

DAFTAR PUSTAKA

- Abuetaf, Y., Wu, H. H., Chai, C., Al Yousef, H., Persad, S., Sergi, C. M., & Leng, R. (2022). DNA damage response revisited: the p53 family and its regulators provide endless cancer therapy opportunities. *Experimental and Molecular Medicine*, 54(10), 1658–1669. <https://doi.org/10.1038/s12276-022-00863-4>
- Alatas, Z. (2006). Efek Pewarisan Akibat Radiasi Pengion. *Buletin Alara*, 8(2), 65–74.
- Badan Pengawas Tenaga Nuklir. (2013a). *Keselamatan Radiasi Dalam Penyimpanan Technologically Enhanced Naturally Occurring Radioactive Material*.
- Badan Pengawas Tenaga Nuklir. (2013b). Proteksi dan Keselamatan Radiasi dalam Pemanfaatan Tenaga Nuklir. In *Peraturan Kepala Badan Pengawas Tenaga Nuklir Nomor 4 Tahun 2013*.
- Badan Pusat Statistik. (2022). Kabupaten Mamuju dalam Angka. In *BPS Kabupaten Mamuju*.
- Belgovskaya, A. A. P., Gindilis, V. M., Grinberg, K. N., Bogomasov, E. A., Podugolnikova, O. A., Isaeva, I. I., Radjabli, S. I., Cellarius, S. P., & Veschnova, I. V. (1968). Association of Acrocentric Chromosome in Relation to Cell Type and Age of Individuals. *Experimental Cell Research*, 49, 612–625. [https://doi.org/https://doi.org/10.1016/0014-4827\(68\)90208-5](https://doi.org/https://doi.org/10.1016/0014-4827(68)90208-5)
- Blumenreich, M. S. (1990). *Clinical Methods: The History, Physical, and Laboratory Examinations*. 3rd edition. (Issue 153). [https://doi.org/10.1016/s0733-8627\(20\)30981-0](https://doi.org/10.1016/s0733-8627(20)30981-0)
- Bonner, W. M. (2003). Low-dose radiation: Thresholds, bystander effects, and adaptive responses. *Proceedings of the National Academy of Sciences of the United States of America*, 100(9), 4973–4975. <https://doi.org/10.1073/pnas.1031538100>
- Caradonna, F. (2015). Nucleoplasmic bridges and acrocentric chromosome associations as early markers of exposure to low levels of ionising radiation in occupationally exposed hospital workers. *Mutagenesis*, 30(2), 269–275. <https://doi.org/10.1093/mutage/geu068>
- Chandran Geetha, A., & Sreedharan, H. (2016). International Journal of Advanced Research in Biological Sciences Review on studies in high background radiation areas (HBRAs) of various parts of the world. *International Journal of Advanced Research in Biological Sciences*, 3(8), 163–169.
- Chowdhury, M. R., Singh, A., & Dubey, S. (2020). Role of cytogenetics and molecular genetics in human health and medicine. In *Animal Biotechnology: Models in Discovery and Translation*. INC. <https://doi.org/10.1016/B978-0-12-811710-1.00022-7>

- Cohen, M. M., & Shaw, M. W. (1967). The association of acrocentric chromosomes in 1000 normal human male metaphase cells. *Annals of Human Genetics*, 31(2), 129–140. <https://doi.org/10.1111/j.1469-1809.1967.tb00544.x>
- Edwin W, T. (1965). The Mechanism of Colchicine Inhibition of Mitosis. *The Journal of Cell Biology*, 25, 145–160.
- Elgazzar, A. H., & Kazem, N. (2015). Biological Effects of Ionizing Radiation. In *The Pathophysiologic Basis of Nuclear Medicine* (pp. 715–725). <https://doi.org/10.1007/978-3-319-06112-2>
- Erdmann, F., Ghantous, A., & Schuz, J. (2018). Environmental Agents and Childhood Cancer. In *Encyclopedia of Environmental Health, 2nd Edition* (2nd ed., pp. 1–13). Elsevier Inc. <https://doi.org/10.1016/B978-0-12-409548-9.11725-7>
- Erwinsyah, R., Riandi, & Nurjhani, M. (2017). Relevance of Human Chromosome Analysis Activities against Mutation Concept in Genetics Course. *IOP Conf. Series: Materials Science and Engineering*, 180(1), 1–8. <https://doi.org/10.1088/1742-6596/755/1/011001>
- Estandarte, A. K. C. (2012). *Staining Strategies for Imaging of Metaphase Chromosomes*. University College London.
- Fan, X.-J., Yu, H., & Ren, J. (2011). Homeostasis and Compensatory Homeostasis: Bridging Western Medicine and Traditional Chinese Medicine. *Current Cardiology Reviews*, 7(1), 43–46. <https://doi.org/10.2174/157340311795677671>
- Fisher, D. R., & Fahey, F. H. (2017). Appropriate use of effective dose in radiation protection and risk assessment. *Health Physics*, 113(2), 102–109. <https://doi.org/10.1097/HP.0000000000000674>
- González, J. E., Radl, A., Romero, I., Barquinero, J. F., García, O., & Di Giorgio, M. (2016). Automatic detection of mitosis and nuclei from cytogenetic images by cellprofiler software for mitotic index estimation. *Radiation Protection Dosimetry*, 172(1–3), 218–222. <https://doi.org/10.1093/rpd/ncw180>
- Goodpasture, C., Bloom, S. E., Hsu, T. C., & Arrighi, F. E. (1976). Human nucleolus organizers: The satellites or the stalks? *American Journal of Human Genetics*, 28(6), 559–566.
- Ha, S. Y., Choi, M., Lee, T., & Park, C. K. (2016). The prognostic role of mitotic index in hepatocellular carcinoma patients after curative hepatectomy. *Cancer Research and Treatment*, 48(1), 180–189. <https://doi.org/10.4143/crt.2014.321>
- Hansson, A. (1975). Compensatory mechanisms in the satellite association patterns of individuals with Robertsonian translocations. *Hereditas*, 81, 101–112. <https://doi.org/10.1111/j.1601-5223.1975.tb01022.x>
- Hansson, A. (1979). Satellite association in human metaphases. A comparative study of normal individuals, patients with Down syndrome and their parents.

Hereditas, 90, 59–83. <https://doi.org/10.1111/j.1601-5223.1979.tb01294.x>

- International Atomic Energy Agency. (2011). Cytogenetic Dosimetry: Applications in Preparedness for and Response to Radiation Emergencies. In *International Atomic Energy Agency Vienna International Centre*.
- Jacobs, P. A., Mayer, M., & Morton, N. E. (1976). Acrocentric Chromosome Associations in Man. *American Journal of Human Genetics*, 28(6), 567–576.
- Jimson, S., Malathi, L., Kailash Kumar, G. M., & Balachander, N. (2016). Artifact in histological section. *Biomedical and Pharmacology Journal*, 9(2), 843–845. <https://doi.org/10.13005/bpj/1014>
- Kam, W. W. Y., & Banati, R. B. (2013). Effects of ionizing radiation on mitochondria. *Free Radical Biology and Medicine*, 65, 607–619. <https://doi.org/10.1016/j.freeradbiomed.2013.07.024>
- Kanev, I., Mei, W. N., Mizuno, A., Dehaai, K., Sanmann, J., Hess, M., Starr, L., Grove, J., Dave, B., & Sanger, W. (2013). Searching for electrical properties, phenomena and mechanisms in the construction and function of chromosomes. *Computational and Structural Biotechnology Journal*, 6(7), e201303007. <https://doi.org/10.5936/csbj.201303007>
- Khan, M. G. M., & Wang, Y. (2022). Advances in the Current Understanding of How Low-Dose Radiation Affects the Cell Cycle. *Cells*, 11(356), 1–14. <https://doi.org/10.3390/cells11030356>
- Kim, Y. J., Lee, J. W., Cho, Y. H., Choi, Y. J., Lee, Y., & Chung, H. W. (2022). Chromosome Damage in Relation to Recent Radiation Exposure and Radiation Quality in Nuclear Power Plant Workers. *Toxics*, 10(94), 1–11. <https://doi.org/10.3390/toxics10020094>
- Kosti, O., Byrne, C., Cocilovo, C., Willey, S. C., & Zheng, Y. L. (2010). Phytohemagglutinin-Induced Mitotic Index in Blood Lymphocytes: A Potential Biomarker for Breast Cancer Risk. *Breast Cancer: Basic and Clinical Research*, 4, 73–84. <https://doi.org/10.4137/BCBCR.S6307>
- Kozoviy, R. (2017). Frequency and Spectrum of Chromosomal Aberrations, Acrocentric Chromosome Associations Among Long Livers with Arterial Hypertension and Osteoarthritis Residing in the Carpathian Region. *Galician Medical Journal*, 24(1), 1–4. <https://doi.org/10.21802/gmj.2017.1.11>
- Lazo, J. S., Sharlow, E. R., Epperly, M. W., Lira, A., Leimgruber, S., Skoda, E. M., Wipf, P., & Greenberger, J. S. (2013). Pharmacologic profiling of phosphoinositide 3-kinase inhibitors as mitigators of ionizing radiation-induced cell deaths. *Journal of Pharmacology and Experimental Therapeutics*, 347(3), 669–680. <https://doi.org/10.1124/jpet.113.208421>
- Levan, A., Fredga, K., & Sandberg, A. A. (1964). Nomenclature for Centromeric Position on Chromosomes. *Hereditas*, 52(2), 201–220.
- Lezhava, T., Buadze, T., Mikaia, N., Jokhadze, T., Sigua, T., Gaiozishvili, M., & Melkadze, T. (2021). Epigenetic Activation of Ribosomal Cistrons in

Chromatids of Acrocentric Chromosome 15 in Lung Cancer. *Cytology and Genetics*, 55(5), 491–497. <https://doi.org/10.3103/S0095452721050042>

Lloyd, D. C., Dolphin, G. W., Purrott, R. J., & Tipper, P. A. (1977). The effect of x-ray induced mitotic delay on chromosome aberration yields in human lymphocytes. *Mutation Research - Fundamental and Molecular Mechanisms of Mutagenesis*, 42, 401–411. [https://doi.org/10.1016/S0027-5107\(77\)80045-6](https://doi.org/10.1016/S0027-5107(77)80045-6)

Lubis, M., & Indrawati, I. (2003). Pengaruh PHA dan SEA pada Indeks Mitosis Sel Limfosit Macaca fascicularis. *Prosiding Seminar Teknologi Keselamatan Radiasi Dan Biomedika Nuklir I*, 128–135.

Lubis, M., Sardini, S., & Ramadhani, D. (2016). Evaluation of Mitotic and Nuclear Division Indexes in Peripheral Blood Lymphocytes of Botteng Village, Mamuju Inhabitants. *2nd International Conference on the Sources, Effects and Risks of Ionizing Radiation (SERIR2) & 14th Biennial Conference of the South Pacific Environmental Radioactivity Association*, 1(1), 85–89.

Lusiyanti, Y., & Alatas, Z. (2016). Frekuensi Aberasi Kromosom pada Pekerja Radiasi. *Penelitian Dasar Ilmu Pengetahuan Dan Teknologi Nuklir 2016*, 81–86.

Luxton, J. J., McKenna, M. J., Taylor, L. E., George, K. A., Zwart, S. R., Crucian, B. E., Drel, V. R., Garrett-Bakelman, F. E., Mackay, M. J., Butler, D., Foon, J., Grigorev, K., Bezdán, D., Meydan, C., Smith, S. M., Sharma, K., Mason, C. E., & Bailey, S. M. (2020). Temporal Telomere and DNA Damage Responses in the Space Radiation Environment. *Cell Reports*, 33(10), 1–6. <https://doi.org/10.1016/j.celrep.2020.108435>

Mortazavi, S. M. J., Mortazavi, G. H., Mortazavi, S. A. R., & Paknahad, M. (2019). Is induction of anomalies in lymphocytes of the residents of high background radiation areas associated with increased cancer risk? *Journal of Biomedical Physics and Engineering*, 9(3), 367–372. <https://doi.org/10.31661/jbpe.v9i3jun.654>

Müssig, D. (2014). *Re-scanning in scanned ion beam therapy in the presence of organ motion*. <http://tuprints.ulb.tu-darmstadt.de/3858/>

Niazi, Y., Thomsen, H., Smolkova, B., Vodickova, L., Vodenkova, S., Kroupa, M., Vymetalkova, V., Kazimirova, A., Barancokova, M., Volkovova, K., Staruchova, M., Hoffmann, P., Nöthen, M. M., Dusinska, M., Musak, L., Vodicka, P., Hemminki, K., & Försti, A. (2021). DNA Repair Gene Polymorphisms and Chromosomal Aberrations in Exposed Populations. *Frontiers in Genetics*, 12(June), 1–9. <https://doi.org/10.3389/fgene.2021.691947>

Nishad, S., Chauhan, P. K., Sowdhamini, R., & Ghosh, A. (2021). Chronic exposure of humans to high level natural background radiation leads to robust expression of protective stress response proteins. *Scientific Reports*, 11(1). <https://doi.org/10.1038/s41598-020-80405-y>

- Nugraha, E. D., Hosoda, M., Kusdiana, Untara, Mellawati, J., Nurokhim, Tamakuma, Y., Ikram, A., Syaifudin, M., Yamada, R., Akata, N., Sasaki, M., Furukawa, M., Yoshinaga, S., Yamaguchi, M., Miura, T., Kashiwakura, I., & Tokonami, S. (2021). Comprehensive exposure assessments from the viewpoint of health in a unique high natural background radiation area, Mamuju, Indonesia. *Scientific Reports*, *11*(1). <https://doi.org/10.1038/s41598-021-93983-2>
- Nurokhim, Kusdiana, & Pudjadi, E. (2020). Assessment of natural radioactivity levels in soil sample from Botteng Utara Village, Mamuju Regency Indonesia. *Journal of Physics: Conference Series*, *1436*(1). <https://doi.org/10.1088/1742-6596/1436/1/012139>
- Potapova, T. A., Unruh, J. R., Yu, Z., Rancati, G., Li, H., Stampfer, M. R., & Gerton, J. L. (2019). Superresolution microscopy reveals linkages between ribosomal DNA on heterologous chromosomes. *Journal of Cell Biology*, *218*(8), 2492–2513. <https://doi.org/10.1083/JCB.201810166>
- Purnami, S., Lubis, M., Suryadi, & Syaifudin, M. (2020). The assessment of mitotic and nuclear division indexes as biomarkers for estimating the risk on the health of residents exposed to the high natural radiation of Mamuju, West Sulawesi. *Journal of Physics: Conference Series*, *1436*(1), 012032. <https://doi.org/10.1088/1742-6596/1436/1/012032>
- Ramadhani, D., Nurhayati, S., Rahardjo, T., Pudjadi, E., & Syaifudin, M. (2018). Lymphocyte proliferation kinetics in inhabitant of Takandeang Village, Mamuju: A high background radiation areas in Indonesia. *Indonesian Biomedical Journal*, *10*(1), 66–73. <https://doi.org/10.18585/inabj.v10i1.357>
- Ramadhani, D., Purnami, S., Nurhayati, S., Pudjadi, E., & Syaifudin, M. (2018). In vitro radiosensitivity of lymphocytes from high-background radiation ar- ea inhabitants in Indonesia: a pilot study using the G0 micronucleus assay. *Berkala Penelitian Hayati*, *24*(1), 1–7. <https://doi.org/10.23869/bphjbr.24.1.20181>
- Ramadhani, D., Suvifan, V. A., & Lusiyanti, Y. (2013). Otomatisasi Pendeteksian Sel Blast dan Sel Metafase dengan Perangkat Lunak Pengolahan Citra Sumber Terbuka. *Seminar Nasional Aplikasi Teknologi Informasi (SNATI) 2013*, 12–17.
- Rinendyaputri, R., & Dany, F. (2015). Optimasi Penambahan Colcemid pada Karyotyping Kultur Mecenchymal Stem Cells (MSC) Mencit. *Buletin Penelitian Kesehatan*, *43*(4), 231–238. <https://doi.org/10.22435/bpk.v43i4.4598.231-238>
- Rubin, P., & Casarett, G. W. (1968). Clinical radiation pathology as applied to curative radiotherapy. *Cancer*, *22*(4), 767–778. [https://doi.org/10.1002/1097-0142\(196810\)22:4<767::AID-CNCR2820220412>3.0.CO;2-7](https://doi.org/10.1002/1097-0142(196810)22:4<767::AID-CNCR2820220412>3.0.CO;2-7)
- Salem, M. S. Z. (2013). Basic concepts of medical genetics, pathogenetics, Part 2. *Egyptian Journal of Medical Human Genetics*, *14*, 117–122. <https://doi.org/10.1016/j.ejmhg.2012.08.009>

- Samarth, R. M., Gandhi, P., & Chaudhury, N. K. (2022). Linear dose response of acrocentric chromosome associations to gamma irradiation in human lymphocytes. *Strahlentherapie Und Onkologie*.
<https://doi.org/10.1007/s00066-022-01978-3>
- Scott, B. R. (2014). Radiation Toxicology, Ionizing and Nonionizing. In *Encyclopedia of Toxicology* (Third Edit, Vol. 4, pp. 29–43). Elsevier.
<https://doi.org/10.1016/B978-0-12-386454-3.00057-9>
- Shahbazi-Gahrouei, D., Setayandeh, S., & Gholami, M. (2013). A review on natural background radiation. *Advanced Biomedical Research*, 2(1), 65.
<https://doi.org/10.4103/2277-9175.115821>
- Shilfa, S. N., Jumpeno, B. Y. E. B., Nurokhim, & Kusdiana. (2020). Ambient dose measurement from high natural background radiation (HNBR) in Botteng Utara Village, Mamuju-Indonesia. *Journal of Physics: Conference Series*, 1436(1), 1–6. <https://doi.org/10.1088/1742-6596/1436/1/012027>
- Shimura, N., & Kojima, S. (2018). The Lowest Radiation Dose Having Molecular Changes in the Living Body. *Dose-Response*, 16(2), 1–17.
<https://doi.org/10.1177/1559325818777326>
- Sinitsky, M. Y., & Druzhinin, V. G. (2014). The application of the cytokinesis-block micronucleus assay on peripheral blood lymphocytes for the assessment of genome damage in long-term residents of areas with high radon concentration. *Journal of Radiation Research*, 55, 61–66.
<https://doi.org/10.1093/jrr/rrt091>
- Smith, M. A. F., & Handmaker, S. D. (1961). Observations on The Satellited Human Chromosomes. *The Lancet*, 277(7178), 638–640.
- Sohrabi, M. (2013). World high background natural radiation areas: Need to protect public from radiation exposure. *Radiation Measurements*, 50, 166–171.
<https://doi.org/10.1016/j.radmeas.2012.03.011>
- Sutapa, G. N., Widyasari, N. L., & Dewi, N. K. A. A. (2013). Mendalami Respon Adaptasi Sel Terhadap Paparan Radiasi Pengion. *Buletin Alara*, 15(1), 9–14.
- Syaeful, H., Sukadana, I. G., & Sumaryanto, A. (2014). Radiometric Mapping for Naturally Occurring Radioactive Materials (NORM) Assessment in Mamuju, West Sulawesi. *Atom Indonesia*, 40(1), 33–39.
- Tsai, C. J., Chang, K. W., Yang, B. H., Wu, P. H., Lin, K. H., Wong, C. Y. O., Lee, H. L., & Huang, W. S. (2022). Very-Low-Dose Radiation and Clinical Molecular Nuclear Medicine. *Life*, 12(6), 1–10.
<https://doi.org/10.3390/life12060912>
- Tushar Chauhan, Jigar Suthar, Rajesh Kumar Patel, M. P. (2016). Impact of Time and Temperature during Transportation of Blood Samples on Lymphocyte Culture and Chromosomal Preparation. *Journal of Chemical, Biological and Physical Sciences*, 6(2), 549–553.
- United Nations Scientific Committee on the Effects of Atomic Radiation. (2000).

Sources and Effects of Ionizing Radiation.

- van Sluis, M., van Vuuren, C., Mangan, H., & McStay, B. (2020). NORs on human acrocentric chromosome p-arms are active by default and can associate with nucleoli independently of rDNA. *Proceedings of the National Academy of Sciences of the United States of America*, 117(19), 10368–10377. <https://doi.org/10.1073/pnas.2001812117>
- Vignard, J., Mirey, G., & Salles, B. (2013). Ionizing-radiation induced DNA double-strand breaks: A direct and indirect lighting up. *Radiotherapy and Oncology*, 108(3), 362–369. <https://doi.org/10.1016/j.radonc.2013.06.013>
- Wirsdörfer, F., & Jendrossek, V. (2016). The role of lymphocytes in radiotherapy-induced adverse late effects in the lung. *Frontiers in Immunology*, 7(591), 1–20. <https://doi.org/10.3389/fimmu.2016.00591>
- Woroprobosari, N. R. (2016). Efek Stokastik Radiasi Sinar-X Dental Pada Ibu Hamil Dan Janin. *ODONTO: Dental Journal*, 3(1), 60–66. <https://doi.org/10.30659/odj.3.1.60-66>
- Yamaguchi, M., Tatara, Y., Nugraha, E. D., Ramadhani, D., Tamakuma, Y., Sato, Y., Miura, T., Hosoda, M., Yoshinaga, S., Syaifudin, M., Kashiwakura, I., & Tokonami, S. (2022). Detection of biological responses to low-dose radiation in humans. *Free Radical Biology and Medicine*, 184(April), 196–207. <https://doi.org/10.1016/j.freeradbiomed.2022.04.006>
- Yamaguchi, M., Tatara, Y., Nugraha, E. D., Tamakuma, Y., Sato, Y., Miura, T., Hosoda, M., Yoshinaga, S., Syaifudin, M., Tokonami, S., & Kashiwakura, I. (2022). Oxidative Modification Status of Human Serum Albumin Caused by Chronic Low-Dose Radiation Exposure in Mamuju, Sulawesi, Indonesia. *Antioxidants*, 11(12), 1–13. <https://doi.org/10.3390/antiox11122384>
- Zang, K. D., & Back, E. (1968). Quantitative studies on the arrangement of human metaphase chromosomes - VIII. Localization of homologous chromosomes. *Cytogenetics*, 7(3), 455–470. <https://doi.org/10.1007/BF00303011>
- Zhao, Y., Zhong, R., Sun, L., Jia, J., Ma, S., & Liu, X. (2015). Ionizing radiation-induced adaptive response in fibroblasts under both monolayer and 3-dimensional conditions. *PLOS ONE*, 10(3), 1–13. <https://doi.org/10.1371/journal.pone.0121289>