

DAFTAR PUSTAKA

- Achmadi U.F.,2011. *Dasar-dasar Penyakit Berbasis Lingkungan*. Rajawali Press. Divisi Buku Perguruan Tinggi PT. Raja Grafindo Persada.Jakarta.
- Afaf, D., Abdel-Mageid, Omnia, M., Abdel-Hamid, Olla, Talkhan, F.A. &Abeer, A.A. 2009. Biochemical and hematological effects of electromagnetic field on male rats. *EJBMB*23(5): 369-77.
- Agarwal A., Desai N.R., Makker K., Varghese A., Mouradi R., Sabanegh E., &Sharma R. 2009. Effects of radiofrequency electromagnetic waves (RF-EMW) from cellular phones on human ejaculated semen: an *in vitro* pilot study. *Fertil Steril* 92(4):1318-25.
- Agarwal A., Saleh R.A. &Bedaiwy M.A. 2003. Role of reactive oxygen species in the Pathophysiology of human reproduction. *Fertil Steril* 79 (4): 829-43.
- Agarwal A.& Said T.M., 2005. Oxidative stress, DNA damage and apoptosis in male infertility: a clinical approach, *BJU Internat* 95:503-507
- Agarwal, A., &Hamada, A. 2012. Unexplained Male infertility : Diagnosis and Management. *Int Braz J Urol* 38 (5). Retrieved from http://www.brazjurol.com.br/september-october-2012/Hamada_576_594.pdf.
- Agarwal, A., Deepinder, F., & Sharma, R.K. 2007. Effect of cell phone, usage on semen analysis in men attending infertility clinic: an observational study. *JFertilSteril* 59: 329-43.
- Agarwal, A., Aspinder S., Alla, H.& Kavindra, K. 2011. Cell phones and Male infertility : A review of recent innovations in technology and consequences. *Int Braz J Urol* vol 37 (4) : 432-454, July-August.
- Ahmad L. &Baig N.M.,2011. Mobile phone RF-EMF Exposure to Human Spermatozoa : An *in vitro* Study. *Pakistan J. Zool* 43 (6), 1147-1154.
- Alavi S.M.& Cosson J. 2006. Sperm motility in fishes. (II)Effects of ions and osmolality: a review. *Cell Biol Int* 30: 1-14
- Almeida, C., Cardoso, M.F.,Sousa, M., Viana, P., Gocalves, A., Sliva, J. *et al* 2005. Quantitative study of caspase-3 activity in semen and after swio-up preparation in relation to sperm quality. *Hum Reprod* 20, 1307-13.
- Anderson V &Rowley J. 2007. Measurements of skin surface temperature during mobile phone use. *Bioelectromagnetics* 28: 159-62.
- Anzar M., He L., Buhr M.M., Kroetsch T.G. &Paul K.P. 2002. Sperm apoptosis in fresh and cryopreserved bull semen detected by flow cytometry and its relationship with fertility. *Biol Reprod* 66: 354–60.
- Amarudin, 2012. Pengaruh Merokok terhadap Kualitas Sperma pada Pria dengan Masalah Infertil Studi Kasus Kontrol di Jakarta Tahun 2011.*Thesis*. Fakultas Kesehatan Masyarakat. Program Pasca Sarjana Universitas Indonesia Depok.
- Asmarinah, 2010. Peran molekul kanal ion pada fungsi spermatozoa. *Maj Kedokt Indon* 60(8), Agustus.

- Atasoy, A., Sevim,Y., Kaya, Yilmaz, M., Durmus, A., Sonmez, M., *et al.* 2009. Thee effect of electromagnetic fields on periperal blood mononuclear cell in vitro.*Brtis Lek List* 110 (9): 526-9.
- Aziz N., Said T., Paasch U. &Agarwal A. 2007. The relationship between human the sperm deformity index. *Hum Repro* 22:1413-9.
- Bajpai, M. & Doncel, G.F. 2003. Involvement of tyrosine kinase and cAMP-dependent kinase cross-talk in the regulation of human sperm motility. *Reprod* 126, 183-195
- Baker, M.A., Hetherington, L., Ecroyd, S.D., Roman,R.J., &Aitken. 2004. Analysis of the mechanism by which calcium negatively regulates the tyrosine phosphorylation cascade associated with sperm capacitation. *J Cell Sci* 117,211-222
- Balci M., Devrim E. &Durak I. 2007. Effects of mobile phones on oxidant/antioxidant balance in cornea and lens of rats. *Curr Eye Res* 32: 21-5.
- Baldi E., Luconi M., Muratori M., Marchiani S., Tamburrino L., Forti G. 2009. Nongenomic activation of spermatozoa by steroid hormones: facts and fictions. *Mol Cell Endocrinol* 308:39-46.
- Barroso, G., Morshedi, M. &Oehninger, S. 2000. Analysis of DNA fragetation, plasma membrane translocation of phosphatidylserine and oxidative stressin human spermatozoa. *Hum Reprod* 15, 1338-44.
- Blackmore, P.F., 1993. Thapsigargin elevates and potentiate the ability of progesterone to increase intracellular free calcium in human sperm : possible role of perinuclear calcium. *Cell Calcium* 14.53-60.
- Baste V., Riise T. &Moen B.E. 2008. Radiofrequency electromagnetic fields; male infertility and sex ratio of offspring. *Eur J Epidemiol* 23(5):369-77.
- Buffone, M.G., Calamera, J.C. , Verstraeten, S.V. &Doncel, G.F. 2005. Capacitation-associated protein tyrosine phosphorylation and membrane fluidity changes are impaired in the spermatozoa of asthenozoospermic patients. *Reprod* 129,697-705
- Carlson A.E., Burnett L.A, del Camino D., Quill T.A., Hille B., Chong J.A., Moran M.M., Babcock D.F. 2009. Pharmacological targeting of native CatSper channels reveals a required role in maintenance of sperm hyperactivation. *PLoS One* 4:e6844.
- Castellano, L.E., Trevino, D., Rodriguez, C.J., Serrano, J., Pacheco, V., Tsutsumi, R., *et al.* 2003. Transient Receptor Potensial (TRPC) channels in humn sperm: expression, cellular localization, and involvement in the regulation of flagellar motility, *FEBS lett* 541, 69-74.
- Cayli S., Sakkas D., Vigue L., Demir R. &Huszar G. 2004.Cellular maturity and apoptosis in human sperm: creatine kinase, caspase-3 and Bcl-XL levels in mature and diminished maturity sperm. *Mol Hum Reprod* 10: 365-72.
- Ceruti S., Beltrami E., Matarrese P., Mazzola A., Cattabeni F., Malorni W., *et al.* 2003. A key role for caspase-2 and caspase-3 in the apoptosis induced by 2-chloro-2'-deoxyadenosine (cladribine) and 2-chloro-adenosine in human astrocytoma cells. *Mol Pharmacol* 63: 1437-47.

- Chen Z., Hauser R., Trbovich A.M., Shifren J.L., Dorer D.J. & Godfrey-Bailey L. 2006. Relationship Between Human Semen Characteristics and Sperm Apoptosis : A Pilot Study, *J Androl* 27:1: 112-120.
- Cheng C. 2005. Shear stress affect the intracellular distribution of eNOS : direct demonstration by a novel in vivo technique. *Blood* 26 :3691-3698.
- Colin A., Barroso G., Gómez-López N., Duran E.H., & Oehninger S. 2010. The effect of age on the expression of apoptosis biomarkers in human spermatozoa. *Fertil Steril* 94:2609-14.
- Dahlan, S. 2009. *Statistik untuk Kedokteran dan Kesehatan. Deskriptif, Bivariat, dan Multivariat*. Edisi 4. Penerbit Salemba Medika.
- Dasdag S., Ketani M.A., Akdag Z., Ersay A.R., Sari I., Demirtas O.C., *et al.* 1999. Whole-body microwave exposure emitted by cellular phones and testicular function of rats. *Urol Res* 27: 219-23.
- Davoudi M., Brossner C. & Kuber W. 2002. The influence of electromagnetic waves on sperm motility. *Urol Urogynacol* 19(22):342-51.
- De Iuliis G.N., Newey R.J., King B.V., & Aitken R.J. 2009. Mobile phone radiation induces reactive oxygen species production and DNA damage in human spermatozoa in vitro. *PLoS One* 4: e6446. 21.
- dePomerai, D., Danniels, C., David, Allan, J., Duce, I., Mutwakil, M., *et al.* 2000. Non-Thermal heat-shock response to microwave. *Nature* 405:417-418.
- Desai N.R., Kesari K.K. & Agarwal A. 2009. Pathophysiology of cell phone radiation: oxidative stress and carcinogenesis with focus on male reproductive system. *Reprod Biol Endocrinol* 7 : 114-123.
- Deshpande, S.S., Angkeow, P., Huang, J., Ozaki, M., & Irani, K. 2000. Rac1 Inhibits TNF- α -Induced Endothelial Cell Apoptosis: Dual Regulation by Reactive Oxygen Species. *FASEB J* 14 : 1705-1714
- Di Zhang & Murali, G. 2005. Sperm Ion Channels: Review Molecular Targets for The Next Generation of Contraceptive Medicines? *J Androl* 26 (6).
- Dufau, M.L., Tinajero, J.C. & Fabbri, A. 1993. Corticotropin-releasing factor: an antireproductive hormone of the testis. *FASEB J* 1993 Feb 1;7(2):299-307
- EduMed, 2010. *Non-Ionizing Electromagnetic Radiation in the Radiofrequency Spectrum and its effects on Human Health*. Intituto EduMed.
- El-Melegy N.T. & Ali M.E. 2011. Apoptotic markers in semen of infertile men: Association with cigarette smoking. *Int Braz J Urol* 37:495-506.
- Elisabetta B. Michaela L. Csilla K. & Gianni F. 2011. Progesterone and spermatozoa: a long-lasting liaison comes to definition. *Hum Reprod* Advance Access published September 7, 2011 Vol.0, No.0 pp. 1-2.
- Erogul, O., Oztas, E., Yildirim, I. *et al.* 2006. Effects of electromagnetic radiation. Study of apoptotic DNA fragmentation in human spermatozoa. *Hum Reprod* 15,830-0.
- Esposito G., B. S. Jaiswal, F. Xie *et al.*, 2004. Ice deficient for soluble adenylyl cyclase are infertile because of a severe sperm-motility defect, *Proceedings of the National Academy of Sciences of the United States of America*, vol. 101, no. 9, pp. 2993-2998, 2004.

- Falzone N., Huyser C., Franken D.R. & Leszczynski D. 2010. Mobile phone radiation does not induce pro-apoptosis effects in human spermatozoa. *Radiat Res* 174: 169-76.
- Fang H.H., Zeng G.Y., Nie Q., *et al.*, 2010. Effects on structure and secretion of pituitary gland in rats after electromagnetic pulse exposure. *Zhonghua Yi Xue Za Zhi* 90 : 3231-4.
- Fejes I., Závaczki Z., Szöllosi J., Koloszá S., Daru J., Kovács L., *et al.* 2005. Is there a relationship between cell phone use and semen quality? *Arch Androl* 51: 385-93.
- Feyyaz, Ozdemir & Aysegul, K. 2011. *Electromagnetic Waves and Human Health* 22 : 473-479. The Edumed Institute for Education in Medicine and Health Independent Research Group on the Impacts of Mobile Technologies on Health
- Ficarro S., O., Chertihin, V.A., Westbrook, F. White, F. Jayes, P. Kalab, J.A. *et al.* 2003. Phosphoproteome analysis of capacitated human spermatozoa. *J Biol Chem* 278, 11579-11589.
- Florman H.M., 1994. Sequential focal and global elevations of sperm intracellular Ca²⁺ are initiated by the zona pellucida during acrosomal exocytosis. *Developmental Biology* 165 (1) : 152–164.
- Foresta, C. & Rossato, M., 1997. Calcium influx pathways in human spermatozoa. *Mol Hum Reprod* vol 3, no. 1, pp. 1-4.
- Frank, E. G., & Jerome, J.P. 1980. *Introduction to Environmental Toxicology*. free-radical processes in rat liver and kidney. *Electro Biol and Med* 19 (1) : 99-105.
- Friedman J., Kraus S., Hauptman Y., Schiff Y., & Seger R. 2007. Mechanism of short-term ERK activation by electromagnetic fields at mobile phone frequencies. *Biochem J* 405: 559-68.
- Gandini L., Lombardo F., Paoli D., Caponecchia L., Familiari G., Verlengia C., Dondero F. & Lenzi A. 2000. Study of apoptotic DNA fragmentation in human spermatozoa. *Hum Reprod* 15: 830–839.
- Ganong W.F. 2003. Gonad : perkembangan dan fungsi sistem reproduksi. Dalam : *Buku Ajar Fisiologi Kedokteran*. Edisi 20. Jakarta : EGC, h. 408-416.
- Goldsworthy A. 2007. *The Biological Effects of Weak Electromagnetic Fields*. [cited 2011 Feb 11]. Available from: Web site: http://www.hese-project.org/hese-uk/en/papers/goldsworthy_bio_weak_em_07.pdf
- Gonzalez, C., Michelangeli, F., Harper, C.V., Barratt, C.L.R. & Publicover, S.J. 2006. Calcium signalling in human spermatozoa: a specialized toolkit of channels, transporters and stores. *Hum Reprod Update* 12 (3) : 253–267.
- Grunewald S., Said T.M., Paasch U., Glander H.J. & Agarwal A. 2007. Relationship between sperm apoptosis signalling and oocyte penetration capacity. *Int J Androl* 15 (2) : 341-46.
- Gunther, W., Donner, F., Babcock, & Bertil, H. 2003. Calcium Clearance Mechanisms of Mouse Sperm. *J Gen Physiol* July 122(1): 115–128. Guyton, A.C, & Hall, J.E., 2006. *Textbook of Medical Physiology*. 11th ed. Elsevier Inc. Philadelphia, Pennsylvania, pp 522-524.

- Gye M.C. & Park C.J., 2012. Effect of Electromagnetic Field Exposure on the Reproductive System. *Clin Exp Reprod Med* 39 (1): 1-9.
- Hadi R.S. 2011. Apoptosis Pada Sperma Sebagai Petanda Adanya Gangguan Kesuburan Pria. *Majalah Kesehatan PharmaMedika* 3 (2).
- Hamada A.J., Singh A., & Agarwal A. 2011. Cell Phone and their Impact on Male Fertility : Fact or Fiction. *The Open Reproductive Science Journal* 5 : 125-137.
- Hess K.C., B.H. Jones, B. Marquez et al., 2005. The soluble adenylyl cyclase in sperm mediates multiple signaling events required for fertilization. *Developmental Cell* 9 (2) : 249–259.
- Ho H.C. & Suarez, S.S. 2001. An inositol 1,4,5-triphosphatase receptor-gated intracellular Ca^{2+} store is involved in regulating sperm hyperactivated motility. *Biol Reprod* 65 : 1606-1615.
- Hong C.Y., Chiang B.N., & Turner P. 1984. Calcium ion is the key regulator of human sperm function. *Lancet* 2: 1449-51.
- Hong-Gang Li, Ai-Hua L., Xiao-Fang D., Hui Z., & Cheng-Liang X. 2006. The expression and significance of CATSPER1 in human testis and ejaculated spermatozoa. *Asian J Androl* 8 (3): 301–306.
- Ignoz, G.G. & Suarez, P. 2005. calcium/calmodulin and calmodulin kinase II Stimulate Hyperactivation in Demembrated bovine sperm. *Biol Reprod* 73 : 519-526.
- Jaiswal B.S., and Eisenbach M., 2002. Capacitation San Diego: Academic Press; pp. 57-117.
- Jensen M.B., Bjerrum P.J., Jessen T.E., Nielsen J.E., & Joensen U.N. 2011. Vitamin D is positively associated with sperm motility and increases intracellular calcium in human spermatozoa. *Hum Reprod* 26 (6): 1307-17.
- Jung A. & Schill W.B. 2000. Male infertility. Current life style could be responsible for infertility. *MMW Fortschr Med* 42: 31-3.
- Kavindra, Kumar, K. & Sanjay, K. 2011. Effects of Radiofrequency Electromagnetic Wave Exposure from Cellular Phones on the Reproductive Pattern in Male Wistar Rats. *Appl Biochem Biotechnol* 164 : 546-559.
- Kesari K.K., Kumar S., & Behari J. 2011. Effects of Radiofrequency Electromagnetic Wave Exposure from Cellular Phones on the Reproductive Pattern in Male Wistar Rats. *Appl Biochem Biotechnol* 15.
- Kesari K.K., Kumar S. & Behari J. 2010. Mobile phone usage and male infertility in Wistar rats. *Indian J Exp Biol* 48: 987-92.
- Kramer, P.H. 2000. CD95's Deadly Mission in the Immune System. *Nature* 407:789-795.
- Kumar S., Kesari K.K., & Behari J. 2010. Evaluation of genotoxic effects in male Wistar rats following microwave exposure. *Indian J Exp Biol* 48: 586-92.
- Kumar S., Kesari K.K., & Behari J. 2011. Influence of microwave exposure on fertility of male rats. *Fertil Steril* 95: 1500-2.

- Larsson C. 2008. New insights into PKC family affairs:three novel phosphorylation sites in PKCepsilon and at least one is regulated by PKCalpha. *Biochem J* 411: 15-6.
- Leblond, C.P. & Clermont, Y. 1972. Spermatogenesis of rat, mouse, hamster and Effects of 60 Hz electromagnetic field exposure on testicular germ cell apoptosis in mice. *Asian J Androl* 6: 29-34.
- Leszczynski, D., Joenvaara, S., Reivinen, J. & Kuokka, R., 2002. Non-thermal: Mechanism of spontaneous inside-out vesiculation of red cell membranes. *J Cell Biol* 106: 1893-901.
- Liu D.Y., Clarke G.N., Martic M., Garret C., & Baker H.W. 2001. Frequency of disordered zona pellucid (ZP) –induced acrosome reaction in infertile men with normal semen analysis and normal spermatozoa-ZP binding. *Hum Reprod* 16 :1185-11190.
- Lishko P.V., Botchkina I.L. & Kirichok Y. 2011. Progesterone activates the principal Ca²⁺ channel of human sperm. *Nature* 471:387-391.
- Luconi, M. & Baldi, E. 1996. How do sperm swim ? molecular mechanisms underlying sperm motility : *Cell Mol Biol* 49 : 357-369.
- Maneesh, M., Anil, P.K., Jayalekshmi, H., Bargav, K., & Rohith, V. 2009. Radiofrequency electromagnetic radiation (RF-EMR) from GSM (0.9/1.8 GJZ) mobile phones induces oxidative stress and reduces sperm motility in rats. *Clinics* 64(6) : 561-5.
- Marchetti C., Gallego M.A., Defossez A., Formstecher P. & Marchetti P. 2004a. Staining of human sperm with fluorochromelabeled inhibitor of caspases to detect activated caspases: correlation with apoptosis and sperm parameters. *Hum Reprod* 19: 1127–34.
- Marchetti C., Obert G., Deffossez A., Formstecher P. & Marchetti P. 2004b; Study of mitochondrial membrane potential, reactive oxygen species, DNA fragmentation and cell viability by flow cytometry in human sperm. *Hum Reprod* 17: 1257–65.
- Marin, Briggiler, C.I., Jha O., Chertihin, M.G., Buffone, J.C., Herr, M.H., Vasquez, Levin, P.E., & Visconti. 2005. Evidence of the presence of calcium/calmodulin-dependent protein kinase IV in human sperm and its involvement in motility regulation. *J Cell Sci* 118 : 2013-2022.
- Mannowetz N., N. M. Naidoo, S.-A. Choo, J. F. Smith, and P.V. Lishko. 2013. Slo1 is the principal potassium channel of human spermatozoa. *eLife*, vol. 2, Article ID e01009, 2013.
- Meizel, S. & Turner, K.O., 1993. Initiation of the human acrosome reaction by thapsigargin, *J Exp Zool* 267 : 350-355.
- Meizel S., Turner K.O., Nuccitelli R. 1997. Progesterone triggers a wave of increased free calcium during the human sperm acrosome reaction. *Dev Biol* 182:67-75.
- Milani, M., Balerini, M., Ferraro, I., Zabeo, M., Barberis, M., Cannona, M. & Faleri, M., 2001. Magnetic fields effects on human lymphocytes. Electromagnetic field effect on human lymphocytes. *Electro Biol and Med* 20 (1) : 82-106.

- Mohammadi, S., Jalali, M., Nikraves, M.R., Gholamin, M., Fazel A., Ebrahimzadeh, A., & Sankian, M. 2013. Effects of L- carnitine treatment on expression of CatSper proteins in the aging mouse model. *European Journal of Experimental Biology* 3 (3) : 731-735
- Morelli, A., Ravera, S. Panfoli, I. & Pepe, I.M. 2005. Effects of extremely low motility in striped bass via a cAMP-independent pathway. *Theriogenology* 61: 1487-1498.
- Mouradi RD, Nisarg; Erdemir, Ahmet; Agarwal, & Ashok. 2011. *The Use of FDTD in establishing In-vitro experimentation conditions representative of lifelike cell phone radiation on the spermatozoa*. (Unpublished observation).
- Moustafa Y.M., Moustafa R.M., Belacy A., Abou-E.E.S.H., & Ali F.M. 2001. Effects of acute exposure to the radiofrequency fields of cellular phones on plasma lipid peroxide and antioxidant activities in human erythrocytes. *J Pharm Biomed Anal* 26: 605-8.
- Mycek, Mary, J., Richard, A., Havey, Pamela, C., Champe, Bruce, D., & Fisher. 2001. *Farmakologi*. Ulasan Bergambar Edisi 2. Alih Bahasa : Azwar Agoes. Widya Medika, Jakarta : 274-275.
- Naor Z., & Breitbart H. 1997. Protein kinase C and mammalian spermatozoa acrosome reaction. *Trends Endocrinol Metab* 8: 337-42.
- Nieschlag, E., & Behre, H.M. 1990. *Testosterone Action Deficiency Substitution*. Berlin London. Tokyo. New York.
- Nordøy A., Børnaa K.H., Nilsen H., Berge R.K., Hansen J.B., Ingebretsen O.C. 1998. Effects of Simvastatin and omega-3 fatty acids on plasma lipoproteins and lipid peroxidation in patients with combined hyperlipidaemia. *J Intern Med* 243 (2): 163-70
- Nylund R., Leszczynski D., Joenväärä S., & Reivinen J. 2004. Applicability of discovery science approach to determine biological effects of mobile phone radiation. *Proteomics* 4: 426-31.
- Oehninger S., Morshedi M., Weng S.L., Taylor S., Duran H., & Beebe S. 2003. Presence and significance of somatic cell apoptosis markers in human ejaculated spermatozoa. *Reprod Biomed Online* 7: 469-76.
- Oehninger S, Sueldo C, Lanzendorf S, Mahony M, Burkman LJ, Alexander NJ, Hodgen GD. 1994. A sequential analysis of the effect of progesterone on specific sperm functions crucial to fertilization in vitro in infertile patients. *Hum Reprod* 9:1322-1327.
- Oktem F., Ozguner F., Mollaoglu H., Koyu A., & Uz E. 2006. Oxidative damage in the kidney induced by semen analysis in men attending infertility clinic: an observational study. *J. Fertility and Sterility* 6 : 221-29.
- Oral B., Guney M., Ozguner F., Karahan N., Mungan T., Comlekci S., et al. 2006. Endometrial apoptosis induced by a 900-MHz mobile phone: preventive effects of vitamins E and C. *Adv Ther* 23: 957-73.

- Otitolaju A.A., Obe I.A., Adewale O.A., Otubanjo O.A., & Osunkalu V.O., 2010. Preliminary Study on the Induction of Sperm Head Abnormalities in Mice, *Mus musculus*, Exposed to Radiofrequency Radiations from Global System for Mobile Communication Base Stations. *Bull Environ Contam Toxicol* 84:51–54. DOI 10.1007/s00128-009-9894-2.
- O'Toole CM, Arnoult C, Darszon A, Steinhardt RA, Florman HM. 2000. Ca(2+) entry through store-operated channels in mouse sperm is initiated by egg ZP3 and drives the acrosome reaction. *Mol Biol Cell* 11:1571-1584
- Ozguner F., Bardak Y., & Comlekci S. 2006. Protective effects of melatonin and caffeic acid phenethyl ester against retinal oxidative stress in long-term use of mobile phone: a comparative study. *Mol Cell Biochem* 282: 83-8.
- Paul S.P. 2011. *Komunikasi Sel dalam Biologi Molekular. Jalur Sinyal dan Implikasi Klinis*. Penerbit Buku Kedokteran EGC. Jakarta.
- Paasch U., Grunewald S., Dathe S., & Glander H.J. 2004. Mitochondria of human Spermatozoa are preferentially susceptible to apoptosis. *Ann N Y Acad Sci* 1030: 403–9.
- Paksy, K., Thuroczy, G., Forgacs, Z., Lazar, P. & Gaati, I., 2000. Influence of sinusoidal 50-Hz magnetic field on cultured human ovarian granulosa cells *Electro Biol and Med J* 19 (1) : 95-99.
- Pentikäinen V., 2002. Regulation of male germ cell apoptosis : Roles of sex steroids and the cellular death receptors Fas and TNFR1. *Dissertation*. Programme for Developmental and Reproductive Biology Biomedicum, Helsinki University of Helsinki, Finlanda.
- Pommier Y., Sordet O., Antony S., Hayward R.L., & Kohn K.W. 2004. Apoptosis defects and chemotherapy resistance: molecular interaction maps and networks. *Oncogene* 23: 2934-49.
- Qadrijati, I. 2002. Kuantitas dan Kualitas Sel Darah Putih Manusia yang Bermukim di Bawah SUTET. *Thesis*. Program Pascasarjana Universitas Gadjah Mada Yogyakarta.
- Qadrijati I. & Farah R., 2007. Pengaruh Paparan Radiasi Gelombang Elektromagnetik Frekuensi Ekstrem Rendah Terhadap Perkembangan Folikel Ovarium Mencit (*Mus Musculus*). *Penelitian DIPA FK UNS*. Fakultas Kedokteran Universitas Sebelas Maret Surakarta.
- Qadrijati, I. & Veronika, D. 2007. Pengaruh Paparan Radiasi Gelombang Elektromagnetik Frekuensi Ekstrem Rendah Terhadap Sel Darah Putih Mencit (*Mus Musculus*). *Penelitian DIPA FK UNS*. Fakultas Kedokteran Universitas Sebelas Maret Surakarta.
- Rahman S., Kwon W.S., and Pang M.G. 2014. Calcium Influx and Male Fertility in the Context of the Sperm Proteome: An Update. *Review Article. BioMed Research Int* ID 841615, 13 pages <http://dx.doi.org/10.1155/2014/841615>
- Reed J.C. 2000. Mechanisms of Apoptosis, *Am J Pathol* 157 : 1415-1430.
- Ren D. & Xia J. 2010. Calcium Signaling Through CatSper Channels in Mammalian Fertilization. *Physiology* 25 (3): 165-175 (DOI: 10.1152/physiol.00049.2009)

- Ribeiro E.P., Rhoden E.L., Horn M.M., Rhoden C., Lima L.P., & Toniolo L. 2007. Effects of subchronic exposure to radio frequency from a conventional cellular telephone on testicular function in adult rats. *J Urol* 177: 395-9.
- Ricci, G., Perticarari, S., Fragona, E., Giolo, E. S., Canova, C., Pozzobon, S., Guaschino & Presani, G. 2002. Apoptosis in human sperm: its correlation with semen quality and the presence of leukocytes. *Hum Reprod* 17(10): 2665-2672.
- Robert, F., Cleveland, Jerry, L. & Ulcek. 1999. *Questions and Answers about Biological Effects and Potential Hazard of Radiofrequency Electromagnetic Fields*. Oet Bulletin 56, Fourth edition, Washington DC.
- Riedl SJ & Shi Y. 2004. Molecular mechanisms of caspase regulation during apoptosis. *Nat Rev Mol Cell Biol* 5: 897-907.
- Rotem R, Paz GF, Homonnai ZT, Kalina M, & Naor Z (b) 1990. Protein kinase C is present in human sperm: possible role in flagellar motility. *Proc Natl Acad Sci U S A* 87: 7305-8.
- Said T., Agarwal A., Grunewald S., Rasch M., Baumann T., Kriegel C., *et al.* 2006. Selection of nonapoptotic spermatozoa as a new tool for enhancing assisted reproduction outcomes: an *in vitro* model. *Biol Reprod* 74: 530-7.
- Said T.M., Gaglani A., & Agarwal A. 2010. Implication of apoptosis in sperm cryoinjury. *Reprod Biomed Online* 21:456-62.
- Said T.M., Paasch U., & Glander H.J. 2004. Agarwal A. Role of caspases in male infertility. *Hum Reprod* 10: 39 -51.
- Sakkas D., Mariethoz E., & St. John J.C. 1999. Abnormal sperm parameters in humans are indicative of an abortive apoptotic mechanism linked to the Fas-mediated pathway. *Exp Cell Res* 251: 350 -355
- Sakkas D., Moffatt O., Manicardi G.C., Mariethoz E., Tarozzi N. & Bizzaro D. 2002. Nature of DNA damage in ejaculated human spermatozoa and the possible involvement of apoptosis. *Biol Reprod* 66:1061-1067.
- Salama N., Kishimoto T., Kanayama H.O. & Kagawa S. 2009. The mobile phone decreases fructose but not citrate in rabbit semen: a longitudinal study. *Syst Biol Reprod Med* 55: 181-7.
- Schuffner A.A., Bastiaan H.S., Duran H.E., Lin Z.Y, Morshedi M., Franken D.R & Oehninger S. 2002. Zona pellucida-induced acrosome reaction in human sperm: dependency on activation of pertussis toxin-sensitive G(i) protein and extracellular calcium, and priming effect of progesterone and follicular fluid. *Mol Hum Reprod* 8:722-727.
- Schuh, K., Cartwright, E.J. , Jankevics, E., Bundschu, K., Liebermann, J., Williams, J.C. *et al.* 2004. Plasma membrane Ca²⁺ ATPase 4 is required for sperm motility and male fertility. *J Biol Chem* 279: 28220-28226.
- Shaha, C., 2007. Modulators of spermatogenic cell survival. *Soc Reprod Fertil Suppl* 63:173-86.
- Sharoare H., Johannisson A., Wallgren M., Nagy S., Siqueira A.P., & Rodriguez-Martinez H. 2011. Flowcytometry for the assessment of animal sperm integrity and functionality: state of the art., *Asian Journal of Andrology* 13(3): 406-419.

- Shukla K.K., Mahdi A.A., & Rajender S. 2012. Apoptosis, spermatogenesis and male infertility. *Front Biosci (Elite Ed)* 4:746-54.
- Shun L.W., Steven, L., Taylor, Mahmood, M., Alessandro, S., Hakan, D.E., Stephen, B., & Sergio, O. 2002. Caspase activity and apoptotic markers in ejaculated human sperm. *Mol Hum Reprod* 8 (10) : 984-991.
- Shunyang H., Keeran K.J. & Woods L.C., 2004. Activation of sperm motility in striped bass via a cAMP-independent pathway. *Theriogenology* 61:1487-1498.
- Siddighi S., Patton W.C., Jacobson J.D., King A., & Chan P.J. 2004. Correlation of sperm parameters with apoptosis assessed by dual fluorescence DNA integrity assay. *Arch Androl* 50:311-314.
- Smith J.F., Syrityna O., Fellous M., Serres C., Mannowetz N., Kirichok Y. & Lishko P.V. 2013. Disruption of the principal, progesterone-activated sperm Ca²⁺ channel in a CatSper2-deficient infertile patient. *Proc Natl Acad Sci USA* 110:6823-6828
- Soeradi, O. 1990. Protein Pengikat Androgen dan Spermatogenesis. *Majalah Kedok Indon*, 28: 62-66
- Sonja G., Manja R., Martin R., Thomas B., Uwe P. & Hans J.G.. 2008. Stability of fluorochrome based assays to measure subcellular sperm functions. *Asian J Androl* 2008; 10 (3): 455-459
- Spierings D., McStay G., Saleh M., Bender C., Chipuk J., Maurer U., *et al.* 2005. Connected to death: the (unexpurgated) mitochondrial pathway of apoptosis. *Science* 310: 66-7.
- Stefan S. & Florian L. 2013. *Color Atlas of Pathophysiology*. Rudigerstrabe 14, Stuttgart, Germany.
- Strunker T., Goodwin N., Brenker C., Kashikar N.D., Weyand I., Seifert R. & Kaupp U.B. 2011. The CatSper channel mediates progesterone-induced Ca²⁺ influx in human sperm. *Nature* 471:382-386
- Sumigama S., Mansell S., Miller M., Lishko P.V., Cherr G.N., Meyers S.A., and Tollner T. 2015. Progesterone accelerates the completion of sperm capacitation and activates CatSper channel in spermatozoa from the rhesus macaque. BOR Papers in Press. Published on October 21, 2015 as DOI:10.1095/biolreprod.115.129783
- Susilowati, S. 2011. Effect of Centrifugation of Goat Semen to Free Radical Concentrate on Washing Medium. *Media Veterinaria Medika* 4 (2).
- Tahmineh, P., Gholamhossein, F., Jafar, S.R., & Marefat, G.N. 2007. Vitrification induced apoptosis in spermatozoa from fertile and subfertile men. *Iranian J Reprod Med* 5 (3) :117-120.
- Takashi, K., Kaneko, I., Date, M., & Fukada, E., 1986. Effect of pulsing electromagnetic fields on DNA synthesis in mammalian cells in culture. *Cell and Mol Life Sci* 42 (2) : 185-186.
- Tauhid, N.A., 2008. *Dasar-dasar Biologi Molekuler. Menelusuri Jejak Hayati dari Asam Nucleat ke Protein dan Keajaiban Bioteknologi*. Bandung : Widya Padjadjaran.

- Tian, F., Lisi, A., Yoshida, M., Honda, N., Hirose, H., & Miyakoshi, J. 2002. Exposure to power frequency magnetic fields suppresses X-ray-induced apoptosis transiently in Ku80-deficient xrs5 cells. *Biochem and Biophysical Research Comm* 292 (2) : 355-361.
- Timothy, A.Q., Dejian, R., David, E.C., & David L.G., 2001. A Voltage-gated ion channel expressed specifically in spermatozoa. *PNAS* 98 (22): 12527-12531.
- Tinajero, J.C., Fabbri, A., & Dufau, M.L. 1992. Regulation of corticotropin-releasing factor secretion from Leydig cells by serotonin. *Endocrinology* Apr;130(4):1780-8.
- Tjay, T. H. & Kirana, R. 2002. *Obat-obat Penting*. Edisi ke 5. PT Alex Media
- Tollner T.L., Vandevoort C.A, Yudin A.I., Treece C.A, Overstreet J.W., Cherr G.N..2009. Release of DEFB126 from macaque sperm and completion of capacitation are triggered by conditions that simulate periovulatory oviductal fluid. *Mol Reprod* 76:431-443.
- Tribuana N., 2006. *Pengukuran medan listrik dan medan magnet di bawah SUTET 500kV*. <http://www.elektroindonesia.com/elektro/ener32a.html>, 2000.
- Uhler M.L., Leung A., Chan S.Y., Wang C. 1992. Direct effects of progesterone and antiprogesterone on human sperm hyperactivated motility and acrosome reaction. *Fertil Steril* 58:1191-1198
- Umar, F.A. 2011. *Dasar-Dasar Penyakit Berbasis Lingkungan*. Gramedia.
- Wang, B. & Lai, H. 2000. Acute exposure to pulsed 2450-MHz microwave affect water-maze performance in rats. *Bioelectromagnetics* 21 : 52-56.
- Wdowiak A., Wdowiak L., & Wiktor H. 2007. Evaluation of the effect of using mobile phones on male fertility. *Ann Agric Environ Med* 14(1):169-172.
- Wennemuth G., D. F. Babcock, & B.Hille.2003. Calcium clearance mechanisms of mouse sperm, *The Journal of General Physiology*, 122 (1): 115–128.
- WHO. 1999. *Laboratory biosafety manual for the examination of human semen and sperm-cervical mucus interaction*, 4th ed. Geneva, World Health Organization.
- Williams, K.M. & Ford, W.C. 2001. The motility of demembrated human spermatozoa is inhibited by free calcium ion activities of 500 nmol/L or more. *Int J Androl* 24 : 216-224.
- Willingham, M.C. 1999. Cytochemical Methods for Detection of Apoptosis. *J.H.C.* 47 : 1101-1110
- Wlodkowic D., Skommer J., & Darzynkiewicz Z. 2012. Cytometry of apoptosis . Historical perspective and new advance. *Experimental Oncology* 34 : 255–262, (September)
- Wolf, F.I., Torsello, A., Tedesco, B., Fasanella, S., Boninsegna, A., D'Ascenzo, M., *et al.* 2005. 50-Hz extremely low frequency electromagnetic fields enhance cell proliferation and DNA damage: possible involvement of a redox mechanism. *Biochim Biophys Acta* Mar.22; 1743 (1-2);120-9. <http://www.nature.com/nrc/journal/v2/n6/images/nrc821-i1.gif>

- Xia J. and D. Ren. 2009. The BSA-induced Ca^{2+} influx during sperm capacitation is CATSPER channel-dependent. *Reproductive Biology and Endocrinology* 7: 119.
- Yan J.G., Agresti M., Bruce T., Yan Y.H., Granlund A., & Matloub H.S. 2007. Effects of cellular phone emissions on sperm motility in rats. *Fertil Steril* 88: 957-64.
- Yoshimura, S., Banno, Y., Nakashima, S., Takenaka, K., Sakai, H., Nishimura, Y., et.al. 1998. Ceramid Formation Leads to Caspase 3 Activation During Hypoxic PC12 Cell Death. Inhibitory Effect of Bcl-2 on Ceramid Formation and Caspase-3 Activation. *J Biol Chem* 273: 6921-6927.
- Zhou W., Wang X.B., Yang J.Q., Liu Y., & Zhang G.B. 2005. Influence of electromagnetic irradiation on P450scc mRNA expression in rat testis tissues and protective effect of the shield. *Zhonghua Nan Ke Xue* 11: 269-71.
- Zorn B., Ihan A., Kopitar A.N., Kolbezen M., Sesek B.A., & Meden V.H. 2010. Changes in sperm apoptotic markers as related to seminal leukocytes and elastase. *Reprod Biomed Online* 21:84-92.
- Zyrmec A., Jerman, I., & Lahajnar, G., 2002. Alternating electric fields stimulate ATP synthesis in *Escherichia Coli*. *Cell and Mol Biol Letters* 7 (1), 172-175.