

DAFTAR PUSTAKA

- Achmad, B. dan Firdausy, K. 2005. *Teknik Pengolahan Citra Digital Menggunakan Delphi*. Penerbit Andi: Yogyakarta.
- Amann, R. P. and Waberski, D. 2014. Computer-assisted Sperm Analysis (CASA): Capabilities and Potential Developments. *Theriogenology*. 81:5–17.
- Ando, Y. 2004. Development of Three-Dimensional Electrostatic Stages for Scanning Probe Microscope. *Sens. Act.* 114:285–291.
- Bahr, G. F. and Zeitler, E. 1964. Study of Bull Spermatozoa, *Cell. Biol.* 21(2):175–189.
- Banaszewska, D., Czubaszek, M., Walczak-Jędrzejowska, R. and Andraszek, K. 2015. Morphometric Dimensions of The Stallion Sperm Head Depending on The Staining Method Used. *Bull. Vet. Inst. Pulawy*. 59(2):263–270.
- Barth, A. D. and Oko, R. J. 1989. *Abnormal Morphology of Bovine Spermatozoa*. Iowa State University Press: Iowa.
- Bartoov, B., Berkovitz, A. and Eltes, F. 2001. Selection of Spermatozoa with Normal Nuclei to Improve The Pregnancy Rate with Intracytoplasmic Sperm Injection. *N. Engl. J. Med.* 345(14):1067-8.
- Baust, J. G., Gao, D. and Baust, J. M. 2009. Cryopreservation: An Emerging Paradigm Change. *Organogenesis*. 5(3):90-96.
- Beletti, M. E., Costa, L. F. and Guardieiro, M. M. 2005(a). Morphometric Features and Chromatin Condensation Abnormalities Evaluated by Toluidine Blue Staining in Bull Spermatozoa. *Braz. J. Morphol. Sci.* 22(2):85-90.
- Beletti, M. E., Costa, L. D. and Viana, M. P. 2005(b). A Comparison of Morphometric Characteristics of Sperm from Fertile Bos Taurus and Bos Indicus Bulls in Brazil. *Anim. Reprod. Sci.* 85:105–116.
- Berkovitz, A., Eltes, F., Ellenbogen, A., Peer, S., Feldberg, D. and Bartoov, B. 2006. Does the Presence of Nuclear Vacuoles in Human Sperm Selected for ICSI Affect Pregnancy Outcome?. *Hum. Reprod.* 21(7):1787-90.
- Bhakti, T. L., Susanto, A., Santosa, P. I. and Widayati, D. T. 2012. Design of Bovine Semen Temperature Controller Using PID. *Int'l. J. of Comp. Eng. Res.* 2(7):52-58.
- Bishop, D. W. 1962. Sperm Motility. *Physiol. Rev.* 42:1-59.

- Boediono, A. 2001. Sperm Immobilization Prior to Intracytoplasmic Sperm Injection (ICSI) and Oocyte Activation Improve Early Development of Microfertilized Goat Oocytes. *Reprotech*. 1:29-34.
- Boersma, A. A., Braun, J. and Stolla, R. 1999. Influence of Random Factors and Two Different Staining Procedures on Computer-assisted Sperm Head Morphometry in Bulls. *Reprod. Dom. Anim.* 34(2):77-82.
- Boersma, A., Rasshofer, R. and Stolla, R. 2001. Influence of Sample Preparation, Staining Procedure and Analysis Conditions on Bull Sperm Head Morphometry using The Morphology Analyser Integrated Visual Optical System. *Reprod. Dom. Anim.* 36:222–229.
- Boryshpolets, S., Kowalski, R. K., Dietrich, G. J., Dzyuba, B. and Ciereszko, A. 2013. Different Computer-Assisted Sperm Analysis (CASA) Systems Highly Influence Sperm Motility Parameters. *Theriogenology*. 80(7):758–765.
- Bretherton, F. P. and Rothschild. 1961. Rheotaxis of Spermatozoa. *Proc. R. Soc. Lond. B*. 153(953):490-502.
- Brito, L. F. C. 2007. Evaluation of Stallion Sperm Morphology. *Clin. Tech. Equi. Pract.* 6:249-264.
- Buchner, O., Lütz, C. and Holzinger, A. 2007. Design and Construction of A New Temperature-Controlled Chamber for Light and Confocal Microscopy Under Monitored Conditions: Biological Application for Plant Samples, *J. Microsc.* 225(2):183-91.
- Burness, G., Moyes, C. D. and Montgomerie, R. 2005. Motility, ATP Levels and Metabolic Enzyme Activity of Sperm from Bluegill (*Lepomis macrochirus*). *Comp. Biochem. Physiol. A Mol. Integr. Physiol.* 140(1):11-7.
- Butts, I. A. E., Ward, M. A. R., Litvak, M. K., Pitcher, T. E., Alavi, S. M. H., Trippel., E. A. and Rideout, R. M. 2011. Automated Sperm Head Morphology Analyzer for Open-Source Software. *Theriogenology*. 76:1756–1761.
- Campbell, R. A. A., Eifert, R. W. and Turner, G. C. 2014. Openstage: A Low-Cost Motorized Microscope Stage with Sub-Micron Positioning Accuracy. *PLoS ONE*. 9(2):1-18.
- Chen, C., Li, L., Dong, C., Yu, H. and Wang, Y. 2010. Semiconductor Laser High-precision Temperature Control System Basing on Digital Signal Processing, *Int'l. Conf. Elect. Cont. Eng.* 1:1880-1883.

- Chongwei, B., Chuchun, Y. and Bao, D. 2010. Design and Experiment of A High-Precision Temperature Control System. *Int'l. Conf. Meas. Tech. Mech. Auto.* 1:928-930.
- Cochran, R., Meintjes, M., Roggio, B. and Hylan, D. 1998. Live Foals Produced From Sperm Injected Oocytes Derived From Pregnant Mares. *Equine. Vet. Sci.* 18:736-740.
- Coetzee, K., Kruge, T. F. and Lombard, C. J. 1998. Predictive Value of Normal Sperm Morphology: A Structured Literature Review. *Hum. Reprod. Upd.* 4(1):73-82.
- Cong, M., Xu, W. and Wang, Y. 2010. Design of Temperature Controller for Laser Diode Based on DSP and Fuzzy-PID Control. *Int'l. Conf. Elec. Con. Eng.* 1:786-789.
- Cooper, T. G., Noonan, E., Von Eckardstein, S., Auger, J., Baker, H. W. G., Behre, H. M., Haugen, T. B., Kruger, T., Wang, C., Mbizvo, M. T. and Vogelsong, K. M. 2010. World Health Organization Reference Values for Human Semen Characteristics. *Hum. Reprod. Upd.* 16(3):231–245.
- Craft, I., Tsirigotis, M., Bennet, V., Taranissi, M., Khalifa, Y., Hogewind, G. and Nicholson, N. 1995. Percutaneous Epididymal Sperm Aspiration and Intracytoplasmic Sperm Injection in The Management of Infertility Due to Obstructive Azoospermia. *Fertil. Steril.* 63:1038-1042.
- Darin, B., Goropevnek, A., Hojnik, N. and Vlasisavljevit, V. 2009. Sperm Morphological Abnormalities as Indicators of DNA Fragmentation and Fertilization in ICSI. *Arch. Gynecol. Obstet.* 281:363–367.
- De Paz, P., Mata-Campuzano, M., Tizado, E. J., Álvarez, M., Álvarez-Rodríguez, M., Herraiez, P. and Anel, L. 2011. The Relationship Between Ram Sperm Head Morphometry and Fertility Depends on The Procedures of Acquisition and Analysis Used. *Theriogenology.* 76(7):1313-1325.
- De Voz, A. 2000. Intracytoplasmic Sperm Injection (ICSI). *Hum. Reprod.* 15(4):59-64.
- De Vos, A., Van De Velde, H., Joris, H., Verheyen, G., Devroey, P. and Van Steirteghem, A. 2003. Influence of Individual Sperm Morphology on Fertilisation, Embryo Morphology, and Pregnancy Outcome of Intracytoplasmic Sperm Injection. *Fertil. Steril.* 79:42–48.

- Dozortzev, D., Rybouchkin, A., Sutter, P., Qian, C. and Dhont, M. 1995. Human Oocyte Activation Following Intracytoplasmic Sperm Injection: The Role of Sperm Cell. *Hum. Reprod.* 10:403-407.
- Drebushchak, V. A. 2008. The Peltier Effect. *J. Therm. Anal. Cal.* 91(1):311–315.
- Du Bois, S. 2011. *Effects of Cooling Time and Thaw Rate on Membrane Integrity and Motility of Frozen-Thawed Canine Spermatozoa Using Commercial Semen Extenders*. Louisiana State University Press: Louisiana.
- Edwards, R. G., Steptoe, P. C. and Purdy, J. M. 1980. Establishing Full-Term Human Pregnancies Using Cleaving Embryos Grown In Vitro. *Obstet. Gynaecol.* 87:737-756.
- Elsayed, M., El-Sherry, T.M. and Abdelgawad, M. 2015. Development of Computer-Assisted Sperm Analysis Plugin for Analyzing Sperm Motion in Microfluidic Environments using ImageJ. *Theriogenology*. 84(8):1367-1377.
- Eriksson, F. 1998. Stepper Motor Basics. <http://www.solarbotics.net/library/pdflib/pdf/motorbas.pdf>. Diakses 21 Juli 2016.
- Esfandiari, N., Saleh, R. A., Blaut, A. P., Sharma, R. K., Nelson, D. R., Thomas, A. J., Falcone, T. and Agarwal, A. 2002. Effect of Temperature on Sperm Motion Characteristics and Reactive Oxygen–Species. *Int'l. J. Fertil.* 47(5):227-233.
- Fauque, P., L'éandri, R., Merlet, F., Juillard, J. C., Epelboin, S., Guibert, J., Jouannet, P. and Patrat, C. 2007. Pregnancy Outcome and Live Birth After IVF and ICSI According to Embryo Quality. *Assist. Reprod. Gen.* 24:159–165.
- Franken, D. R., Smith, M. and Menkveld, R. 2000. The Development of A Continuous Quality Control Programme for Strict Sperm Morphology Among Sub-Saharan African Laboratories. *Hum. Reprod.* 15:667–671.
- Garner, D. L. and Hafez, E. S. E. 2000. Spermatozoa and Seminal Plasma. *In: Reproduction in Farm Animals (7th Ed.)*. Hafez, B. and Hafez, E. S. E. (Ed.). Lippincott William & Wilkins : Baltimore.
- Geusebroek, J., Cornelissen, F., Smeulders, A. W. M. and Geerts, H. 2000. Robust Autofocusing in Microscopy. *Cytometry*. 39:1–9.
- Gomez, M. C., Catt, J. W., Evans, G. and Maxwell, W. M. C. 1998. Cleavage, Development and Competence of Sheep Embryos Fertilized by

- Intracytoplasmic Sperm Injection and In Vitro Fertilization. *Theriogenology*. 49:1143-1154.
- Gorniak, J. M. 2010. *Design and Metrology of a Precision XY Planar Stage*. University of Waterloo Press: Ontario.
- Gravance, C. G., Lewis, K. M. and Casey, P.J. 1995. Computer Automated Sperm Head Morphometry Analysis (ASMA) of Goat Spermatozoa. *Theriogenology*. 44:989-1002.
- Gravance, C., Liu, I., Davis, R., Hughes, J. and Casey, P. 1996. Quantification of Normal Head Morphometry of Stallion Spermatozoa. *Reprod. Fertil*. 108:41–46.
- Gravance, C. G., Garner, D. L., Pitt, C., Vishwanath, R., Sax-Gravance, S. K. and Casey, P. J. 1999. Replicate and Technician Variation Associated with Computer Aided Bull Sperm Head Morphometry Analysis (ASMA). *Int'l. J. Androl*. 22(2):77-82.
- Graves, J. E., Higdon III, H. L., Boone, W. R. and Blackhurst, D. W. 2005. Developing Techniques for Determining Sperm Morphology in Today's Andrology Laboratory. *Ass. Reprod. Gen*. 22(5):219-225.
- Guarino, V., Guaccio, A., Netti, P. A. and Ambrosio, L. 2010. Image Processing and Fractal Box Counting: User-Assisted Method for Multi-Scale Porous Scaffold Characterization. *J. Mater. Sci*. 21:3109–3118.
- Gunawan, M., Fahrudin, M. dan Boediono, A. 2014. Perkembangan Embrio Sapi Setelah Fertilisasi Menggunakan Metode Intracytoplasmic Sperm Injection (ICSI) dan Aktivasi dengan Strontium. *J. Ked. Hew*. 8(2):154-157.
- Hamano, K., Li, X., Qian, X. Q., Funauchi, F., Furudate, M. and Minato, Y. 1999. Gender Preselection in Cattle with Intracytoplasmically Injected, Flow Cytometrically Sorted Sperm Heads. *Biol. Reprod*. 60:1194-1197.
- Henkel, R., Maaß, G., Bodeker, R. H., Scheibelhut, C., Stalf, T., Mehnert, C., Schuppe, H. C., Jung, A. and Schill, W. B. 2005. Sperm Function and Assisted Reproduction Technology. *Reprod. Med. Biol*. 4(1):7-30.
- Hewitson, L. C., Dominiko, T., Takahashi, D., Martinovich, C., Ramalho-Santos, J., Sutovsky, P., Fanton, J., Jacob, D., Monteith, D., Neuringer, M., Battaglia, D., Simerly, C. and Schatten, G. 1999. Unique Checkpoints During The First Cycle of Fertilization After Intracytoplasmic Sperm Injection in Rhesus Monkey. *Nature*. 5:431-433.

- Hidalgo, M. and Dorado, J. 2009. Objective Assessment of Goat Sperm Head Size by Computer-Assisted Sperm Morphometry Analysis (ASMA). *Small Rum. Res.* 87:108–110.
- Hiramoto, Y. 1966. Microinjection of The Live Spermatozoa Into Sea Urchin Eggs. *Exp. Cell. Res.* 27:416-426.
- Holzinger, A. 2007. Temperature Controlled Microscopy. *Mod. Res. Edu. Top. Micros.* 1:951-955.
- Hosoi, Y., Miyake, M., Utsumi, K. and Iritani, A. 1988. Development of Rabbit Oocytes After Microinjection of Spermatozoa (Proc.). *11th Int'l. Conf. Anim. Reprod. Art. Ins.* 1:331-335.
- Iritani, A. 1989. *Micromanipulation of Oocytes and Embryos*. Parthenon Press: Karnforth.
- Javed, M. and Michael, E. 2012. Intracytoplasmic Sperm Injection – Factors Affecting Fertilization. *In: Enhancing Success of Assisted Reproduction (pp. 117-144)*, Darwish, A. M. M. (Eds.). InTech: published online at <http://www.intechopen.com/books/enhancing-success-of-assisted-reproduction/intracytoplasmic-sperm-injection-factors-affecting-fertilization>.
- Kaiin, E., M., Gunawan, M. dan Yanthi, N. D. 2008. *Pengembangan Teknologi Mikro Fertilisasi (ICSI) dan Kultur Sel Hewan untuk Peningkatan Produktivitas*. Penerbit Pusat Penelitian Bioteknologi LIPI: Cibinong.
- Kalbassi, M. R., Lorestani, R. and Maramazi, G. J. 2013. Analysis of Saline Activator Solution Effects on Sperm Quality Indices of Barbus Sharpeyi by ImageJ Software. *Iran. J. Fish. Sci.* 12(2):357-377.
- Karpuz, V., Gokturk, A. and Koyuturk, M. 2007. The Effects of Sperm Morphology and Motility on The Outcome of Intracytoplasmic Sperm Injection. *Marmara Med.* 20(2):92-97.
- Kato, Y. and Nagao, Y. 2012. Effect of Polyvinylpyrrolidone on Sperm Function and Early Embryonic Development Following Intracytoplasmic Sperm Injection in Human Assisted Reproduction. *Reprod. Med. Biol.* 11:165–176.
- Kenjo, T. 1984. Stepping Motor and Their Microprocessor Controls. *Monographs in Electrical and Electronic Engineering*. Oxford University Press: New York.
- Kim, D. E. and Tveiten, H. 2002. Unusual Motility Characteristics of Sperm The Spotted Wolffish. *Fish Biol.* 61:1549-1559.

- Kimura, Y. and Yanagimachi, R. 1995. Intracytoplasmic Sperm Injection in The Mouse. *Biol. Reprod.* 52:709-720.
- Komori, K., Tsujimura, A., Ishijima, S., Tanjapatkul, P., Fujita, K., Matsuoka, Y., Takao, T., Miyagawa, Y., Takada, S. and Okuyama, A. 2006. Comparative Study of Sperm Motility Analysis System and Conventional Microscopic Semen Analysis. *Reprod. Med. Biol.* 5:195–200.
- Kondracki, S., Banazewska, D., Wysokińska, A. and Chomicz, J. 2006. Sperm Morphology of Cattle and Domestic Pigs. *Soc. Biol. Reprod.* 6(2):99-104.
- Kuretake, S., Kimura, Y., Hoshi, K. and Yanagimachi, R. 1996. Fertilization and Development of Mouse Oocytes Injected with Isolated Sperm Heads. *Biol. Reprod.* 55:789-795.
- Kwon, H. N., Lee, J., Takahashi, K. and Toshiyoshi, H. 2006. MicroXY Stages with Spider-Leg Actuators for Two-Dimensional Optical Scanning. *Sens. Act.* 130–131:468–477.
- Larsen, L., Scheike, T., Jensen, T. K., Bonde, J. P., Ernst, E., Hjollund, N. H., Zhou, Y., Skakkebaek, N. E. and Giwercman, A. 2000. Computer-Assisted Semen Analysis Parameters as Predictors for Fertility of Men From The General Population. *Hum. Reprod.* 15 (7):1562-1567.
- Ledezma-Torres, R. A., Sandoval, L., Valladares, P., Mellado, M., Picón, F. J., Ramírez, R. and Sánchez, F. 2014. Effect of Cooling on Sperm Motility Before and After Frozen-Thawed Stallion Semen. *African J. Biotech.* 13(12):1439-1443.
- Leuchtenberger, C., Murmanis, I., Murmanis, L., Ito, S. and Wier, D. R. 1956. Interferometric Dry Mass and Microspectrophotometric Arginine Determinations on Bull Sperm Nuclei with Normal and Abnormal DNA Content. *Chromosoma.* 8(1):73-86.
- Lin, K. C. 2010. Microscopic Autofocusing Using Regional Monotonous Variations of Multiple Focal Value Measures. *Elect. Imag.* 19(2):1-8.
- Liu, J., Leung, C., Lu, Z. and Sun, Y. 2013. Human Sperm Tracking, Analysis and Manipulation. In: *Smart Materials-Based Actuators at The Micro/Nano-Scale: Characterization, Control and Applications* (pp. 251-264). Rakotondrabe, M. (Ed.). Springer Science + Business Media: New York.
- Ma, X., An, G. and Li, B. 2009. Design and Implementation of An Automated Microscope Stage. *Int. Forum Info. Tech. App. (IFITA 2009)*. 1(1):603-605.

- Makler, A., Deutch, M., Vilensky, A. and Palti, Y. 1981. Factors Affecting Sperm Motility. VIII. Velocity and Survival of Human Spermatozoa as Related to Temperatures Above Zero. *Int. J. Androl.* 4(5):559-569.
- Martin, M. J. 2000. Development of In Vivo Matured Porcine Oocytes Following Intracytoplasmic Sperm Injection. *Biol. Reprod.* 63:109-112.
- Maruyama, S., Komiya, A., Takeda, H. and Aiba, S. 2008. Development of Precise-Temperature-Controlled Cooling Apparatus for Medical Application by Using Peltier Effect. *Int'l. Conf. Biomed. Eng. Inf.* 2:610-614.
- Meilan, P. F. and Garavaglia, M. 1997. Rayleigh Resolution Criterion for Light Sources of Diferent Spectral Composition. *Braz. J. Phy.* 27(4):638-643.
- Mohamed, J., Ismail, M. N., Chou, T. Y., Louis, S. R. and Budin, S. B. 2012. A Study of Sperm Quality Characteristics Changes in Different Storage Temperatures above Freezing Point. *Int'l. J. Col. Res. Intern. Med. Pub. Heal.* 4(5):736-743.
- MS-MOTOR. 2015. Datasheet Hybrid Linear Actuator 11E2045A4-095-001. <http://www.ms-motor.com/product-1-3-en.html>. Diakses 21 Juli 2016.
- Nilani, K., Eswaramohan, T. and Balasubramaniam, K. 2012. Influence of Temperature on Motility and Viability of Bovine Spermatozoa During Cold Storage. *Int'l. J. Sci. Res. Pub.* 2(12):1-5.
- Okada, H., Fujioka, H., Tatsumi, N. and Fujisawa, M. 1999. Assisted Reproduction for Infertile Patients with Immotile Spermatozoa Associated with Autosomal Dominant Polycystic Kidney Disease. *Hum. Reprod.* 14:110-113.
- Ostermeier, G. C., Sargeant, G. A., Yandell, B. S., Evenson, D. P. and Parrish J. J. 2001. Relationship of Bull Fertility to Sperm Nuclear Shape. *J. Androl.* 22(4):595-603.
- Palermo, G. D., Joris, H., Devroey, P. and Van Steirteghem, A. C. 1992. Pregnancies After Intracytoplasmic Sperm Injection of Single Spermatozoon Into An Oocyte. *Lancet.* 340:17-18.
- Park, K. S., Yi, W. J. and Paick, J. S. 1997. Segmentation of Sperms using The Strategic Hough Transform. *Ann. Biomed. Eng.* 25:294-302.
- Pathak, A. and Goel, V. 2013. Heat Pump Design using Peltier Element for Temperature Control of The Flow Cell. *Int'l. J. Comp. Sci. Eng. App. (IJCSEA).* 3(3):41-47.

- Pope, C. E., Johnson, C. A., McRae, M. A., Keller, G. L. and Dresser, B. L. 1998. Development of Embryos Produced by Intracytoplasmic Sperm Injection of Domestic Cat Oocytes. *Anim. Reprod. Sci.* 53:221-236.
- Roy, B. 2014. A Comparative Study on Sperm Morphometry of Crossbred and Murrah Buffalo Bulls. *Int'l. J. Agric. Sci. Vet. Med.* 2(3):149-155.
- Sadeghian, F., Seman, Z., Ramli, A. R., Kahar, B. H. A. and Saripan, M. I. 2009. A Framework for White Blood Cell Segmentation in Microscopic Blood Images Using Digital Image Processing, *Bio. Proc. Onl.* 11(1):196-206.
- Said, S., Saili, T. dan Tappa, B. 2003. Pengaktifan dan Pembuahan Sel Telur Tikus Setelah Disuntik dengan Kepala Spermatozoa. *Hayati.* 10:96-99.
- Said, S., Tappa, B., Kaiin, E. M., Rahmani, N., Afiati, F., Yulnawati, Astuti, W. D., Gunawan, M. dan Yanthi, N. D. 2006. *Pengembangan Teknologi Reproduksi Bibit Unggul dan Preservasi serta Modifikasi Genom Ternak*, Penerbit Pusat Penelitian Bioteknologi LIPI: Cibinong.
- Sailer, B. L., Jost, L. K. and Evenson, D. P. 1996. Bull Sperm Head Morphometry Related to Abnormal Chromatin Structure and Fertility. *Cytometry.* 24(2):167-73.
- Saili, T., Said, S., Setiadi, M. A., Agungpriyono, S., Toelihere, M. R. dan Budiono, A. 2005. Intracytoplasmic Sperm Injection (ICSI) Sebagai Teknik Reproduksi Bantuan Unggulan. *Sain. Vet.* 1:53-59.
- Sánchez, L., González, V., Alegre, E. and Alaiz, R. 2008. Classification and Quantification Based on Image Analysis for Sperm Samples with Uncertain Damaged / Intact Cell Proportions. *Int'l. Conf. Image Anal. Recog. (ICIAR 2008).* 2:827–836.
- Santos, A., De Solo´rzano, O., Vaquero, J.J., Peña, J.M., Malpica, N. and Del Pozo, F. 1997. Evaluation of Autofocus Functions in Molecular Cytogenetic Analysis. *Microscopy.* 188(3):264–272.
- Shi, L. Z., Nascimento, J. M., Chandsawangbhuwana, C., Berns, M. W. and Botvinick, E. L. 2006. Real-time Automated Tracking and Trapping System (RATTS) for Sperm. *Microsc. Res. Tech.* 69(11):894-902.
- Shi, L. Z., Nascimento, J. M., Chandsawangbhuwana, C., Botvinick, E. L. and Berns, M. W. 2008. An Automatic System to Study Sperm Motility and Energetics. *Biomed. Micro.* 10(1):573-583.

- Silber, S. J., Nagy, Z. P. and Iu, J. 1994. Conventional In Vitro Fertilization Versus Intracytoplasmic Sperm Injection for Patients Requiring Microsurgical Sperm Aspiration. *Hum. Reprod.* 9:1705-1709.
- Singhal, R., Padhee, S. and Kaur, G. 2012. Design of Fractional Order PID Controller for Speed Control of DC Motor. *Int'l. J. Sci. Res.* 2(6):1-8.
- Sukhato, P., Thongsodseang, S., Utha, A. and Songsasen, N. 2001. Effects of Cooling and Warming Conditions on Post-Thawed Motility and Fertility of Cryopreserved Buffalo Spermatozoa. *Anim. Reprod. Sci.* 67(1-2):69-77.
- Sun, Y., Duthaler, S. and Nelson, B.J. 2004. Autofocusing in Computer Microscopy: Selecting the Optimal Focus Algorithm. *Micros. Res. Tech.* 65:139-149.
- Sundaraman, M. N., Kalatharan, J. and Jawahar, K. T. P. 2007. Analyses of Morphological and Morphometrical Deviations of Bull Spermatozoa by Computer Assisted Semen Analysis Technique. *Asian J. Anim. Vet. Adv.* 2(4):196-204.
- Taniguchi, K., Watanabe, S. and Nakano, Y. 2000. A High Precision Method of The Microscope Auto-Focusing for The Quality Inspection. *T. IEEE Japan.* 120(C):1283-1284.
- Tano, M., Gao, W., Kiyono, S., Tomita, Y., Makino, K. and Morita, H. 2005. Precision Positioning of a Sawyer Motor-Driven Stage by A Surface Encoder. *Inst. Phy. Pub.* 13:90-93.
- Trippel, E. A. 2003. Estimation of Male Reproductive Success of Marine Fishes. *North. Atl. Fish. Sci.* 33:81-113.
- Vanderzwalmen, P., Bach, M., Baramsai, B., Neyer, A., Schwerda, D., Stecher, A., Wirleitner, B., Zintz, M., Lejeune, B., Vanderzwalmen, S., Cassuto, G. N., Zech, M. and Zech, N. H. 2012. Intracytoplasmic Morphologically Selected Sperm Injection. In: *Practical Manual of In Vitro Fertilization: Advanced Methods and Novel Devices* (pp. 229-240). Nagy, Z. P. et al. (Eds.). Springer Science + Business Media: New York.
- Vandewoestyne, M., Hoofstat, D. V., Nieuwerburgh, F. V. and Deforce, D. 2009. Automatic Detection of Spermatozoa for Laser Capture Microdissection. *Int'l. J. Leg. Med.* 123:169-175.
- Van Duijn, C. 1960. Mensuration of The Heads of Bull Spermatozoa. *Mikroskopie.* 14:265-76.

- Van Duijn, C. and Van Voorst, C. 1971. Precision Measurements of Dimensions, Refractive Index and Mass of Bull Spermatozoa in The Living State. *Mikroskopie*. 27:142-167.
- Van Steirteghem, A. C., Nagy, Z. P., Joris, H., Liu, J., Staessen, C., Smitz, J., Wisanto, A. and Devroey, P. 1993. High Fertilization and Implantation Rates After Intracytoplasmic Sperm Injection. *Hum. Reprod.* 8:1061-1066.
- Vaquero, D., Gelfand, N., Tico, M., Pulli, K. and Turk, M. 2011. Generalized Autofocus. *IEEE Work. App. Comp. Vis. (WACV)*. 1:511-518.
- Varisli, O., Uguz, C., Agca, C. and Agca, Y. 2009. Motility and Acrosomal Integrity Comparisons Between Electro-Ejaculated and Epididymal Ram Sperm After Exposure to A Range of Anisotonic Solutions, Cryoprotective Agents and Low Temperatures. *Anim. Reprod. Sci.* 110:256–268.
- Vested, A., Ramlau-Hansen, C. H., Bonde, J. P., Thulstrup, A. M., Kristensen, S. L. and Toft, G. 2011. A Comparison of Conventional and Computer-Assisted Semen Analysis (CRISMAS Software) using Samples from 166 Young Danish Men. *Asian J. Androl.* 13(3):453-8.
- Vicente-Fiel, S., Palacin, I., Santolaria, P., Hidalgo, C. O., Silvestre, M. A., Arrebola, F. dan Yaniz, J. L. 2013. A Comparative Study of The Sperm Nuclear Morphometry in Cattle, Goat, Sheep and Pigs using A New Computer-Assisted Method (CASMA-F). *Theriogenology*. 79(3):436-42.
- Walters, A. H., Eyestone, W. E., Saacke, R. G., Pearson, R. E. and Gwazdauskas, F. C. 2004. Sperm Morphology and Preparation Method Affect Bovine Embryonic Development. *J. Androl.* 25(4):554-563.
- Wang, J. 2008. Temperature Control for the Thermal Cycling of Polymerase Chain Reaction. *IEEE/ACIS. Int'l. Conf. Comp. Inf. Sci.* 7:88-92.
- Wang, Y., Jia, Y., Yuchi, M. and Ding, M. 2011. The Computer-Assisted Sperm Analysis (CASA) Technique for Sperm Morphology Evaluation. *Int'l. Conf. Int. Comp. Biomed. Instr.* 1: 279-282.
- Wilson-Leedy, J. G. and Ingermann, R. L. 2007. Development of A Novel CASA System Based on Open Source Software for Characterization of Zebrafish Sperm Motility Parameters. *Theriogenology*. 67:661–672.
- World Health Organization. 1999. *WHO Laboratory Manual for The Examination of Human Semen and Sperm-Cervical Mucus Interaction* (4th Ed.). Cambridge University Press: New York.

- World Health Organization. 2010. *WHO Laboratory Manual for The Examination and Processing of Human Semen (5th Ed.)*. WHO Press: Geneva.
- Yanagida, K. 2009. Recent Progress in In Vitro Fertilization and Intracytoplasmic Sperm Injection Technologies in Japan. *Jap. Med. Assoc.* 137(1):31-34.
- Yanagimachi, R. 2001. Gamete Manipulation for Development: New Methods for Conception. *Reprod. Fertil. Dev.* 13:3-14.
- Yaniz, J. L., Vicente-Fiel, S., Capistros, S., Palacin, I. and Santolaria, P. 2012. Automatic Evaluation of Ram Sperm Morphometry. *Theriogenology*. 77:1343–1350.
- Yaniz, J. L., Soler, C. and Santolaria, P. 2015. Computer Assisted Sperm Morphometry in Mammals: A Review. *Anim. Reprod. Sci.* 156:1–12.
- Yedamale, P. and Chattopadhyay, S. 2002. Stepper Motor Microstepping with PIC18C452. *Artikel Publikasi DS00822A tersedia di laman:* <http://ww1.microchip.com/downloads/en/AppNotes/00822a.pdf>. Diakses 21 Juli 2016.
- Zhang, J. X. and Xu, K. 2009. Intracytoplasmic Sperm Injection and Other Micromanipulation Techniques for Assisted Reproduction. *Glob. Libr. Women's Med.* Published online at https://www.glowm.com/section_view/item/368/recordset/71685/value/368.