation with ethanol of buffalo oocytes. *Proceedings of the 1st Buffalo Symposium of Americas, Estacao das Docas, Belem, Para, Brazil*. p. 443.

Mishra, V., A.K. Misra and R. Sharma. 2008. A comparative study of parthenogenic activation and *in vitro* fertilization of bubaline oocytes. *Animal Reproduction Science*. 103: 249-259.

Mitalipov, S.M., K.L. White, V.R. Farrar, J. Morrey and W.A. Reed. 1999. Development of nuclear transfer and parthenogenetic rabbit embryos activated with inositol 1, 4, 5-triphosphate. *Biology of Reproduction*. 60: 821-827.

Mitalipov, S.M., K.D. Nusser and D.P. Wolf. 2001. Parthenogenetic activation of Rhesus monkey oocytes and reconstructed embryos. *Biology of Reproduction*. 65: 253-259.

Mizushima, S. and Y. Fukui. 2001. Fertilizability and developmental capacity of bovine oocytes cultured individually in a chemically defined maturation medium. *Theriogenology*. 55: 1431- 1445.

- Mochizuki, H., Y. Fukui and H. Ono. 1991. Effect of the number of granulose cells added to culture medium for *in vitro* maturation, fertilization and development of bovine oocytes. *Theriogenology*. 39: 973-985.
- Mogas, T., M.J. Palomo, M.D. Izquierdo and M.T. Paramio. 1997a. Developmental capacity of *in vitro* matured and fertilized oocytes from prepubertal and adult goats. *Theriogenology*. 47: 1189-1203.
- Mogas, T., M.J. Palomo, M.D. Izquierdo, M.T. Paramio. 1997b. Morphological events during *in vitro* fertilization of prepubertal goat oocytes matured *in vitro*. *Theriogenology*. 48: 815-829.
- Mohr, L.R. and A.O. Trounson. 1981. Structural changes associated with freezing of bovine embryos. *Biology of Reproduction*. 25: 1009-1025.
- Molowuku, E.C., P.O. Ogunbiyi and T. Sooriyamoorthy. 1980. Estrus synchronization and controlled breeding in goats using PGF₂. *Theriogenology*. 3: 357-361.
- Monaghan, P., C. Carolan, P. Lonergan, H. Sharif, H. Wahid, I. Gordon. 1993. The effect of maturation time on the subsequent *in vitro* development of bovine oocytes. *Theriogenology*. 39: 270.
- Moor, R.M. 1978. Role of steroids in the maturation of ovine oocytes. *Annals Biology Animal Biochemistry and Biophysics*. 18: 477-482.
- Moor, R.M. and A.O. Trounson. 1977. Hormonal and follicular factors affecting maturation of sheep oocytes *in vitro* and their subsequent development capacity. *Journal of Reproduction and Fertility*. 49: 101-109.
- Moor, R.M. and I.M. Crosby. 1985. Temperature-induced abnormalities in sheep oocytes during maturation. *Journal of Reproduction and Fertility*. 75: 467-473.
- Moore, K. and K.R. Bondioli. 1993. Glycine and alanine supplementation of culture medium enhances development of *in vitro* matured and fertilized cattle embryos. *Biology of Reproduction*. 48: 833-840.
- Moreira da Silva, F. and R. Metelo. 2005. Relation between physical properties of the zona pellucida and viability of bovine embryos after slow-freezing and vitrification. *Reproduction in Domestic Animals*. 40: 205-209.
- Mori, T., T. Amano and H. Shimizu. 2000. Roles of gap junctional communication of cumulus cells in cytoplasmic maturation of porcine oocytes cultured *in vitro*. *Biology of Reproduction*. 62: 913-919.
- Motlik, J., A. Pavlok, M. Kubelka, J. Kalous and P. Kalab. 1998. Interplay between cdc2 kinase, and MAP kinase pathway during maturation of mammalian oocytes. *Theriogenology*. 49: 461-469.
- Mucci, N., J. Aller, G.G. Kaiser, F. Hozbor, J. Cabodevila and R.H. Alberio. 2006. Effect of estrous cow serum during bovine embryo culture on blastocyst development and cryotolerance after slow freezing or vitrification. *Theriogenology*. 65: 1551-1562.

- Nagai, T. 1987. Parthenogenetic activation of cattle follicular oocytes *in vitro* with ethanol. *Gamete Research*. 16: 243-249.
- Nagai, T., K. Niwa, A. Iritani and W. Leidl. 1983. Improved rates of sperm penetration *in vitro* of pig follicular oocytes matured in culture. *Japanese Journal of Fertility and Sterility*. 28: 313-318.
- Nagar, D. and G.N. Purohit. 2005. Effect of epidermal growth factor on maturation and fertilization *in vitro* of goat follicular oocytes in a serum free or serum supplemented medium. *Veerinarski Arhiv*. 75: 459-467.
- Nakao, H. and N. Nakatsuji. 1992. Effect of storage conditions of bovine ovaries and oocytes on the success rate of *in vitro* fertilization and culture. *Journal of Reproduction and Development*. 38: 11-13.
- Nandi, S., M.S. Chauhan and P. Palta. 1998. Influence of cumulus cells and sperm concentration on cleavage rate and subsequent embryonic development of buffalo (*Bubalus bubalis*) oocytes matured and fertilized *in vitro*. *Theriogenology*. 50: 1251-1262.
- Naqvi, S.M.K., M.L. Madam, R.S. Manik, M.S. Chauhan and S.K. Singla. 1992. *In vitro* development of ovine oocyte matured and fertilized *in vitro* to compact morula in co-culture system of oviductal cells and conditioned medium. *Proceeding of 12th International Congress Animal Reproduction AI*. 3: 386-388.
- Nedambale, T.L., W. Groen and X. Yang. 2002. Comparison between KSOM and SOFaaci for *in vitro* produced bovine embryos. *Theriogenology*. 57: 523 (abstract).
- Nedambale, T.L., A. Dinnyés, W. Groen, J.R. Dobrinsky, X.C. Tian and X. Yang. 2004. Comparison on *in vitro* fertilized bovine embryos cultured in KSOM or SOF and cryopreserved by slow freezing or vitrification. *Theriogenology*. 62: 437-449.
- Nedambale, T.L., F. Du, J. Xu, S.A. Chaubal, A. Dinnyes, W. Groen, D. Faber, J.R. Dobrinsky, X. Yang and X.C. Tian. 2006. Prolonging bovine sperm-oocyte incubation in modified medium 199 improves embryo development rate and the viability of vitrified blastocyst. *Theriogenology*. 66: 1951-1960.
- Ng, F.L.H., D.Y. Liu and H.W.G. Baker. 1992. Comparison Of Percoll, mini-Percoll and swim-up methods for spermatozoa preparation from abnormal semen samples. *Human Reproduction*. 7: 261-266.
- Niwa, K., C.K. Park and K. Okuda. 1991. Penetration *in vitro* of bovine oocytes during maturation by frozen-thawed spermatozoa. *Journal of Reproduction and Fertility*. 91: 329-336.
- Nowshari, M.A. and G. Brem. 2000. The protective action of polyvinyl alcohol during rapid-freezing of mouse embryos. *Theriogenology*. 53: 1157-1166.
- Nuti, L.C., B.S. Minhas, W.C. Baker, J.S. Capehart and P.Marrack. 1987. Superovulation and recovery of zygotes from Nubian and Alpine dairy goats. *Theriogenology*. 28: 481-488.

- Ocampo, M.B., L.C. Ocampo, T. Mori, J. Ueda and H. Kanagawa. 1994a. Timing of sequential changes in chromosome configurations during the second meiotic division and cytoplasmic events of pig oocytes matured and fertilized *in vitro*. *Animal Reproduction Science*. 34: 281-288.
- Ocampo, M.B., L.C. Ocampo, T. Mori, J. Ueda and H. Kanagawa. 1994b. Nuclear and cytoplasmic maturation of pig oocytes cultured in the amniotic fluid of developing chick embryos. *Journal of Veterinary Medical Science*. 56: 173-176.
- Oofosu, F.A., M.R. Buchanan, N. Anvari, L.M. Smith and M.A. Blajchman. 1989. Plasma anticoagulant mechanisms of heparin, heparin sulfate and dermatan sulfate. *New York Academy of Sciences*. 556: 123-131.
- Okada, K, T. Miyano and M. Miyake. 2003. Activation of pig oocytes by intracytoplasmic injection of strontium and barium. *Zygote*. 11: 159-165.
- Ongeri, E.M., C.L. Bormann, R.E., Butler, D. Melican, W.G. Gavin, Y. Echelard, R.L. Krisher and E. Behboodi. 2001. Development of goat embryos after *in vitro* fertilization and parthenogenetic activation by different methods. *Theriogenology*. 55: 1933-1945.
- Opiela, J., L. Katska-Ksiazkiewicz, D. Lipinski, R. Slomski, M. Bzowska and B. Rynska. 2008. Interactions among activity of glucose-6-phosphate dehydrogenase in immature oocytes, expression of apoptosis related genes Bcl-2 and Bax and developmental competence following IVP in cattle. *Theriogenology*. 69: 546-555.
- Oyamada, T., H. Iwayama and Y. Fukui. 2004. Additional effect of epidermal growth factor during *in vitro* maturation for individual bovine oocytes using a chemically defined medium. *Zygote*. 12: 143-150.
- Ozil, J.P. and D. Huneau. 2001. Activation of rabbit oocytes: the impact of the Ca²⁺ signal regime on development. *Development*. 128: 917-928.
- Ozil, J.P., S. Markoulaki, S. Toth, S. Matson, B. Banrezes, J.G. Knott, R.M. Schultz, D. Huneau and T. Ducibella. 2005. Egg activation events are regulated by the duration of a sustained [Ca²⁺]_{cyt} signal in the mouse. *Developmental Biology*. 282: 39-54.
- Palomo, M.J., D. Izquierdo, T. Mogas and M.T. Paramio. 1999. Effect of semen preparation on IVF of prepubertal goat oocytes. *Theriogenology*. 51: 927-940.
- Park, Y.S., S.S. Kim, J.M. Kim, H.D. Park, M.D. Byun. 2005. The effects of duration of *in vitro* maturation of bovine oocytes on subsequent development, quality and transfer of embryos. *Theriogenology*. 64: 123-134.
- Parks, J.E. and N.A Ruffing. 1992. Factors affecting low temperature survival of mammalian oocytes. *Theriogenology*. 37: 59-73.
- Parnpai, R. and K. Tasripoo. 2003. Effect of different activation protocols on the development of cloned swamp buffalo embryos derived from granulosa cells. *Theriogenology*. 59: 279.
- Parrish, J.J., J.L. Susko-Parrish, M.L. Leibfried-Rutledge, E.S. Critser, W.H. Eyestone, N.L. First. 1986. Bovine *in vitro* fertilization with frozen-thawed semen. *Theriogenology*. 25: 591-600.

- Parrish, J.J., J.L. Susko-Parrish, M.A. Winer and N.L. First. 1988. Capacitation of bovine sperm by heparin. *Biology of Reproduction*. 38: 1171-1180.
- Parrish, J.J., A. Krogenaes and J.L. Susko-Parrish. 1995. Effect of bovine sperm separation by either swim-up or Percoll method on success of *in vitro* fertilization and early embryonic development. *Theriogenology*. 44: 859-869.
- Pawshe, C.H., S.M. Totey and S.K. Jain. 1994. A comparison of three methods of recovery of goat oocytes for *in vitro* maturation and fertilization. *Theriogenology*. 42: 117-125.
- Pawshe, C.H., A. Palanisamy, M. Taneja, S.K. Jain and S.M. Totey. 1996. Comparison of various maturation treatments on *in vitro* maturation of goat oocytes and their early embryonic development and cell numbers. *Theriogenology*. 46: 971-982.
- Pavasuthipaisi, K., S. Lhuangmahamongkol, C. Tocharus, Y. Kitiyanant and P. Prempre. 1994. Porcine oviductal cells support *in vitro* bovine embryo development. *Theriogenology*. 41: 127-1138.
- Pegg, D.E., M.C. Wusteman and S. Boylan. 1997. Fractures in cryopreserved elastic arteries. *Cryobiology*. 34 (2): 183-192.
- Pendleton, R.J., C.R. Youngs, R.W. Rorie, S.H. Pool, M.A. Memon and R.A. Godke. 1992. Follicle stimulating hormone versus pregnant mare serum gonadotropin for superovulation of dairy goats. *Small Ruminant Research*. 8: 217-224.
- Perera, B.M.A.O., T.A. Bongso and P. Abeynaike. 1978. Oestrus synchronization in goats using cloprostenol. *Veterinary Rec*. 102: 314 (abstract).
- Phua, C.Y. 2006. Development of a PCR-based method for sex determination of caprine embryos produced from *in vitro* maturation, fertilisation and culture techniques. MSc Thesis. University of Malaya. Kuala Lumpur, Malaysia.
- Picco, S.J., J.M. Anchordoquy, D.G. de Matos, J.P. Anchordoquy, A. Seoane, G.A. Mattioli, A.L. Errecalde and C.C. Furnus. 2010. Effect of increasing zinc sulphate concentration during *in vitro* maturation of bovine oocytes. *Theriogenology*. 74: 1141-1148.
- Pickering, S.J., P.R. Braude, M.H. Johnson, A. Cant and J. Currie. 1990. Transient cooling to room temperature can cause irreversible disruption of the meiotic spindle in the human oocyte. *Fertility and Sterility*. 54: 102-108.
- Piekos, M.W., J. Frasier, S. Mack, Z. Binor, B. Soltes, M.W. Molo, E. Radwanska and R.G. Rawlins. 1995. Evaluation of co-culture and alternative culture systems for promoting *in-vitro* development of mouse embryos. *Human Reproduction*. 10: 1486-1491.
- Pimentel, A.M., V. Bordignon and L.C. Smith. 2002. Effect of meiotic resumption delay on *in vitro* maturation and parthenogenetic development of equine oocytes. *Theriogenology*. 57: 735 (abstract).

Pinyopummintr, T. and B.D. Bavister. 1991. *In vitro* matured/fertilized bovine oocytes can develop into morulae/blastocysts in chemically defined, protein-free culture media. *Biology of Reproduction*. 45: 736-742.

Pinyopummintr, T. and B.D. Bavister. 1995. Optimum gas atmosphere for *in vitro* maturation and *in vitro* fertilization of bovine oocytes. *Theriogenology*. 44: 471-477.

Pinyopummintr, T. and B.D. Bavister. 1996. Effects of amino acids on development *in vitro* of cleavage stage bovine embryos into blastocysts. *Reproduction, Fertility and Development*. 8: 835-841.

Plante, L. and W.A. King. 1994. Light and electron microscopic analysis of bovine embryos derived by *in vitro* and *in vivo* fertilization. *Journal of Assisted Reproduction and Genetics*. 11: 515-529.

Prentice, J.R., J. Singh, O. Dochi and M. Anzar. 2011. Factors affecting nuclear maturation, cleavage and embryo development of vitrified bovine cumulus-oocyte complexes. *Theriogenology*. 75: 602-609.

Presicce, G.A. and X. Tang. 1994. Nuclear dynamics of parthenogenetic development of bovine oocytes matured *in vitro* for 20 and 40 h and activated by combined ethanol and cycloheximide treatment. *Molecular Reproduction*. 37: 61-68.

Presicce, G.A. and X. Yang. 1994. Nuclear dynamics of parthenogenesis of bovine oocytes matured *in vitro* for 20 and 40 h and activated with combined ethanol and cycloheximide. *Molecular Reproduction and Development*. 37: 61-68.

Prichard, J.F., S.H. Pool, E.G. Blakewood and R.A. Godke. 1990. Culture of early stage caprine embryos using goat oviductal and uterine cell monolayer. *Theriogenology*. 33: 300.

Prichard, J.F., S.H. Pool, E.G. Blakewood, Y. Menezes and R.A. Godke. 1991. Culture of early stage caprine embryos using goat oviductal cell monolayers. *Theriogenology*. 35: 259.

Procházka, R., E. Nagyová, G. Brem, K. Schellander and J. Motlík. 1998. Secretion of cumulus expansion-enabling factor (CEEF) in porcine follicles. *Molecular Reproduction and Development*. 49: 141-149.

Pugh, P.A., H.R. Tervit and H. Niemann. 2000. Effects of vitrification medium composition on the survival of bovine *in vitro* produced embryos, following in straw-dilution, *in vitro* and *in vivo* following transfer. *Animal Reproduction Science*. 58: 9-22.

Pujol, M., M. Lopez-Bejar and M.T. Paramio. 2004. Developmental competence of heifer oocytes selected using the brilliant cresyl blue (BCB) test. *Theriogenology*. 61: 735-744.

Puls-Kleingeld, M., M.A. Nowshari and W. Holtz. 1992. Cryopreservation of goat embryos by the one-step or three-step equilibration procedure. *In: Recent Advances in Goat Production*. Editor: R.R. Lokeshwar. Nutan Printers. pp. 1388-1391.

- Rahman, A.N.M.A. 2008. Goat embryo production from *in vitro* matured heterogenous oocytes fertilised by intracytoplasmic sperm injection (ICSI) technique. PhD Thesis. University of Malaya. Kuala Lumpur, Malaysia.
- Rall, W.F. 1987. Factors affecting the survival of mouse embryos cryopreserved by vitrification. *Cryobiology*. 24: 387-402.
- Rall, W.F. and G.M. Fahy. 1985. Ice-free cryopreservation of mouse embryos at -196°C by vitrification. *Nature*. 313: 573-575.
- Ralph, J., E. Telfer and I. Wilmut. 1995. Bovine cumulus cell expansion does not depend on the presence of an oocyte secreted factor. *Molecular Reproduction and Development*. 42: 248-253.
- Ramli, R. 1995. An attempt to cryopreserve mouse embryos using quick freezing, direct plunging and vitrification techniques. MSc Thesis. University of Malaya. Kuala Lumpur, Malaysia.
- Ramli, R. 1996. The freezability of micromanipulated mouse oocytes and embryos using quick freezing technique. PhD Thesis. University of Malaya. Kuala Lumpur, Malaysia.
- Rangasamy, S., K. Kulasekar, S. Balasubramanian, G.D. Raj and C. Verrapandian. 2009. Influence of antioxidant supplementation on *in vitro* production of bovine embryos. *Indian Veterinary Journal*. 86: 148-150.
- Regueiro, M., R. Pérez Clariget, A. Ganzábal, M. Aba and M. Forsberg. 1999. Effect of medroxyprogesterone acetate and eCG treatment on the reproductive performance of dairy goats. *Small Ruminant Research*. 33: 223-230.
- Rehman, N., A.R. Collins, T.K. Suh, R.W. Wright. 1994. Effect of sperm exposure time on *in vitro* fertilization and embryo development of bovine oocytes matured *in vitro*. *Theriogenology*. 41: 1447-1452.
- Reischl, J., K. Prella, H. Schol, C. Neumuller, R. Einspanier, F. Sinowatz and E. Wolf. 1999. Factors affecting proliferation and dedifferentiation of primary bovine oviduct epithelial cells *in vitro*. *Cell Tissue Research*. 296: 371-383.
- Rexroad, C.E.Jr. 1989. Co-culture of domestic animal embryos. *Theriogenology*. 31: 105-114.
- Rexroad, C.E. Jr. and A.M. Powell. 1988. Co-culture of ovine eggs with oviductal cells and trophoblast vesicles. *Theriogenology*. 29: 387-397.
- Rho, G.J., A.C. Hahnel and K.J. Betteridge. 2001. Comparisons of oocyte maturation times and of three methods of sperm preparation for their effects on the production of goat embryos *in vitro*. *Theriogenology*. 56: 503-516.
- Rief, S., F. Sinowatz, M. Stojkovic, R. Einspanier, E. Wolf and K. Prella. 2002. Effects of a novel co-culture system on development, metabolism and gene expression of bovine embryos produced *in vitro*. *Reproduction*. 124: 543-556.

Rieger, D., N.M. Loskutoff and K.J. Betteridge. 1992. Developmentally related changes in the metabolism of glucose and glutamine by cattle embryos produced and co-cultured *in vitro*. *Journal of Reproduction and Fertility*. 95: 585-595.

Rieger, D., B. Grisart, E. Semple, A. Van Langendonck, K.J. Betteridge and F. Dessy. 1995. Comparison of the effects of oviductal cell co-culture and oviductal cell-conditioned medium on the development and metabolic activity of cattle embryos. *Journal of Reproduction and Fertility*. pp. 10591-10598.

Rios, G.L., N.C. Mucci, G.G. Kaiser and R.H. Alberio. 2010. Effect of container, vitrification volume and warming solution on cryosurvival of *in vitro*-produced bovine embryos. *Animal Reproduction Science*. 118: 19-24.

Ritar, A.J., W.M.C. Maxwell and S. Salamon. 1984. Ovulation and LH secretion in the goat after intravaginal progestagensponge-PMSG treatment. *Journal of Reproduction and Fertility*. 72: 559-563.

Ritar, A., J. Robertson, G. Evans. 1994. Ovulatory activity, hormonal induction of ovulation and fertility of young cashmere and Angora female goats in a temperate environment. *Reproduction, Fertility and Development*. 6: 737-747.

Rizos, D., F. Ward, M.P. Boland and P. Lonergan. 2001. Effect of culture system on the yield and quality of bovine blastocysts as assessed by survival after vitrification. *Theriogenology*. 56: 1-16.

Rizos, D., F. Ward, P. Duffy, M.P. Boland and P. Lonergan. 2002. Consequences of bovine oocyte maturation, fertilization or early embryo development *in vitro* versus *in vivo*: implications for blastocyst yield and blastocyst quality. *Molecular Reproduction and Development*. 61: 234-248.

Rizos, D., A.A. Gutiérrez, S.P. Garnelo, J. Fuente, P. Lonergan and M.P. Boland. 2003. Bovine embryo culture in the presence or absence of serum: Implications for blastocyst development, cryotolerance and messenger RNA expression. *Biology of Reproduction*. 68: 236-243.

Robin, N., J.P. Laforest, J.G. Lussier and L. Guilbault. 1994. Induction of estrus with intramuscular injections of GnRH or PMSG in lactating goats (*Capra hircus*) primed with a progestagen during anestrus. *Theriogenology*. 42: 107-116.

Rodriguez-Boulan, E. and W.J. Nelson. 1989. Morphogenesis of the polarized epithelial cell phenotype. *Science*. 245: 718-725.

Rodriguez-Almeida, F.A., M. Cuadras, A. Anchondo, S. Romo-Garcia, B.E. Sanchez, J.A. Jimenez and A.D. Alarcon-Rojo. 2005. Heparin level effect on sperm capacitation of fresh and frozen-thawed bovine semen. *Proceedings of Western Section American Society of Animal Science*. pp. 336-338.

Rodriguez-Dorta, N., Y. Cognié, F. González, N. Poulin, F. Guignot, J.L. Touzé, G. Baril, F. Cabrera, D. Álamo, M. Batista, A. Gracia and P. Mermillod. 2007. Effect of coculture with oviduct epithelial cells on viability after transfer of vitrified *in vitro* produced goat embryos. *Theriogenology*. 68: 908-913.

Rodríguez-González, E., M. López-Béjar, E. Velilla and M.T. Paramio. 2002. Selection of prepubertal goat oocytes using the brilliant cresyl blue test. *Theriogenology*. 57: 1397-1409.

Rodríguez-González, E., M. López-Béjar, D. Izquierdo and M.T. Paramio. 2003. Developmental competence of prepubertal goat oocytes selected with brilliant cresyl blue and matured with cysteamine supplementation. *Reproduction, Nutrition, Development*. 43: 179-187.

Romaguera, R., A. Casanovas, R. Morató, D. Izquierdo, M. Catalá, A.R. Jimenez-Macedo, T. Mogas and M.T. Paramio. 2010a. Effect of follicle diameter on oocyte apoptosis, embryo development and chromosomal ploidy in prepubertal goats. *Theriogenology*. 74: 364-373.

Romaguera, R., R. Morató, A.R. Jiménez-Macedo, M. Catalá, M. Roura, M.T. Paramio, M.J. Palomo, T. Mogas and D. Izquierdo. 2010b. Oocyte secreted factors improve embryo developmental competence of COCs from small follicles in prepubertal goats. *Theriogenology*. 74: 1050-1059.

Romano, J.E. 1998. Effect of two doses of cloprostenol in two schemes for estrous synchronization in Nubian goats. *Small Ruminant Research*. 28: 171-176.

Rorie, R.W., G.F. Miller, K.B. Nasti and R.W. Mcnew. 1994. *In vitro* development of bovine embryos as affected by different lots of bovine serum albumin and citrate. *Theriogenology*. 42: 397-403.

Rose, T.A. and B.D. Bavister. 1992. Effect of oocyte maturation medium on *in vitro* development of *in vitro* fertilization bovine embryos. *Molecular Reproduction and Development*. 31: 72-77.

Rosnina, Y., M.R. Jainudeen and M. Nihayah. 1992. Superovulation and egg recovery in goats in the tropics. *Veterinary Record*. 130: 97-99.

Roushandeh, A.M., P. Pasbakhsh, Z. Alizadeh and M.H. Roudkenar. 2007. *In vitro* maturation media, cysteamine concentration and glutathione level affects blastocyst development in mouse. *Iranian Journal of Reproductive Medicine*. 5: 159-163.

Roy, F., M.C. Maurel, B. Combes, D. Vaiman, E.P. Cribiu, I. Lantier, T. Pobel, F. Deletang, Y. Combarnous and F. Guillou. 1999. The negative effect of repeated equine chorionic gonadotropin treatment on subsequent fertility in Alpine goats is due to a humoral immune response involving the major histocompatibility complex. *Biology of Reproduction*. 60: 805-813.

Rubio, C., C. Simon, A. Mercader, J. Garcia-Velasco, J. Remohi and A. Pellicer. 2000. Clinical experience employing co-culture of human embryos with autologous human endometrial epithelial cells. *Human Reproduction*. 15: 31-38.

Saeki, K., M.L. Leibfried-Rutledge and N.L. First. 1990. Are fetal calf serum and hormones necessary during *in vitro* maturation of cattle oocytes for subsequent development. *Theriogenology*. 33: 316 (abstract).

- Saha, S., R. Rajamahendran, A. Boediono, C. Sumantri and T. Suzuki. 1996. Viability of bovine blastocysts obtained after 7, 8 or 9 days of culture *in vitro* following vitrification and one-step rehydration. *Theriogenology*. 46: 331-343.
- Saikhun, J., N. Kitiyanant, C. Songtaveesin, K. Pavasuthipaisit and Y. Kitiyanant. 2004. Development of swamp buffalo (*Bubalus bubalis*) embryos after parthenogenetic activation and nuclear transfer using serum fed or starved fetal fibroblasts. *Reproduction, Nutrition, Development*. 44: 65-78.
- Sakkas, D., P.A. Batt and A.W.N. Cameron. 1989. Development of preimplantation goat (*Capra hircus*) embryos *in vivo* and *in vitro*. *Journal of Reproduction and Fertility*. 87: 359-365.
- Salustri, A. and G. Siracusa. 1983. Metabolic coupling, cumulus expansion and meiotic resumption in mouse cumuli oophori cultured *in vitro* in the FSH or dCAMP, or stimulated *in vivo* by hCG. *Journal of Reproduction and Fertility*. 68: 335-341.
- Sanbuissho, A. and W.R. Threlfall. 1990. The influence of serum and gonadotropins on *in vitro* maturation and fertilization of bovine oocytes. *Theriogenology*. 34: 341-348.
- Sarbandi, M.S.H. 1994. Cryopreservation of mouse embryos obtained from *in vivo* and *in vitro* through two methods of vitrification. BSc Thesis. University of Malaya. Kuala Lumpur, Malaysia.
- Schneider, U. and P. Mazur. 1984. Osmotic consequences of cryoprotectant permeability and its relation to the survival of frozen-thawed embryos. *Theriogenology*. 21: 68-79.
- Schroeder, A.C. and J.J. Eppig. 1984. The developmental capacity of mouse oocytes that matured spontaneously *in vitro* is normal. *Developmental Biology*. 102: 493-497.
- Selman, H.A. and I. El-Danasouri. 2002. Pregnancies derived from vitrified human zygotes. *Fertility and Sterility*. 77: 422-423.
- Selvaraju, M. and D. Kathiresan. 1997. Effect of oestrus synchronization on kidding rate in Tellicherry goats. *Indian Veterinary Journal*. 74: 35-37.
- Selvaraju, S. S.K. Agarwal, S.D. Karche and A.C. Majumdar. 2003. Ovarian response, embryo production and hormonal profile in superovulated goats treated with insulin. *Theriogenology*. 59: 1459-1468.
- Semple, E., N. Loskutoff, S.P. Leibo and K.J. Betteridge. 1993. Effects of culture medium and maturation time on *in vitro* development of bovine oocytes into blastocysts. *Theriogenology*. 39: 307.
- Shaw, J.M. and A.O. Trounson. 1989. Effect of dimethylsulfoxide and protein concentration on the viability of two-cell mouse embryos frozen with a rapid freezing technique. *Cryobiology*. 26: 413-421.
- Shaw, J.M., L. Kuleshova, D. MacFarlane and A. Trounson. 1997. Vitrification properties of solutions of ethylene glycol in saline containing PVP, Ficoll, or dextran. *Cryobiology*. 35: 219-229.

- Shelton, M. 1969. The influence of the presence of male goat on the initiation of estrous cycling and ovulation of Angora goats. *Journal of Animal Science*. 19: 368-375.
- Sherbahn, R., J. Frasor, E. Radwanska, Z. Binor, M. Wood-Molo, M. Hibner, S. Mack and R.G. Rawlins. 1996. Comparison of mouse embryo development in open and microdrop co-culture systems. *Human Reproduction*. 11: 2223-2229.
- Shiina, Y., M. Kaneda, K. Matsuyama, K. Tanaka, M. Hiroi and K. Doi. 1993. Role of extracellular Ca^{2+} on the intracellular Ca^{2+} changes in fertilized and activated mouse oocytes. *Journal of Reproduction and Fertility*. 97: 143-150.
- Shioya, Y. M. Kumayama, M. Fukushima, S. Iwasaki and A. Hanada. 1988. *In vitro* fertilization and cleavage capability of bovine follicular oocytes classified by cumulus cells and matured *in vitro*. *Theriogenology*. 30: 489-497.
- Siddiquey, A.K.A. and J. Cohen. 1982. *In vitro* fertilization in the mouse and the relevance of different sperm/egg concentrations and volumes. *Journal of Reproduction and Fertility*. 66: 237-242.
- Siiteri, J.E., P. Dandekar and S. Meizel. 1988. Human sperm acrosome reaction-inducing activity associated with the human cumulus oophorus and mural granulosa cells. *Journal of Experimental Zoology*. 246: 71-80.
- Silva, C.C., N.P. Groome and P.G. Knight. 1999. Demonstration of a suppressive effect of inhibin α subunit on the developmental competence of *in vitro* matured bovine oocytes. *Journal of Reproduction and Fertility*. 115: 381-388.
- Simon, C., A. Mercader, J. Garcia-Velasco, G. Nikas, C. Moreno, J. Remohi and A. Pellicer. 1999. Coculture of human embryos with autologous human endometrial epithelial cells in patients with implantation failure. *Journal of Clinical Endocrinology and Metabolism*. 84: 2638-2646.
- Simone, C.M., W. Yamazaki, C.L.V. Leal, J.A. de Oliveira and J.M. Garcia. 2005. Use of strontium for bovine oocyte activation. *Theriogenology*. 63: 2089-2102.
- Sinclair, K.D., T.G. McEvoy, E.K. Maxfield, C.A. Maltin, L.E. Young, I. Wilmut, P.J. Broadbent and J.J. Robinson. 1999. Aberrant fetal growth and development after *in vitro* culture of sheep zygotes. *Journal of Reproduction and Fertility*. 116: 177-186.
- Singla, S.K., Manik, R.S., Madan and M.L., 1997. Parthenogenesis in buffalo (*Bubalus bubalis*). *Indian Journal of Animal Reproduction*. 18: 2 (abstract).
- Sirard, M.A., F. Richard, P. Blondin and C. Robert. 2006. Contribution of the oocyte to embryo quality. *Theriogenology*. 65: 126-136.
- Smith, S., M. Schmidt, B. Purwantara and T. Greve. 1992. Oviduct epithelial cell co-culture of early porcine embryos. *Acta Veterinaria Scandinavica*. 33: 349-355.
- Smorag, Z. and B. Gajda. 1994. Cryopreservation of mammalian ova and embryos by vitrification. *Biotechnology Advances*. 12: 449-465.
- Sohnrey, B. and W. Holtz. 2000. Transcervical embryo collection in Boer goats. *Small Ruminant Research*. 36: 195-200.

- Solano, R., R. De Armas, C.A. Pupo and F.O. Castro. 1994. Short term preservation of intrafollicular oocytes at 4°C. *Theriogenology*. 41: 299.
- Song, Y.C., B.S. Khirabadi, F.G. Lightfoot, K.G.M. Brockbank and M.J. Taylor. 2000. Vitreous cryopreservation maintains the function of vascular grafts. *Nature Biotechnology*. 18: 296-299.
- Spikings, E.C., J. Alderson and J.C. St John. 2007. Regulated mitochondrial DNA replication during oocyte maturation is essential for successful porcine embryonic development. *Biology of Reproduction*. 76: 327-335.
- Squires, E.L., E.M. Carnevale, P.M. McCue and J.E. Bruemmer. 2003. Embryo technologies in the horse. *Theriogenology*. 59: 151-170.
- Steeves, T.E. and D.K. Gardner. 1999. Temporal and differential effects of amino acids on bovine embryo development in culture. *Biology of Reproduction*. 61: 731-740.
- Stice, S.L. and J.M. Robl. 1988. Nuclear reprogramming in nuclear transplant rabbit embryos. *Biology of Reproduction*. 39: 657-664.
- Stock, A.E., T.K. Woodruff and L.C. Smith. 1997. Effects of inhibin A and activin A during *in vitro* maturation of bovine oocytes in hormone- and serum free medium. *Biology of Reproduction*. 56: 1559-1564.
- Stojkovic, M., S.A. Machado, P. Stojkovic, V. Zakhartchenko, P. Hutzler, P.B. Goncalves and E. Wolf. 2001. Mitochondrial distribution and adenosine triphosphate content of bovine oocytes before and after *in vitro* maturation: correlation with morphological criteria and developmental capacity after *in vitro* fertilization and culture. *Biology of Reproduction*. 64: 904-909.
- Stubbings, R.B. and C.P. Wosik. 1991. Glass wool versus swim-up separation of bovine spermatozoa for *in vitro* fertilization. *Theriogenology*. 35: 276 (abstract).
- Sturm, K.S., M.L. Flannery and R.A. Pedersen. 1994. Abnormal development of embryonic and extraembryonic cell lineages in parthenogenetic mouse embryos. *Developmental Dynamic*. 201: 11-28.
- Su, Y.Q., K. Sugiura, K. Wigglesworth, M.J. O'Brien, J.P. Affourtit, S.A. Pangas, M.M. Matzuk and J.J. Eppig. 2008. Oocyte regulation of metabolic cooperativity between mouse cumulus cells and oocytes: BMP15 and GDF9 control cholesterol biosynthesis in cumulus cells. *Development*. 135: 111-121.
- Suarez, S.S. 1996. Hyperactivated motility in sperm. *Journal of Andrology*. 17 (4): 331-335.
- Suarez, S.S. and H.C. Ho. 2003. Hyperactivation of mammalian sperm. *Cellular and Molecular Biology (Noisy-Le-Grand)*. 49 (3): 351-356.
- Suarez, S.S., D.P. Wolf and S. Meizel. 1986. Induction of the acrosome reaction in human spermatozoa by a fraction of human follicular fluid. *Gamete Research*. 14: 107-121.

Suarez, S.S., X.B. Dai, R.P. DeMott, K. Redfern and M.A. Mirando. 1992. Movement characteristics of boar sperm obtained from the oviduct or hyperactivated *in vitro*. *Journal of Andrology*. 13 (1): 75-80.

Sugiura, K.P.F and J.J. Eppig. 2005. Oocyte control of metabolic cooperativity between oocytes and companion granulosa cells: energy metabolism. *Developmental Biology*. 279: 20-30.

Sullivan, R., C. Duchesne, N. Fahmy, M. Morin and P. Dione. 1990. Protein synthesis and acrosome reaction-inducing activity of human cumulus cells. *Human Reproduction*. 5: 830-834.

Sum, A.K., R. Faller and J.J. de Pablo. 2003. Molecular simulation study of phospholipid bilayers and insights of the interactions with disaccharides. *Biophysical Journal*. 85: 3636-3645.

Sumantri, C., A. Boediono, M. Ooe, M. Murakami, S. Saha and T. Suzuki. 1997. The effect of sperm-oocyte incubation time on *in vitro* embryo development using sperm from a tetraparental chimeric bull. *Animal Reproduction Science*. 48: 187-195.

Surani, M.A. 2001. Reprogramming of genome function through epigenetic inheritance. *Nature*. 414: 122-128.

Surani, M.A., S.C. Barton and M.L. Norris. 1984. Development of reconstituted mouse eggs suggests imprinting of the genome during gametogenesis. *Nature*. 308: 548-550.

Susko-Parrish, J.L., M.B. Wheeler, R.L. Ax, N.L. First and J.J. Parrish. 1990. The effect of penicillamine, hypotaurine, epinephrine and sodium metabisulfite on bovine *in vitro* fertilization. *Theriogenology*. 33: 333 (abstract).

Susko-Parrish J.L., M.L. Liebfried-Rutledge, D.L. Northey, V. Schutzkus and N.L. First. 1994. Inhibition of protein kinases after an induced calcium transient causes transition of bovine oocytes to embryonic cycles without meiotic completion. *Developmental Biology*. 166: 729-739.

Suss, U., K. Wuthrich and G. Stranzinger. 1988. Chromosome configuration and time sequence of the first meiotic division in bovine oocytes matured *in vitro*. *Biology of Reproduction*. 38: 871-880.

Suzuki, C. and K. Yoshioka. 2006. Effects of amino acid supplements and replacement of polyvinyl alcohol with bovine serum albumin in porcine zygote medium. *Reproduction, Fertility and Development*. 18 (7): 789-795.

Suzuki, T., A. Boediono, M. Takagi, S. Saha and C. Sumantri. 1996. Fertilization and development of frozen-thawed germinal vesicle bovine oocytes by a one-step dilution method *in vitro*. *Cryobiology*. 33: 515-524.

Suzuki, H., L. Liu and X. Yang. 1999. Age-dependent development and surface ultrastructural changes following electrical activation of bovine oocytes. *Reproduction, Fertility and Development*. 11 (3): 159-165.

- Szell, A. and J.N. Shelton. 1986. Sucrose dilution of glycerol from mouse embryos frozen rapidly in liquid nitrogen vapour. *Journal of Reproduction and Fertility*. 76: 401-408.
- Szell, A. and J.N. Shelton. 1987. Osmotic cryoprotective effects of glycerol-sucrose solution on Day-3 mouse embryos. *Journal of Reproduction and Fertility*. 80: 309-316.
- Szell, A.Z. and D.P. Windsor. 1994. Survival of vitrified sheep embryos *in vitro* and *in vivo*. *Theriogenology*. 42: 881-889.
- Tachikawa, S., T. Otoi, S. Kondo, T. Machida and M. Kasai. 1993. Successful vitrification of bovine blastocysts, derived by *in vitro* maturation and fertilization. *Molecular Reproduction and Development*. 34: 266-271.
- Takagi, Y., K. Mori, M. Tomizawa, T. Takahashi, S. Sugawara and J. Masaki. 1991. Development of bovine oocytes matured, fertilized and cultured in a serum-free, chemically defined medium. *Theriogenology*. 35: 1197-1207.
- Takahashi, M., T. Nagai, S. Hamano, M. Kuwayama, N. Okamura and A. Okano. 1993. Effect of thiol compounds on *in vitro* development and intra cellular glutathione content of bovine embryos. *Biology of Reproduction*. 49: 228-232.
- Takahashi, Y. and H. Kanagawa. 1998. Effects of oxygen concentration in the gas atmosphere during *in vitro* insemination of bovine oocytes on the subsequent embryonic development *in vitro*. *Journal of Veterinary Medical Science*. 60: 365-367.
- Takeda, T., R.P. Elsdon and G.E. Junior Seidel. 1984. Cryopreservation of mouse embryos by direct plunging into liquid nitrogen. *Theriogenology*. 21: 266.
- Talbot, P. and R.S. Chacon. 1981. A triple-stain technique for evaluating normal acrosome reaction of human sperm. *Journal of Experimental Zoology*. 215: 201-208.
- Tanghe, S., A.V. Soom, H. Nauwynck, M. Coryn and A. de Kruif. 2002. Minireview: Functions of the cumulus oophorus during oocyte maturation, ovulation, and fertilization. *Molecular Reproduction and Development*. 61: 414-424.
- Tanghe, S. A.V. Soom, J. Mehrzad, D. Maes, L. Duchateau and A. de Kruif. 2003. Cumulus contributions during bovine fertilization *in vitro*. *Theriogenology*. 60: 135-149.
- Tardif, S., C. Dubé and J.L. Bailey. 2003. Porcine sperm capacitation and tyrosine kinase activity are dependent on bicarbonate and calcium but protein phosphorylation is only associated with calcium. *Biology of Reproduction*. 68: 207-213.
- Taylor, D.J.W. 1978. Oestrus synchronization in goats. *Veterinary Rec.* 102: 390.
- Taylor, M.J. 1984. Sub-zero preservation and the prospect of long-term storage of multicellular tissues and organs. *In: Transplantation Immunology: Clinical and Experimental*. Editor: R.Y. Calne. Oxford University Press. Oxford, New York and Tokyo. pp. 360-390.
- Taylor, M.J. 1987. Physico-chemical principles of low temperature biology. *In: The Effects of Low Temperatures on Biological System*. Editors: B.W.W. Grout and J.G. Morris. Edward Arnold. London. pp. 3-71.

- Teotia, A., G.T. Sharma and A.C. Majumdar. 2001. Fertilization and development of caprine oocytes matured over granulosa cell monolayers. *Small Ruminant Research*. 40: 165-177.
- Tervit, H.R. 1996. Laparoscopy/laparotomy oocyte recovery and juvenile breeding. *Animal Reproduction Science*. 42: 227-238.
- Tervik, H.R. and P.G. Havik. 1976. A modified technique for flushing ova from the sheep uterus. *New Zealand Veterinary Journal*. 24: 138-140.
- Tervit, H.R., D.G. Whittingham and L.E.A. Rowson. 1972. Successful culture of *in vitro* sheep and cattle ova. *Journal of Reproduction and Fertility*. 30: 493-497.
- Tervit, H.R., J.F. Smith, L.T. McGowan and P.A. Pugh. 1995. Birth of lambs from embryos produced *in vitro* following laparoscopic recovery of follicular oocytes. *Proceedings of the Australian Society for Reproductive Biology*. 27: 68 (abstract).
- Tesarik, J. 1985. Comparison of acrosome reaction-inducing activities of human cumulus oophorus, follicular fluid and ionophore A23187 in human sperm populations of proven fertilizing ability *in vitro*. *Journal of Reproduction and Fertility*. 74: 383-388.
- Thibault, C., M. Gerard and Y. Menezo. 1975. Preovulatory and ovulatory mechanisms in oocyte maturation. *Journal of Reproduction and Fertility*. 45: 605-610.
- Thomas, W.K. and Jr. G.E. Seidel. 1993. Effects of cumulus cells on culture of bovine embryos derived from oocytes matured and fertilized *in vitro*. *Journal of Animal Science*. 71: 2506-2510.
- Thompson, J.G. 1997. Comparison between *in vivo*-derived and *in vitro* produced pre-elongation embryos from domestic ruminants. *Reproduction, Fertility and Development*. 9: 341-354.
- Thompson, J.G.E. and J.M. Cummins. 1985. The effects of washing and protein supplementation on the acrosome reaction of ram spermatozoa *in vitro*. *Journal of Animal Reproduction Science*. 9: 75-86.
- Thompson, J.G.E., A.C. Simpson, P.A.A. Pugh, P.E. Donnelly and H.R. Tervit. 1990. Effect of oxygen concentration on *in-vitro* development of preimplantation sheep and cattle embryos. *Journal of Reproduction and Fertility*. 89: 573-578.
- Thompson, J.G., N. Allen, L.T. McGowan, A.C.S. Bell, M.G. Lambert and H.R. Tervit. 1998. Effect of delayed supplementation of fetal calf serum to culture medium on bovine embryo development *in vitro* and following transfer. *Theriogenology*. 49: 1239-1249.
- Tian, W.N., L.D. Braunstein, J. Pang, K.M. Stuhlmeier, Q.C. Xi, X. Tian and R.C. Stanton. 1998. Importance of glucose-6-phosphate dehydrogenase activity for cell growth. *Journal of Biological Chemistry*. 273: 10609-10617.
- Titterton, J.L., J. Robinson, S.R. Killick and D.M. Hay. 1995. Synthetic and biological macromolecules: protection of mouse embryos during cryopreservation. *Human Reproduction*. 10: 649-653.

- Tomashov-Matar, R., D. Tchetchik, A. Eldar, R. Kaplan-Kraicer, Y. Oron and R. Shalgi. 2005. Strontium-induced rat egg activation. *Reproduction*. 130: 467-474.
- Töpfer-Petersen, E., A. Wagner, J. Friedrich, A. Petrunkina, M. Ekhlasi- Hundriesen, D. Waberski and W. Drommer. 2002. Function of the mammalian oviductal sperm reservoir. *Journal of Experimental Zoology*. 292: 210-215.
- Totey, S.M., C.H. Pawshe and G.P. Singh. 1993. *In vitro* maturation and fertilization of buffalo oocytes (*Bubalus bubalis*): effect of media, hormone and sera. *Theriogenology*. 39: 1153-1171.
- Toyoda, Y., Y. Itagaki, Y. Minato and Y. Fukuda. 1984. Fertilization *in vitro* of pig eggs matured *in vivo* and *in vitro*. *Proceeding of the 10th International Congress of Animal Reproduction AI*. 1: 395.
- Tricoire, H., J.L. Touze and P. Mermillod. 1999. Effect of fetal calf serum on the quality of *in vitro* produced cattle embryos. *Theriogenology*. 51: 257 (abstract).
- Trounson, A., D. Pushett, L.J. Maclellan, I. Lewis and D.K. Gardner. 1994. Current status of IVM/IVF and embryo culture in humans and farm animals. *Theriogenology*. 41: 57-66.
- Tsunada, Y. and T. Sugie. 1989. Superovulation in nonseasonable Japanese native goats, with special reference to the developmental progression of embryos. *Theriogenology*. 31: 991-996.
- Tucker, M.J., H.I. Kort, A.A. Toledo, P.C. Morton, G. Wright, P.E. Ingargiola and C.L. Sweitzer. 1995. Effect of coculture on subsequent survival and implantation of cryopreserved human embryos. *Journal of Assisted Reproduction and Genetics*. 12: 689-692.
- Turner, K. and E.A. Lenton. 1996. The influence of Vero cell culture on human embryo development and chorionic gonadotrophin production *in vitro*. *Human Reproduction*. 11: 1966-1974.
- Urdaneta, A., A.R. Jimenez, D. Izquierdo and M.T. Paramio. 2003. Effect of the addition of glutathione and glucose to the culture medium on embryo development of IVM-IVF prepubertal goat oocytes. *Zygote*. 11: 131-138.
- Utsumi, K., H. Kato and A. Iritani. 1991. Full-term development of bovine follicular oocytes matured in culture and fertilized *in vitro*. *Theriogenology*. 35: 695-703.
- Vajta, G. 2000. Vitrification of the oocytes and embryos of domestic animals. *Animal Reproduction Science*. 60-61: 357-364.
- Vajta, G. and M. Kuwayama. 2006. Improving cryopreservation systems. *Theriogenology*. 65: 236-244.
- Vajta, G., P. Holm, T. Greve and H. Callesen. 1995. Direct in-straw rehydration after thawing of vitrified *in vitro* produced bovine blastocysts. *Veterinary Record*. 137: 672.
- Vajta, G., P. Holm, T. Greve and H. Callesen. 1996. Factors affecting survival rates of *in vitro* produced bovine embryos after vitrification and direct in-straw rehydration. *Animal Reproduction Science*. 45: 191-200.

- Vajta, G., P.J. Booth, P. Holm, T. Greve and H. Callesen. 1997. Successful vitrification of early stage bovine *in vitro* produced embryos with the Open Pulled Straw (OPS) method. *Cryo-Letters*. 18: 191-195.
- Vajta, G., P. Holm, M. Kumayama, P.J. Booth, H. Jacobsen, T. Greve and H. Callesen. 1998. Open pulled straw (OPS) vitrification: A new way to reduce cryoinjuries of bovine ova and embryos. *Molecular Reproduction and Development*. 51: 53-58.
- Valdez, C.A., O.A. Mazni, Y. Takahashi, S. Fujikawa and H. Kanagawa. 1992. Successful cryopreservation of mouse blastocysts using a new vitrification solution. *Journal of Reproduction and Fertility*. 96: 793-802.
- Van Blerkom, J. 2004. Mitochondria in human oogenesis and preimplantation embryogenesis: engines of metabolism, ionic regulation and developmental competence. *Reproduction*. 128: 269-280.
- van der Westerlaken, L.A.J., A. van der Schans, W.H. Eyestone and H.A de Boer. 1994. Kinetics of first polar body extrusion and the effect of time of stripping of the cumulus and time of insemination on developmental competence of bovine oocytes. *Theriogenology*. 42: 361-370.
- Van Langendonkt, A., P. Auquier, I. Donnay, A. Massip and F. Dessy. 1996. Acceleration of *in vitro* bovine embryos development in the presence of fetal calf serum. *Theriogenology*. 45: 194 (abstract).
- Van Oss, C.J., R.F. Giese and J. Norris. 1991. Interaction between advancing ice fronts and erythrocytes: mechanism of erythrocyte destruction upon freezing and influence of cryoprotective agents. *Cell Biophysics*. 18: 253-261.
- Van Soom, A., M.T. Ysebaert and A. de Kruif. 1997. Relationship between timing of development, morula morphology, and cell allocation to inner cell mass and trophectoderm in *in vitro*-produced bovine embryos. *Molecular Reproduction and Development*. 47: 47-56.
- Van Wagtenonk-de Leeuw, A.M., J.H.G. den Dass and W.F. Rall. 1997. Field trial to compare pregnancy rates of bovine embryo cryopreservation methods: vitrification and one-step dilution versus slow freezing and three-step dilution. *Theriogenology*. 48: 1071-1084.
- Vanderhyden, B.C., J.N. Cohen and P. Morley. 1993. Mouse oocytes regulate granulosa cell steroidogenesis. *Endocrinology*. 133: 423-426.
- Vanroose, G., A. Van Soom and A. de Kruif. 2001. From co-culture to defined medium: state of the art and practical considerations. *Reproduction in Domestic Animals*. 36: 25-28.
- Velilla, E., D. Izquierdo, E. Rodriguez-Gonzalez, M. Lopez-Bejar, F. Vidal, M.T. Paramio. 2004. Distribution of prepubertal and adult goat oocyte cortical granules during meiotic maturation and fertilisation: ultrastructural and cytochemical study. *Molecular Reproduction and Development*. 68: 507-514.

- Velilla, E., E. Rodriguez-Gonzalez, F. Vidal, D. Izquierdo and M.T. Paramio. 2006. Mitochondrial organization in prepubertal goat oocytes during *in vitro* maturation and fertilization. *Molecular Reproduction and Development*. 73: 617-626.
- Veliz, F.G., S. Moreno, G. Duarte, J. Vielma, P. Chemineau, P. Poindron, B. Malpoux and J.A. Delgadillo. 2002. Male effect in seasonally anovulatory lactating goats depends on the presence of sexually active bucks, but not estrus females. *Animal Reproduction Science*. 72: 197-207.
- Vergos, E. 1990. *In vitro* fertilization and embryo culture in cattle. PhD Thesis. National University of Ireland. Dublin.
- Verlhac, M.H., J.Z. Kubiak, H.J. Clarke and B. Maro. 1994. Microtubule and chromatin behaviour follow MAPk activity but not MPF activity during meiosis in mouse oocytes. *Development*. 120: 1017-1025.
- Vicente, J.S. and F. Garcia-Ximenez. 1994. Osmotic and cryoprotective effects of a mixture of DMSO and ethylene glycol on rabbit morulae. *Theriogenology*. 42: 1205-1215.
- Vilariño, M., E. Rubianes and A. Menchaca. 2011. Re-use of intravaginal progesterone devices associated with the Short-term Protocol for timed artificial insemination in goats. *Theriogenology*. 75: 1195-1200.
- Villamediana, P., F. Vidal, A. Martino and M.T. Paramio. 1998. Cytogenetic analysis of early embryos obtained by *in vitro* fertilization of oocytes from prepubertal goats. *Proceeding of 14th Symposium AETE*. pp. 264 (abstract).
- Villamediana, P., F. Vidal, M.T. Paramio. 2001. Cytogenetic analysis of caprine 2- to 4-cell embryos produced *in vitro*. *Zygote*. 9: 193-199.
- Vincent, C. and M.H. Johnson. 1992. Cooling, cryoprotectants and the cytoskeleton of the mammalian oocyte. *Oxford Reviews of Reproductive Biology*. 14: 71-100.
- Vitullo, A.D. and J.P. Ozil. 1992. Repetitive calcium stimuli drive meiotic resumption and pronuclear development during mouse oocyte activation. *Developmental Biology*. 151: 128-136.
- Vos, J.P., M. Lopes-Cardozo and B.M. Gadella. 1994. Metabolic and functional aspects of ulfagalactolipids. *Biochemistry Biophysics Acta (Rev Biomembr)*. 1211: 125-149.
- Wang, W.H., L.R. Abeydeera, Y. Han, R.S. Prather and B.N. Day. 1999. Morphologic evaluation and actin filament distribution in porcine embryos produced *in vitro* and *in vivo*. *Biological Reproduction*. 60: 1020-1028.
- Wang, B., H. Baldassarre, T. Tao, M. Gauthier, N. Neveu, J.F. Zhou, M. Leduc, F. Duguay, A.S. Bilodeau, A. Lazaris, C. Keefer and C.N. Karatzas. 2002. Transgenic goats produced by DNA pronuclear microinjection of *in vitro* derived zygotes. *Molecular Reproduction and Development*. 63: 437-443.

- Wang, Z.G., W. Wang, S.D. Yu, Z.R. Xu. 2008. Effects of different activation protocols on preimplantation development, apoptosis and ploidy of bovine parthenogenetic embryos. *Animal Reproduction Science*. 105: 292-301.
- Wang, H., J.X. Zhang, M.B. Zhao, X.L. Zhang, Q.Y. Sun and D.Y. Chen. 2011. Production and health assessment of second-generation cloned Holstein cows derived by somatic cell nuclear transfer. *Animal Reproduction Science*. 126 (1-2): 11-18.
- Wani, G.M., H. Geldermann and J. Hahn. 1990. Superovulations during early luteal phase in goats. *World Review of Animal Production*. 25: 41-43.
- Ward, F., B. Enright, D. Rizos, M. Boland and P. Lonergan. 2002. Optimization of *in vitro* bovine embryo production: effect of duration of maturation, length of gamete co-incubation, sperm concentration and sire. *Theriogenology*. 57: 2105-2117.
- Ware, C.B., M. Maiki-Laurila and N.L. First. 1989. Age dependence of bovine oocyte activation. *Gamete Research*. 22: 265-275.
- Watson, A.J. and Kidder and G.M. 1988. Immunofluorescence assessment of the timing of appearance and cellular distribution of Na/K ATPase during mouse embryogenesis. *Developmental Biology*. 126: 80-90.
- Watson, A.J., A. Hogan, K. Wiemer, G.A. Schultz. 1992. Expression of growth factor ligand and receptor genes in the pre-implantation embryos. *Molecular Reproduction and Development*. 31: 87-95.
- Way, A.L. and G.J. Killian. 2006. Sperm binding, *in vitro* fertilisation, and *in vitro* embryonic development of bovine oocytes fertilized with spermatozoa incubated with norepinephrine. *Animal Reproduction Science*. 96: 1-9.
- Wells, D.N., P.M. Misica and H.R. Tervit. 1999. Production of cloned calves following nuclear transfer with cultured adult mural granulosa cells. *Biology of Reproduction*. 60: 996-1005.
- Westberg, S.A., R.L. Monson and J.J. Rutledge. 2002. Higher hatching rates obtained with BSA supplementation compared with FCS in KSOM medium. *Theriogenology*. 57: 530 (abstract).
- Whitacker, M.J. and R. Patel. 1990. Calcium and cell cycle control. *Development*. 108: 525-542.
- Whittingham, D.G., S.P. Leibo and P. Mazur. 1972. Survival of mouse embryos frozen to -196 and -269°C. *Science*. 178: 411-414.
- Wiemer, K.E., J. Cohen, G.F. Amborski, G. Wright, S. Wiker, L. Munyakazi and R.A. Godke. 1989a. *In-vitro* development and implantation of human embryos following culture on fetal bovine uterine fibroblast cells. *Human Reproduction*. 4: 595-600.
- Wiemer, K.E., J. Cohen, S.R. Wiker, H.E. Malter, G. Wright and R.A. Godke. 1989b. Coculture of human zygotes on fetal bovine uterine fibroblasts: embryonic morphology and implantation. *Fertility and Sterility*. 52: 503-508.

- Wiemer, K.E., A.J. Watson, V. Polanski, A.I. Mckenn, G.H. Fick and G.A. Schultz. 1991. Effect of maturation and co-culture treatments on the developmental capacity of early bovine embryos. *Molecular Reproduction and Development*. 30: 330-338.
- Wilmut, I. and L.E.A. Rowson. 1973. Experiments on the low-temperature preservation of cow embryos. *Veterinary Record*. 92: 686-690.
- Wolkers, W.F., F. Tablin and J.H. Crowe. 2002. From anhydrobiosis to freezing-drying of eukaryotic cells. *Comparative Biochemistry and Physiology-Part A: Molecular Integrity Physiology*. 131 (3): 535-543.
- Wunder, D.M., R. Kretschmer and N.A. Bersinger. 2005. Concentrations of leptin and C-reactive protein in serum and follicular fluid during assisted reproductive cycles. *Human Reproduction*. 20: 1266-1271.
- Xia, P., V.K. Han, D. Viuff, D.T. Armstrong and A.J. Watson. 1996. Expression of insulin-like growth factors in two bovine oviductal cultures employed for embryo co-culture. *Journal of Endocrinology*. 149: 41-53.
- Xiang, D.Z., L. Hong, H.Y. Rong and W.C. Shao. 2008. Development of embryos after *in vitro* fertilization of bovine oocytes with sperm from either yaks (*Bos grunnius*) or cattle (*Bos taurus*). *Animal Reproduction Science*. 108: 208-215.
- Xu, K.P., T. Greve, S. Smith and P. Hyttel. 1986. Chromosomal changes of bovine follicular oocyte maturation *in vitro*. *Acta Veterinaria Scandinavia*. 27: 505-519.
- Xu, K.P., B.R. Yaclav, R.W. Rorie, L. Plante, K.J. Bettridge and W.A. King. 1992. Development and viability of bovine embryos derived from oocytes matured and fertilized *in vitro* and cocultured with bovine oviduct epithelial cells. *Journal of Reproduction and Fertility*. 94: 33-43.
- Xu, J., T.M. Cheung, S.T. Chan, P.C. Ho and W.S. Yeung. 2000. Human oviductal cells reduce the incidence of apoptosis in cocultured mouse embryos. *Fertility and Sterility*. 74: 1215-1219.
- Yacoub, A.N.AI, M. Gauly and W. Holtz. 2010. Open pulled straw vitrification of goat embryos at various stages of development. *Theriogenology*. 73: 1018-1023.
- Yadav, B.R., W.A. King and K.J. Bettridge 1993. Relationship between completion of first cleavage and chromosomal complement, sex and development rates of bovine embryo generated *in vitro*. *Molecular Reproduction and Development*. 36: 434-439.
- Yanagimachi, R. 1988. Mammalian Fertilization. *In: The Physiology of Reproduction*, Volume 1. *Editors: E. Knobil and J.D. Neill*. New York: Raven Press. pp. 135-186.
- Yang, N.S., K.H. Lu and I. Gordon. 1990. *In vitro* fertilization (IVF) and culture (IVC) of bovine oocytes from stored ovaries. *Theriogenology*. 33: 352.
- Yang, B.K., X. Yang and R.H. Foote. 1994a. Early development of IVM/IVF bovine embryos cultured with or without somatic cells in a simple serum-free medium with different concentrations of CO₂ and O₂. *Journal of Reproduction and Development*. 40: 197-205.

- Yang, X., G.A. Presicce, L. Moraghan, S. Jiang and R.H. Foote. 1994b. Synergistic effect of ethanol and cycloheximide on activation of freshly matured bovine oocytes. *Theriogenology*. 41: 395-403.
- Yang, B.C., G.S. Im, D.H. Kim, B.S. Yang, H.J. Oh, H.S. Park, H.H. Seong, S.W. Kim, H.H. Ka and C.K. Lee. 2008. Development of vitrified-thawed bovine oocytes after *in vitro* fertilisation and somatic cell nuclear transfer. *Animal Reproduction Science*. 103: 25-37.
- Yavin, S. and A. Arav. 2007. Measurement of essential physical properties of vitrification solutions. *Theriogenology*. 67: 81-89.
- Yeung, W.S., P.C. Ho, E.Y. Lau and S.T. Chan. 1992. Improved development of human embryos *in vitro* by a human oviductal cell co-culture system. *Human Reproduction*. 7: 1144-1149.
- Yi, Y.J. and C.S. Park. 2005. Parthenogenetic development of porcine oocytes treated by ethanol, cycloheximide, cytochalasin B and 6-dimethylaminopurine. *Animal Reproduction Science*. 86: 297-304.
- Yin, X.J., T. Tani, Y. Kato and Y. Tsunoda. 2000. Development of rabbit parthenogenetic oocytes and nuclear-transferred oocytes receiving cultured cumulus cells. *Theriogenology*. 54: 1469-1476.
- Yoshioka, K., A.M. Othman, T. Taniguchi, H. Yamanaka and K. Sekikawa. 1997. Differential patterns of blastulation in bovine morulae cultured in synthetic oviduct fluid medium containing FCS or BSA. *Theriogenology*. 48: 997-1006.
- Yoshioka, K., C. Suzuki, A. Tanaka, I.M. Anas and S. Iwamura. 2002. Birth of piglets derived from porcine zygotes cultured in a chemically defined medium. *Biology of Reproduction*. 66: 112-119.
- Yoshioka, K., C. Suzuki and A. Onishi. 2008. Defined system for *in vitro* production of porcine embryos using a single basic medium. *Journal of Reproduction and Development*. 54 (3): 208-213.
- Younis, A.I., B.G. Brackett and R.A. Fayrer-Hosken. 1989. Influence of serum and hormones on maturation and fertilization of bovine oocytes *in vitro*. *Gamete Research*. 23: 189-201.
- Younis, A.I. and B.G. Brackett. 1991a. Importance of cumulus cells and insemination interval for development of bovine oocytes into morulae and blastocysts *in vitro*. *Theriogenology*. 36: 11-21.
- Younis, A.I. and B.G. Brackett. 1991b. Importance of cumulus cells and insemination interval for development of bovine oocyte maturation, fertilization, and embryo development *in vitro*. *Molecular Reproduction and Development*. 40: 338-344.
- Younis, A.I., K.A. Zuelke, K.M. Harper, M.A.L. Oliveira and B.G. Brackett. 1991c. *In vitro* fertilization of goat oocytes. *Biology of Reproduction*. 44: 1177-1182.
- Younis, A.I., L. Keskintepe, K. Mackie and B.G. Brackett. 1992. *In vitro* maturation and fertilization of Toggenburg goat oocytes. *Theriogenology*. 37: 330.

- Yuan, Y.Q., A. Van Soom, F.O.J. Coopman, K. Mintiens, M.L. Boerjan, A. Van Zeveren, A. de Kruif and L.J. Peelman. 2003. Influence of oxygen tension on apoptosis and hatching in bovine embryos cultured *in vitro*. *Theriogenology*. 59: 1585-1596.
- Yuan, Y., A. Van Soom, J.L. Leroy, J. Dewulf, A. Van Zeveren, A. de Kruif and L. Peelman. 2005. Apoptosis in cumulus cells, but not in oocytes, may influence bovine embryonic developmental competence. *Theriogenology*. 63: 2147-2163.
- Yuswiati, E. and W. Holtz. 1990. Successful transfer of vitrified goat embryos. *Theriogenology*. 34: 629-632.
- Zakhartchenko, V., G. Durcova-Hills, M. Stojkovic, W. Scherthaner, K. Prella, R. Steinborn, M. Müller, G. Brem and E. Wolf. 1999. Effects of serum starvation and re-cloning on the efficiency of nuclear transfer using bovine fetal fibroblasts. *Journal of Reproduction and Fertility*. 115: 325-331.
- Zarazaga, L.A., M.C.Gatica, I.Celi, J.L.Guzmán and B.Malpoux. 2011. Artificial long days and daily contact with bucks induce ovarian but not oestrous activity during the non-breeding season in Mediterranean goat females. *Animal Reproduction Science*. 125 (1-4): 81-87.
- Zarkawi, M., M.R. Al-Merestani and M.F. Wardeh. 1999. Induction of synchronized estrus in indigenous Damascus goats outside the breeding season. *Small Ruminant Research*. 33: 193-197.
- Zeuner, A., K. Muller, K. Reguszynski and K. Jewgenow. 2003. Apoptosis within bovine follicular cells and its effect on oocyte development during *in vitro* maturation. *Theriogenology*. 59: 1421-1433.
- Zhang, L., S. Jiang, P.J. Wozniak, X. Yang and R.A. Godke. 1995. Cumulus cell function during bovine oocyte maturation, fertilization and embryo development *in vitro*. *Molecular Reproduction and Development*. 40: 338-344.
- Zhang, Y. and Y. Li. 1998. Nuclear-cytoplasmic interactions and development of goat embryos reconstructed by nuclear transplantation: Production of goats by serially cloning embryos. *Biology of Reproduction*. 58: 266-269.
- Zhang, D., L. Pan, L.H. Yang, X.K. He, X.Y. Huang and F.Z. Sun. 2005. Strontium promotes calcium oscillations in mouse meiotic oocytes and early embryos through InsP3 receptors, and requires activation of phospholipase and the synergistic action of InsP3. *Human Reproduction*. 20: 3053-3061.
- Zhang, X., Y. Han, H. Sui, D. Miao, J. Wang, K. Li and J. Tan. 2008. Developmental and hormonal regulation of cumulus expansion and secretion of cumulus expansion-enabling factor (CEEF) in goat follicles. *Molecular Reproduction and Development*. 75: 1387-1395.
- Zhu, J., E.E. Telfer, J. Fletcher, A. Springbett, J.R. Dobrinsky, P.A. De Sousa and I. Wilmut. 2002. Improvement of an electrical activation protocol for porcine oocytes. *Biology of Reproduction*. 66: 635-641.
- Ziomeck, C.A. and M.H. Johnson. 1980. Cell surface interaction induces polarization of mouse 8-cell blastomeres at compaction. *Cell*. 21:935-942.