

## DAFTAR PUSTAKA

- Abenojar, E. C., Wickramasinghe, S., Bas-Concepcion, J., & Samia, A. C. S. (2016). Structural effects on the magnetic hyperthermia properties of iron oxide nanoparticles. *Progress in Natural Science: Materials International*, 26(5), 440–448. <https://doi.org/10.1016/j.pnsc.2016.09.004>
- Abosheiasha, H. F., & Assar, S. T. (2014). Effects of sintering process on the structural, magnetic and thermal properties of Ni<sub>0.92</sub>Ca<sub>0.08</sub>Fe<sub>2</sub>O<sub>4</sub> nanoferrite. *Journal of Magnetism and Magnetic Materials*, 370, 54–61. <https://doi.org/10.1016/j.jmmm.2014.06.054>
- Aisida, S. O., Ugwu, K., Akpa, P. A., Nwanya, A. C., Nwankwo, U., Bashir, A. K. H., Madiba, I. G., Ahmed, I., & Ezema, F. I. (2019). Synthesis and characterization of iron oxide nanoparticles capped with Moringa Oleifera: The mechanisms of formation effects on the optical, structural, magnetic and morphological properties. *Materials Today: Proceedings*, 36, 214–218. <https://doi.org/10.1016/j.matpr.2020.03.167>
- Alkhayal, A., Fathima, A., Alhasan, A. H., & Alsharaeh, E. H. (2021). Peg coated Fe<sub>3</sub>O<sub>4</sub>/RGO nano-cube-like structures for cancer therapy via magnetic hyperthermia. *Nanomaterials*, 11(9). <https://doi.org/10.3390/nano11092398>
- Allegretta, I., Legrand, S., Alfeld, M., Gattullo, C. E., Porfido, C., Spagnuolo, M., Janssens, K., & Terzano, R. (2022). SEM-EDX hyperspectral data analysis for the study of soil aggregates. *Geoderma*, 406, 115540. <https://doi.org/10.1016/j.geoderma.2021.115540>
- Ansari, S. A. M. K., Ficiarà, E., Ruffinatti, F. A., Stura, I., Argenziano, M., Abollino, O., Cavalli, R., Guiot, C., & D'Agata, F. (2019). Magnetic iron oxide nanoparticles: Synthesis, characterization and functionalization for biomedical applications in the Central Nervous System. *Materials*, 12(3). <https://doi.org/10.3390/ma12030465>
- Arruebo, M., Fernández-Pacheco, R., Ibarra, M. R., & Santamaría, J. (2007). Magnetic nanoparticles for drug delivery. *Nano Today*, 2(3), 22–32. [https://doi.org/10.1016/S1748-0132\(07\)70084-1](https://doi.org/10.1016/S1748-0132(07)70084-1)
- Bandi, S., Hastak, V., Pavithra, C. L. P., Kashyap, S., Singh, D. K., Luqman, S., Peshwe, D. R., & Srivastav, A. K. (2019). Graphene/chitosan-functionalized iron oxide nanoparticles for biomedical applications. *Journal of Materials Research*, 34(20), 3389–3399. <https://doi.org/10.1557/jmr.2019.267>
- Bharti, C., Nagaich, U., Pal, A. K., & Gulati, N. (2015). Mesoporous silica nanoparticles in target drug delivery system: A review. *International Journal of*

- Pharmaceutical Investigation*, 5(3), 124–133. <https://doi.org/10.4103/2230-973X.160844>
- Bindhu, M. R., Umadevi, M., Esmail, G. A., Al-Dhabi, N. A., & Arasu, M. V. (2020). Green synthesis and characterization of silver nanoparticles from *Moringa oleifera* flower and assessment of antimicrobial and sensing properties. *Journal of Photochemistry and Photobiology B: Biology*, 205(January), 111836. <https://doi.org/10.1016/j.jphotobiol.2020.111836>
- Chen, L., Sun, H., Zhao, Y., Zhang, Y., Wang, Y., Liu, Y., Zhang, X., Jiang, Y., Hua, Z., & Yang, J. (2017). Plasmonic-induced SERS enhancement of shell-dependent Ag@Cu<sub>2</sub>O core-shell nanoparticles. *RSC Advances*, 7(27), 16553–16560. <https://doi.org/10.1039/C7RA01187C>
- Chi, Y., Yuan, Q., Li, Y., Tu, J., Zhao, L., Li, N., & Li, X. (2012). Synthesis of Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub>-Ag magnetic nanocomposite based on small-sized and highly dispersed silver nanoparticles for catalytic reduction of 4-nitrophenol. *Journal of Colloid and Interface Science*, 383(1), 96–102. <https://doi.org/10.1016/j.jcis.2012.06.027>
- Chou, C. K. (1990). Use of heating rate and specific absorption rate in the hyperthermia clinic. *International Journal of Hyperthermia : The Official Journal of European Society for Hyperthermic Oncology, North American Hyperthermia Group*, 6(2), 367–370. <https://doi.org/10.3109/02656739009141144>
- Coey, J. M. D. (Ed.). (2010). Magnetic materials. In *Magnetism and Magnetic Materials* (hal. 374–438). Cambridge University Press. <https://doi.org/DOI:10.1017/CBO9780511845000.012>
- Darwish, M. S. A., Al-Harbi, L. M., & Bakry, A. (2022). Synthesis of magnetite nanoparticles coated with polyvinyl alcohol for hyperthermia application. *Journal of Thermal Analysis and Calorimetry*. <https://doi.org/10.1007/s10973-022-11393-6>
- Das, P. K., Mallik, A. K., Ganguly, R., & Santra, A. K. (2018). Stability and thermophysical measurements of TiO<sub>2</sub>(anatase) nanofluids with different surfactants. *Journal of Molecular Liquids*, 254, 98–107. <https://doi.org/10.1016/j.molliq.2018.01.075>
- Das, R., Alonso, J., Nemati Porshokouh, Z., Kalappattil, V., Torres, D., Phan, M. H., Garaio, E., García, J. Á., Sanchez Llamazares, J. L., & Srikanth, H. (2016). Tunable High Aspect Ratio Iron Oxide Nanorods for Enhanced Hyperthermia. *Journal of Physical Chemistry C*, 120(18), 10086–10093. <https://doi.org/10.1021/acs.jpcc.6b02006>
- Dash, A., Ahmed, M. T., & Selvaraj, R. (2019). Mesoporous magnetite nanoparticles

- synthesis using the *Peltophorum pterocarpum* pod extract, their antibacterial efficacy against pathogens and ability to remove a pollutant dye. *Journal of Molecular Structure*, 1178, 268–273. <https://doi.org/https://doi.org/10.1016/j.molstruc.2018.10.042>
- Deatsch, A. E., & Evans, B. A. (2014). Heating efficiency in magnetic nanoparticle hyperthermia. *Journal of Magnetism and Magnetic Materials*, 354, 163–172. <https://doi.org/10.1016/j.jmmm.2013.11.006>
- Delice, S., Isik, M., & Gasanly, N. M. (2024). Temperature-dependent tuning of band gap of Fe<sub>3</sub>O<sub>4</sub> nanoparticles for optoelectronic applications. *Chemical Physics Letters*, 840(December 2023), 141139. <https://doi.org/10.1016/j.cplett.2024.141139>
- Di Corato, R., Palumberi, D., Marotta, R., Scotto, M., Carregal-Romero, S., Rivera\_Gil, P., Parak, W. J., & Pellegrino, T. (2012). Magnetic Nanobeads Decorated with Silver Nanoparticles as Cytotoxic Agents and Photothermal Probes. *Small*, 8(17), 2731–2742. <https://doi.org/10.1002/sml.201200230>
- Du, J., & Jing, C. (2011). Preparation of Fe<sub>3</sub>O<sub>4</sub>@Ag SERS substrate and its application in environmental Cr(VI) analysis. *Journal of Colloid and Interface Science*, 358(1), 54–61. <https://doi.org/10.1016/j.jcis.2011.02.044>
- Engelmann, U. M., Fitter, J. L., & Baumann, M. (2019). *Assessing magnetic fluid hyperthermia: magnetic relaxation simulation, modeling of nanoparticle uptake inside pancreatic tumor cells and in vitro efficacy*. PhD.
- Faiyas, A. P. A., Vinod, E. M., Joseph, J., Ganesan, R., & Pandey, R. K. (2010). Dependence of pH and surfactant effect in the synthesis of magnetite (Fe<sub>3</sub>O<sub>4</sub>) nanoparticles and its properties. *Journal of Magnetism and Magnetic Materials*, 322(4), 400–404. <https://doi.org/10.1016/j.jmmm.2009.09.064>
- Gadgeel, A. A., Mhaske, S. T., Duerr, C., & Liu, K. L. (2019). In-Situ Preparation and Characterization of Aconitic Acid Capped Fe<sub>3</sub>O<sub>4</sub> Nanoparticle by Using Citric Acid as a Reducing Agent. *Journal of Inorganic and Organometallic Polymers and Materials*, 29(5), 1688–1700. <https://doi.org/10.1007/s10904-019-01131-1>
- Gahlawat, G., & Choudhury, A. R. (2019). A review on the biosynthesis of metal and metal salt nanoparticles by microbes. *RSC Advances*, 9(23), 12944–12967. <https://doi.org/10.1039/C8RA10483B>
- Ganzoury, M. A., Allam, N. K., Nicolet, T., & All, C. (2015). Introduction to Fourier Transform Infrared Spectrometry. *Renewable and Sustainable Energy Reviews*, 50, 1–8. <https://doi.org/10.1016/j.rser.2015.05.073>
- Ghanbari, D., Salavati-Niasari, M., Khaghani, S., & Beshkar, F. (2016). Preparation of Polyvinyl Acetate (PVAc) and PVAc–Ag–Fe<sub>3</sub>O<sub>4</sub> Composite Nanofibers by

- Electro-spinning Method. *Journal of Cluster Science*, 27(4), 1317–1333.  
<https://doi.org/10.1007/s10876-016-1002-2>
- Ghaseminezhad, S. M., & Shojaosadati, S. A. (2016). Evaluation of the antibacterial activity of Ag/Fe<sub>3</sub>O<sub>4</sub> nanocomposites synthesized using starch. *Carbohydrate Polymers*, 144, 454–463. <https://doi.org/10.1016/j.carbpol.2016.03.007>
- Gonçalves, J., Nunes, C., Ferreira, L., Cruz, M. M., Oliveira, H., Bastos, V., Mayoral, Á., Zhang, Q., & Ferreira, P. (2021). Coating of magnetite nanoparticles with fucoidan to enhance magnetic hyperthermia efficiency. *Nanomaterials*, 11(11), 1–20. <https://doi.org/10.3390/nano11112939>
- Goya, G. F., Lima, E., Arelaro, A. D., Torres, T., Rechenberg, H. R., Rossi, L., Marquina, C., & Ibarra, M. R. (2008). Magnetic hyperthermia with Fe<sub>3</sub>O<sub>4</sub> nanoparticles: The influence of particle size on energy absorption. *IEEE Transactions on Magnetics*, 44(11 PART 2), 4444–4447. <https://doi.org/10.1109/TMAG.2008.2003508>
- Guelcher, S. A., Srinivasan, A., Dumas, J. E., Didier, J. E., McBride, S., & Hollinger, J. O. (2008). Synthesis, mechanical properties, biocompatibility, and biodegradation of polyurethane networks from lysine polyisocyanates. *Biomaterials*, 29(12), 1762–1775. <https://doi.org/10.1016/j.biomaterials.2007.12.046>
- Häfeli, U. O., Aue, J., & Damani, J. (2007). The biocompatibility and toxicity of magnetic particles. In *Magnetic Cell Separation* (Vol. 32, hal. 163–223). Elsevier. [https://doi.org/10.1016/S0075-7535\(06\)32007-4](https://doi.org/10.1016/S0075-7535(06)32007-4)
- Haider, W., Munroe, N., Pulletikurthi, C., Singh Gill, P. K., & Amruthaluri, S. (2009). A Comparative Biocompatibility Analysis of Ternary Nitinol Alloys. *Journal of Materials Engineering and Performance*, 18(5–6), 760–764. <https://doi.org/10.1007/s11665-009-9435-5>
- Hajalilou, A., Etemadifar, R., Abbasi-Chianeh, V., & Abouzari-Lotf, E. (2018). Electrophoretically-Deposited Nano-Fe<sub>3</sub>O<sub>4</sub>@carbon 3D Structure on Carbon Fiber as High-Performance Supercapacitors. *Journal of Electronic Materials*, 47(8), 4807–4812. <https://doi.org/10.1007/s11664-018-6360-0>
- Hajalilou, A., Ferreira, L. P., Melo Jorge, M. E., Reis, C. P., & Cruz, M. M. (2021). Superparamagnetic Ag-Fe<sub>3</sub>O<sub>4</sub> composites nanoparticles for magnetic fluid hyperthermia. *Journal of Magnetism and Magnetic Materials*, 537(March), 168242. <https://doi.org/10.1016/j.jmmm.2021.168242>
- Hajalilou, A., & Mazlan, S. A. (2016). A review on preparation techniques for synthesis of nanocrystalline soft magnetic ferrites and investigation on the effects of microstructure features on magnetic properties. *Applied Physics A: Materials*

*Science and Processing*, 122(7), 1–15. <https://doi.org/10.1007/s00339-016-0217-2>

- Hammad, T. M., Salem, J. K., Amsha, A. A., & Hejazy, N. K. (2018). Optical and magnetic characterizations of zinc substituted copper ferrite synthesized by a coprecipitation chemical method. *Journal of Alloys and Compounds*, 741, 123–130. <https://doi.org/10.1016/j.jallcom.2018.01.123>
- Hedayatnasab, Z., Abnisa, F., & Daud, W. M. A. W. (2017). Review on magnetic nanoparticles for magnetic nanofluid hyperthermia application. *Materials & Design*, 123, 174–196. <https://doi.org/10.1016/j.matdes.2017.03.036>
- Huang, R., Shen, Y.-W., Guan, Y.-Y., Jiang, Y.-X., Wu, Y., Rahman, K., Zhang, L.-J., Liu, H.-J., & Luan, X. (2020). Mesoporous silica nanoparticles: facile surface functionalization and versatile biomedical applications in oncology. *Acta Biomaterialia*, 116, 1–15. <https://doi.org/10.1016/j.actbio.2020.09.009>
- Inkson, B. J. (2016). Scanning electron microscopy (SEM) and transmission electron microscopy (TEM) for materials characterization. In G. Hübschen, I. Altpeter, R. Tschuncky, & H.-G. B. T.-M. C. U. N. E. (NDE) M. Herrmann (Ed.), *Materials Characterization Using Nondestructive Evaluation (NDE) Methods* (hal. 17–43). Elsevier. <https://doi.org/10.1016/B978-0-08-100040-3.00002-X>
- Issa, B., Obaidat, I. M., Albiss, B. A., & Haik, Y. (2013). Magnetic nanoparticles: Surface effects and properties related to biomedicine applications. *International Journal of Molecular Sciences*, 14(11), 21266–21305. <https://doi.org/10.3390/ijms141121266>
- Jamir, M., Borgohain, C., & Borah, J. P. (2023). Influence of structure and magnetic properties of surface modified nanoparticles for hyperthermia application. *Physica B: Condensed Matter*, 648, 414405. <https://doi.org/10.1016/j.physb.2022.414405>
- Jang, H., Kim, Y.-K., Huh, H., & Min, D.-H. (2014). Facile Synthesis and Intraparticle Self-Catalytic Oxidation of Dextran-Coated Hollow Au–Ag Nanoshell and Its Application for Chemo-Thermotherapy. *ACS Nano*, 8(1), 467–475. <https://doi.org/10.1021/nn404833b>
- Javed, R., Zia, M., Naz, S., Aisida, S. O., Ain, N. ul, & Ao, Q. (2020). Role of capping agents in the application of nanoparticles in biomedicine and environmental remediation: recent trends and future prospects. *Journal of Nanobiotechnology*, 18(1), 1–15. <https://doi.org/10.1186/s12951-020-00704-4>
- Jeun, M., Lee, S., Kyeong Kang, J., Tomitaka, A., Wook Kang, K., Il Kim, Y., Takemura, Y., Chung, K. W., Kwak, J., & Bae, S. (2012). Physical limits of pure superparamagnetic Fe<sub>3</sub>O<sub>4</sub> nanoparticles for a local hyperthermia agent in

- nanomedicine. *Applied Physics Letters*, *100*(9), 3–7.  
<https://doi.org/10.1063/1.3689751>
- Jiananda, A., Sari, E. K., Larasati, D. A., Tumbelaka, R. M., Ardiyanti, H., Darmawan, M. Y., Istiqomah, N. I., Sunaryono, Wicaksono, S. T., & Suharyadi, E. (2023). Optical, microstructural, and magnetic hyperthermia properties of green-synthesized Fe<sub>3</sub>O<sub>4</sub>/carbon dots nanocomposites utilizing Moringa oleifera extract and watermelon rinds. *Carbon Trends*, *13*, 100305.  
<https://doi.org/10.1016/j.cartre.2023.100305>
- Juwita, E., Sulistiani, F. A., Darmawan, M. Y., & Istiqomah, N. I. (2022). Microstructural, optical, and magnetic properties and specific absorption rate of bismuth ferrite/SiO<sub>2</sub> nanoparticles. *Materials Research Express*, *9*(7), 76101.
- Kandasamy, G., Sudame, A., Bhati, P., Chakrabarty, A., & Maity, D. (2018). Systematic investigations on heating effects of carboxyl-amine functionalized superparamagnetic iron oxide nanoparticles (SPIONs) based ferrofluids for in vitro cancer hyperthermia therapy. *Journal of Molecular Liquids*, *256*, 224–237.  
<https://doi.org/10.1016/j.molliq.2018.02.029>
- Karade, V. C., Parit, S. B., Dawkar, V. V., Devan, R. S., Choudhary, R. J., Kedge, V. V., Pawar, N. V., Kim, J. H., & Chougale, A. D. (2019). A green approach for the synthesis of  $\alpha$ -Fe<sub>2</sub>O<sub>3</sub> nanoparticles from Gardenia resinifera plant and its in vitro hyperthermia application. *Heliyon*, *5*(7), e02044.  
<https://doi.org/10.1016/j.heliyon.2019.e02044>
- Karade, V. C., Waifalkar, P. P., Dongle, T. D., Sahoo, S. C., Kollu, P., Patil, P. S., & Patil, P. B. (2017). Greener synthesis of magnetite nanoparticles using green tea extract and their magnetic properties. *Materials Research Express*, *4*(9).  
<https://doi.org/10.1088/2053-1591/aa892f>
- Karaman Dennis O, I. L. (2005). *Residual stress measurement using X-ray diffraction* (Nomor Desember). <https://oaktrust.library.tamu.edu/handle/1969.1/1507>
- Katata-Seru, L., Moremedi, T., Aremu, O. S., & Bahadur, I. (2018). Green synthesis of iron nanoparticles using Moringa oleifera extracts and their applications: Removal of nitrate from water and antibacterial activity against Escherichia coli. *Journal of Molecular Liquids*, *256*, 296–304. <https://doi.org/10.1016/j.molliq.2017.11.093>
- Kawashita, M., Domi, S., Saito, Y., Aoki, M., Ebisawa, Y., Kokubo, T., Saito, T., Takano, M., Araki, N., & Hiraoka, M. (2008). In vitro heat generation by ferrimagnetic maghemite microspheres for hyperthermic treatment of cancer under an alternating magnetic field. *Journal of Materials Science. Materials in Medicine*, *19*(5), 1897–1903. <https://doi.org/10.1007/s10856-007-3262-8>
- Khatoun, U. T., Rao, K. V., Rao, J. V. R., & Aparna, Y. (2011). Synthesis and

- characterization of silver nanoparticles by chemical reduction method. *International Conference on Nanoscience, Engineering and Technology (ICONSET 2011)*, 97–99. <https://doi.org/10.1109/ICONSET.2011.6167920>
- Kiwumulo, H. F., Muwonge, H., Ibingira, C., Lubwama, M., Kirabira, J. B., & Ssekitoleko, R. T. (2022). Green synthesis and characterization of iron-oxide nanoparticles using *Moringa oleifera*: a potential protocol for use in low and middle income countries. *BMC Research Notes*, *15*(1), 1–8. <https://doi.org/10.1186/s13104-022-06039-7>
- Knetsch, M. L. W., & Koole, L. H. (2011). New strategies in the development of antimicrobial coatings: The example of increasing usage of silver and silver nanoparticles. *Polymers*, *3*(1), 340–366. <https://doi.org/10.3390/polym3010340>
- Kumar, A. J., Leeds, N. E., Fuller, G. N., Van Tassel, P., Maor, M. H., Sawaya, R. E., & Levin, V. A. (2000). Malignant gliomas: MR imaging spectrum of radiation therapy-and chemotherapy-induced necrosis of the brain after treatment. *Radiology*, *217*(2), 377–384. <https://doi.org/10.1148/radiology.217.2.r00nv36377>
- Kumar, B., Smita, K., Cumbal, L., Debut, A., Galeas, S., & Guerrero, V. H. (2016). Phytosynthesis and photocatalytic activity of magnetite (Fe<sub>3</sub>O<sub>4</sub>) nanoparticles using the Andean blackberry leaf. *Materials Chemistry and Physics*, *179*, 310–315. <https://doi.org/10.1016/j.matchemphys.2016.05.045>
- Kumar, L., Kumar, P., & Kar, M. (2013). Cation distribution by Rietveld technique and magnetocrystalline anisotropy of Zn substituted nanocrystalline cobalt ferrite. *Journal of Alloys and Compounds*, *551*, 72–81. <https://doi.org/10.1016/j.jallcom.2012.10.009>
- Kumar, R., Chauhan, A., & Kuanr, B. K. (2021). A robust in vitro anticancer activity via magnetic hyperthermia mediated by colloiddally stabilized mesoporous silica encapsulated La<sub>0.7</sub>Sr<sub>0.3</sub>MnO<sub>3</sub> core-shell structure. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, *615*(January), 126212. <https://doi.org/10.1016/j.colsurfa.2021.126212>
- Kurtan, U., & Baykal, A. (2014). Fabrication and characterization of Fe<sub>3</sub>O<sub>4</sub>@APTES@PAMAM-Ag highly active and recyclable magnetic nanocatalyst: Catalytic reduction of 4-nitrophenol. *Materials Research Bulletin*, *60*, 79–87. <https://doi.org/10.1016/j.materresbull.2014.08.016>
- Kurti, N. (1988). *Selected Works of Louis Neel*. CRC Press. <https://doi.org/10.1201/9780367810580>
- Lak, A. (2013). *Synthesis and Characterization of Magnetic Iron Oxide Nanoparticles* (Vol. 44) [Mensch und Buch]. <https://doi.org/10.24355/dbbs.084-201404040818-0>

- Lavorato, G., Lima, E., Vasquez Mansilla, M., Troiani, H., Zysler, R., & Winkler, E. (2018). Bifunctional CoFe<sub>2</sub>O<sub>4</sub>/ZnO Core/Shell Nanoparticles for Magnetic Fluid Hyperthermia with Controlled Optical Response. *Journal of Physical Chemistry C*, 122(5), 3047–3057. <https://doi.org/10.1021/acs.jpcc.7b11115>
- Li, N., Huang, G.-W., Shen, X.-J., Xiao, H.-M., & Fu, S.-Y. (2013). Controllable fabrication and magnetic-field assisted alignment of Fe<sub>3</sub>O<sub>4</sub>-coated Ag nanowires via a facile co-precipitation method. *Journal of Materials Chemistry C*, 1(32), 4879–4884. <https://doi.org/10.1039/C3TC30270A>
- Li, Q., Kartikowati, C. W., Horie, S., Ogi, T., Iwaki, T., & Okuyama, K. (2017). Correlation between particle size/domain structure and magnetic properties of highly crystalline Fe<sub>3</sub>O<sub>4</sub> nanoparticles. *Scientific Reports*, 7(1), 9894. <https://doi.org/10.1038/s41598-017-09897-5>
- Lian, Y., Wang, L., Cao, J., Liu, T., Xu, Z., Yang, B., Huang, T., Jiang, X., & Wu, N. (2021). Recent advances on the magnetic nanoparticle-based nanocomposites for magnetic induction hyperthermia of tumor: a short review. *Advanced Composites and Hybrid Materials*, 4(4), 925–937. <https://doi.org/10.1007/s42114-021-00373-3>
- Liu, L., Ni, F., Zhang, J., Jiang, X., Lu, X., Guo, Z., & Xu, R. (2011). Silver nanocrystals sensitize magnetic-nanoparticle-mediated thermo-induced killing of cancer cells. *Acta Biochimica et Biophysica Sinica*, 43(4), 316–323. <https://doi.org/10.1093/abbs/gmr015>
- Lu, Q., Dai, X., Zhang, P., Tan, X., Zhong, Y., Yao, C., Song, M., Song, G., Zhang, Z., Peng, G., Guo, Z., Ge, Y., Zhang, K., & Li, Y. (2018). Fe<sub>3</sub>O<sub>4</sub>@Au composite magnetic nanoparticles modified with cetuximab for targeted magneto-photothermal therapy of glioma cells. *International Journal of Nanomedicine*, 13, 2491–2505. <https://doi.org/10.2147/IJN.S157935>
- Lu, W., Shen, Y., Xie, A., & Zhang, W. (2010). Green synthesis and characterization of superparamagnetic Fe<sub>3</sub>O<sub>4</sub> nanoparticles. *Journal of Magnetism and Magnetic Materials*, 322(13), 1828–1833. <https://doi.org/10.1016/j.jmmm.2009.12.035>
- Mabarroh, N., Alfansuri, T., Aji Wibowo, N., Imani Istiqomah, N., Marsel Tumbelaka, R., & Suharyadi, E. (2022). Detection of green-synthesized magnetite nanoparticles using spin-valve GMR-based sensor and their potential as magnetic labels. *Journal of Magnetism and Magnetic Materials*, 560(April), 169645. <https://doi.org/10.1016/j.jmmm.2022.169645>
- Mahmoudi, M., & Serpooshan, V. (2012). Silver-Coated Engineered Magnetic Nanoparticles Are Promising for the Success in the Fight against Antibacterial Resistance Threat. *ACS Nano*, 6(3), 2656–2664. <https://doi.org/10.1021/nn300042m>

- Maier-Hauff, K., Ulrich, F., Nestler, D., Niehoff, H., Wust, P., Thiesen, B., Orawa, H., Budach, V., & Jordan, A. (2011). Efficacy and safety of intratumoral thermotherapy using magnetic iron-oxide nanoparticles combined with external beam radiotherapy on patients with recurrent glioblastoma multiforme. *Journal of Neuro-Oncology*, *103*(2), 317–324. <https://doi.org/10.1007/s11060-010-0389-0>
- Mallenakuppe, R., Homabalegowda, H., Gouri, M. D., Basavaraju, P. S., & Chandrashekharaiah, U. B. (2019). History, Taxonomy and Propagation of *Moringa oleifera*-A Review. *SSR Institute of International Journal of Life Sciences*, *5*(3), 2322–2327. <https://doi.org/10.21276/ssr-ijls.2019.5.3.7>
- Martinez-Boubeta, C., Simeonidis, K., Oró, J., Makridis, A., Serantes, D., & Balcells, L. (2021). Finding the limits of magnetic hyperthermia on core-shell nanoparticles fabricated by physical vapor methods. *Magnetochemistry*, *7*(4), 1–14. <https://doi.org/10.3390/magnetochemistry7040049>
- Mateus, G. A. P., dos Santos, T. R. T., Sanches, I. S., Silva, M. F., de Andrade, M. B., Paludo, M. P., Gomes, R. G., & Bergamasco, R. (2020). Evaluation of a magnetic coagulant based on Fe<sub>3</sub>O<sub>4</sub> nanoparticles and *Moringa oleifera* extract on tartrazine removal: coagulation-adsorption and kinetics studies. *Environmental Technology (United Kingdom)*, *41*(13), 1648–1663. <https://doi.org/10.1080/09593330.2018.1543358>
- Mateus, G. A. P., Paludo, M. P., Dos Santos, T. R. T., Silva, M. F., Nishi, L., Fagundes-Klen, M. R., Gomes, R. G., & Bergamasco, R. (2018). Obtaining drinking water using a magnetic coagulant composed of magnetite nanoparticles functionalized with *Moringa oleifera* seed extract. *Journal of Environmental Chemical Engineering*, *6*(4), 4084–4092. <https://doi.org/10.1016/j.jece.2018.05.050>
- Matula, R. A. (1979). Electrical resistivity of copper, gold, palladium, and silver. *Journal of Physical and Chemical Reference Data*, *8*(4), 1147–1298. <https://doi.org/10.1063/1.555614>
- Meftah, N., Hani, A., & Merdas, A. (2023). Extraction and Physicochemical Characterization of Highly-pure Amorphous Silica Nanoparticles from Locally Available Dunes Sand. *Chemistry Africa*, *6*(6), 3039–3048. <https://doi.org/10.1007/s42250-023-00688-2>
- Mohapatra, J., Xing, M., & Liu, J. P. (2019). Inductive Thermal Effect of Ferrite Magnetic Nanoparticles. In *Materials* (Vol. 12, Nomor 19). <https://doi.org/10.3390/ma12193208>
- Mondal, D. K., Phukan, G., Paul, N., & Borah, J. P. (2021). Improved self heating and optical properties of bifunctional Fe<sub>3</sub>O<sub>4</sub>/ZnS nanocomposites for magnetic hyperthermia application. *Journal of Magnetism and Magnetic Materials*, *528*(December 2020), 167809. <https://doi.org/10.1016/j.jmmm.2021.167809>

- Morrison, C., Macnair, R., MacDonald, C., Wykman, A., Goldie, I., & Grant, M. H. (1995). In vitro biocompatibility testing of polymers for orthopaedic implants using cultured fibroblasts and osteoblasts. *Biomaterials*, *16*(13), 987–992. [https://doi.org/https://doi.org/10.1016/0142-9612\(95\)94906-2](https://doi.org/https://doi.org/10.1016/0142-9612(95)94906-2)
- Mørup, S., Hansen, M. F., & Frandsen, C. (2011). *1.14 - Magnetic Nanoparticles* (D. L. Andrews, G. D. Scholes, & G. P. B. T.-C. N. and T. Wiederrecht (Ed.); hal. 437–491). Academic Press. <https://doi.org/https://doi.org/10.1016/B978-0-12-374396-1.00036-2>
- Napier, M. E., & DeSimone, J. M. (2007). Nanoparticle drug delivery platform. *Polymer Reviews*, *47*(3), 321–327. <https://doi.org/10.1080/15583720701454999>
- Nemati, Z., Das, R., Alonso, J., Clements, E., Phan, M. H., & Srikanth, H. (2017). Iron Oxide Nanospheres and Nanocubes for Magnetic Hyperthermia Therapy: A Comparative Study. *Journal of Electronic Materials*, *46*(6), 3764–3769. <https://doi.org/10.1007/s11664-017-5347-6>
- Németh, Z., Csóka, I., Semnani Jazani, R., Sipos, B., Haspel, H., Kozma, G., Kónya, Z., & Dobó, D. G. (2022). Quality by Design-Driven Zeta Potential Optimisation Study of Liposomes with Charge Imparting Membrane Additives. *Pharmaceutics*, *14*(9). <https://doi.org/10.3390/pharmaceutics14091798>
- Newbury, D. E., & Ritchie, N. W. M. (2015). Performing elemental microanalysis with high accuracy and high precision by scanning electron microscopy/silicon drift detector energy-dispersive X-ray spectrometry (SEM/SDD-EDS). *Journal of Materials Science*, *50*(2), 493–518. <https://doi.org/10.1007/s10853-014-8685-2>
- Pal, N., Lee, J.-H., & Cho, E.-B. (2020). Recent Trends in Morphology-Controlled Synthesis and Application of Mesoporous Silica Nanoparticles. In *Nanomaterials* (Vol. 10, Nomor 11). <https://doi.org/10.3390/nano10112122>
- Pandey, P. C., & Singh, R. (2015). Controlled Synthesis of Functional Silver Nanoparticles Dispersible in Aqueous and Non-Aqueous Medium. *Journal of Nanoscience and Nanotechnology*, *15*(8), 5749–5759. <https://doi.org/10.1166/jnn.2015.10045>
- Panre, A. M., Yahya, I. M., Juharni, J., & Suharyadi, E. (2021). Magneto-optic surface plasmon resonance properties of core-shell Fe<sub>3</sub>O<sub>4</sub>@Ag nanoparticles. *Advances in Natural Sciences: Nanoscience and Nanotechnology*, *12*(4), 45011. <https://doi.org/10.1088/2043-6262/ac4996>
- Papadopoulos, C., Efthimiadou, E. K., Pissas, M., Fuentes, D., Boukos, N., Psycharis, V., Kordas, G., Loukopoulos, V. C., & Kagadis, G. C. (2020). Magnetic fluid hyperthermia simulations in evaluation of SAR calculation methods. *Physica Medica: European Journal of Medical Physics*, *71*, 39–52.

<https://doi.org/10.1016/j.ejmp.2020.02.011>

- Pate, K., & Safier, P. (2016). 12 - *Chemical metrology methods for CMP quality* (S. B. T.-A. in C. M. P. (CMP) Babu (Ed.); hal. 299–325). Woodhead Publishing. <https://doi.org/https://doi.org/10.1016/B978-0-08-100165-3.00012-7>
- Perumalsamy, H., Balusamy, S. R., Sukweenadhi, J., Nag, S., MubarakAli, D., El-Agamy Farh, M., Vijay, H., & Rahimi, S. (2024). A comprehensive review on Moringa oleifera nanoparticles: importance of polyphenols in nanoparticle synthesis, nanoparticle efficacy and their applications. *Journal of Nanobiotechnology*, 22(1), 71. <https://doi.org/10.1186/s12951-024-02332-8>
- Pieroni, L., Levi Mortera, S., Greco, V., Sirolli, V., Ronci, M., Felaco, P., Fucci, G., De Fulviis, S., Massoud, R., Condò, S., Capria, A., Di Daniele, N., Bernardini, S., Urbani, A., & Bonomini, M. (2015). Biocompatibility assessment of haemodialysis membrane materials by proteomic investigations. *Molecular BioSystems*, 11(6), 1633–1643. <https://doi.org/10.1039/c5mb00058k>
- Pope, C. G. (1997). X-Ray Diffraction and the Bragg Equation. *Journal of Chemical Education*, 74(1), 129. <https://doi.org/10.1021/ed074p129>
- Pradhan, P., Giri, J., Samanta, G., Sarma, H. D., Mishra, K. P., Bellare, J., Banerjee, R., & Bahadur, D. (2007). Comparative evaluation of heating ability and biocompatibility of different ferrite-based magnetic fluids for hyperthermia application. *Journal of Biomedical Materials Research. Part B, Applied Biomaterials*, 81(1), 12–22. <https://doi.org/10.1002/jbm.b.30630>
- Prasad, C., Sreenivasulu, K., Gangadhara, S., & Venkateswarlu, P. (2017). Bio inspired green synthesis of Ni/Fe<sub>3</sub>O<sub>4</sub> magnetic nanoparticles using Moringa oleifera leaves extract: A magnetically recoverable catalyst for organic dye degradation in aqueous solution. *Journal of Alloys and Compounds*, 700, 252–258. <https://doi.org/10.1016/j.jallcom.2016.12.363>
- Purwiandono, G., Fatimah, I., Sahroni, I., Citradewi, P. W., Kamari, A., Sagadevan, S., Oh, W.-C., & Doong, R. (2022). Fe<sub>3</sub>O<sub>4</sub>@SiO<sub>2</sub> nanoflakes synthesized using biogenic silica from Salacca zalacca leaf ash and the mechanistic insight into adsorption and photocatalytic wet peroxidation of dye. *Green Processing and Synthesis*, 11(1), 345–360. <https://doi.org/10.1515/gps-2022-0034>
- Quy, D. Van, Hieu, N. M., Tra, P. T., Nam, N. H., Hai, N. H., Thai Son, N., Nghia, P. T., Anh, N. T. Van, Hong, T. T., & Luong, N. H. (2013). Synthesis of Silica-Coated Magnetic Nanoparticles and Application in the Detection of Pathogenic Viruses. *Journal of Nanomaterials*, 2013, 603940. <https://doi.org/10.1155/2013/603940>
- Rafique, M. (2015). *Study of the Magnetoelectric Properties of Multiferroic Thin Films*

*and Composites for Device Applications.*  
<https://doi.org/10.13140/RG.2.2.23827.94245>

Rajan, A., & Sahu, N. K. (2020). Review on magnetic nanoparticle-mediated hyperthermia for cancer therapy. *Journal of Nanoparticle Research*, 22(11). <https://doi.org/10.1007/s11051-020-05045-9>

Rajan, A., Sharma, M., & Sahu, N. K. (2020). Assessing magnetic and inductive thermal properties of various surfactants functionalised Fe<sub>3</sub>O<sub>4</sub> nanoparticles for hyperthermia. *Scientific Reports*, 10(1), 1–15. <https://doi.org/10.1038/s41598-020-71703-6>

Ramesh, R., Geerthana, M., Prabhu, S., & Sohila, S. (2017). Synthesis and Characterization of the Superparamagnetic Fe<sub>3</sub>O<sub>4</sub>/Ag Nanocomposites. *Journal of Cluster Science*, 28(3), 963–969. <https://doi.org/10.1007/s10876-016-1093-9>

Ramesh, A. V., Rama Devi, D., Mohan Botsa, S., & Basavaiah, K. (2018). Facile green synthesis of Fe<sub>3</sub>O<sub>4</sub> nanoparticles using aqueous leaf extract of *Zanthoxylum armatum* DC. for efficient adsorption of methylene blue. *Journal of Asian Ceramic Societies*, 6(2), 145–155. <https://doi.org/10.1080/21870764.2018.1459335>

Rani, N. Z. A., Husain, K., & Kumolosasi, E. (2018). Moringa genus: A review of phytochemistry and pharmacology. *Frontiers in Pharmacology*, 9(FEB), 1–26. <https://doi.org/10.3389/fphar.2018.00108>

Ravariu, C., Mihaiescu, D. E., Morosan, A., Istrati, D., Purcareanu, B., Cristescu, R., Trusca, R., & Vasile, B. S. (2020). Solution for green organic thin film transistors: Fe<sub>3</sub>O<sub>4</sub> nano-core with PABA external shell as p-type film. *Journal of Materials Science: Materials in Electronics*, 31(4), 3063–3073. <https://doi.org/10.1007/s10854-019-02851-3>

Reyes-ortega, F., Delgado, Á. V., & Iglesias, G. R. (2021). Modulation of the magnetic hyperthermia response using different superparamagnetic iron oxide nanoparticle morphologies. *Nanomaterials*, 11(3), 1–14. <https://doi.org/10.3390/nano11030627>

Rosensweig, R. E. (2002). Heating magnetic fluid with alternating magnetic field. *Journal of Magnetism and Magnetic Materials*, 252, 370–374. [https://doi.org/https://doi.org/10.1016/S0304-8853\(02\)00706-0](https://doi.org/https://doi.org/10.1016/S0304-8853(02)00706-0)

Sanad, M. F., Meneses-Brassea, B. P., Blazer, D. S., Pourmiri, S., Hadjipanayis, G. C., & El-Gendy, A. A. (2021). Superparamagnetic fe/au nanoparticles and their feasibility for magnetic hyperthermia. *Applied Sciences (Switzerland)*, 11(14). <https://doi.org/10.3390/app11146637>

Seabra, A. B., Pelegrino, M. T., & Haddad, P. S. (2017). Chapter 24 - Antimicrobial

- Applications of Superparamagnetic Iron Oxide Nanoparticles: Perspectives and Challenges. In A. Ficai & A. M. B. T.-N. for A. T. Grumezescu (Ed.), *Micro and Nano Technologies* (hal. 531–550). Elsevier. <https://doi.org/https://doi.org/10.1016/B978-0-323-46152-8.00024-X>
- Singh, J., Dutta, T., Kim, K. H., Rawat, M., Samddar, P., & Kumar, P. (2018). “Green” synthesis of metals and their oxide nanoparticles: Applications for environmental remediation. *Journal of Nanobiotechnology*, 16(1), 1–24. <https://doi.org/10.1186/s12951-018-0408-4>
- Sirdeshpande, K. D., Sridhar, A., Cholkar, K. M., & Selvaraj, R. (2018). Structural characterization of mesoporous magnetite nanoparticles synthesized using the leaf extract of *Calliandra haematocephala* and their photocatalytic degradation of malachite green dye. *Applied Nanoscience (Switzerland)*, 8(4), 675–683. <https://doi.org/10.1007/s13204-018-0698-8>
- Some, S., Bulut, O., Biswas, K., Kumar, A., Roy, A., Sen, I. K., Mandal, A., Franco, O. L., İnce, İ. A., Neog, K., Das, S., Pradhan, S., Dutta, S., Bhattacharjya, D., Saha, S., Das Mohapatra, P. K., Bhuimali, A., Unni, B. G., Kati, A., ... Ocsoy, I. (2019). Effect of feed supplementation with biosynthesized silver nanoparticles using leaf extract of *Morus indica* L. V1 on *Bombyx mori* L. (Lepidoptera: Bombycidae). *Scientific Reports*, 9(1), 14839. <https://doi.org/10.1038/s41598-019-50906-6>
- Song, G., Wu, Y., Wang, F., Shao, Y., Jiang, J., Fan, C., Li, P., Zhang, Y., & Zuo, H. (2015). Development and preparation of a low-immunogenicity porcine dermal scaffold and its biocompatibility assessment. *Journal of Materials Science: Materials in Medicine*, 26(4), 170. <https://doi.org/10.1007/s10856-015-5503-6>
- Sukumaran, S., Neelakandan, M. S., Shaji, N., Prasad, P., & Yadunath, V. K. (2018). Magnetic Nanoparticles: Synthesis and Potential Biological Applications. *JSM Nanotechnol Nanomed*, 6(2), 1068.
- Taufiq, A., Saputro, R. E., Susanto, H., Hidayat, N., Sunaryono, S., Amrillah, T., Wijaya, H. W., Mufti, N., & Simanjuntak, F. M. (2020). Synthesis of Fe<sub>3</sub>O<sub>4</sub>/Ag nanohybrid ferrofluids and their applications as antimicrobial and antifibrotic agents. *Heliyon*, 6(12). <https://doi.org/10.1016/j.heliyon.2020.e05813>
- Teja, A. S., & Koh, P. Y. (2009). Synthesis, properties, and applications of magnetic iron oxide nanoparticles. *Progress in Crystal Growth and Characterization of Materials*, 55(1–2), 22–45. <https://doi.org/10.1016/j.pcrysgrow.2008.08.003>
- Tong, S., Zhu, H., & Bao, G. (2019). Magnetic iron oxide nanoparticles for disease detection and therapy. *Materials Today*, 31(December), 86–99. <https://doi.org/10.1016/j.mattod.2019.06.003>

- Tsopoe, S. P., Borgohain, C., Kar, M., Kumar Panda, S., & Borah, J. P. (2023). An exhaustive scrutiny to amplify the heating prospects by devising a core@shell nanostructure for constructive magnetic hyperthermia applications. *Scientific Reports*, 13(1), 13669. <https://doi.org/10.1038/s41598-023-39766-3>
- Upadhyay, S., Parekh, K., & Pandey, B. (2016). Influence of crystallite size on the magnetic properties of Fe<sub>3</sub>O<sub>4</sub> nanoparticles. *Journal of Alloys and Compounds*, 678, 478–485. <https://doi.org/10.1016/j.jallcom.2016.03.279>
- Vassallo, M., Martella, D., Barrera, G., Celegato, F., Coisson, M., Ferrero, R., Olivetti, E. S., Troia, A., Sözeri, H., Parmeggiani, C., Wiersma, D. S., Tiberto, P., & Manzin, A. (2023). Improvement of Hyperthermia Properties of Iron Oxide Nanoparticles by Surface Coating. *ACS Omega*, 8(2), 2143–2154. <https://doi.org/10.1021/acsomega.2c06244>
- Velasco, V., Muñoz, L., Mazarío, E., Menéndez, N., Herrasti, P., Hernando, A., & Crespo, P. (2015). Chemically synthesized Au–Fe<sub>3</sub>O<sub>4</sub> nanostructures with controlled optical and magnetic properties. *Journal of Physics D: Applied Physics*, 48(3), 35502. <https://doi.org/10.1088/0022-3727/48/3/035502>
- Wahyuni, S., Riswan, M., Adrianto, N., Dharmawan, M. Y., Tumbelaka, R. M., Cuana, R., Istiqomah, N. I., Jiananda, A., Garcia, S., & Suharyadi, E. (2023). Localized surface plasmon resonance properties dependence of green-synthesized Fe<sub>3</sub>O<sub>4</sub>/Ag composite nanoparticles on Ag concentration and an electric field for biosensor application. *Photonics and Nanostructures - Fundamentals and Applications*, 57, 101191. <https://doi.org/10.1016/j.photonics.2023.101191>
- Wang, L., Luo, J., Maye, M. M., Fan, Q., Rendeng, Q., Wang, J. Q., Engelhard, M. H., Wang, C., Lin, Y., Altman, E. I., & Zhong, C. J. (2004). Synthesis and characterization of magnetic iron oxide nanoparticles. *Materials Research Society Symposium Proceedings*, 853, 9–14. <https://doi.org/10.1557/proc-853-i4.12>
- Wang, R., Chen, C., Yang, W., Shi, S., Wang, C., & Chen, J. (2013). Enhancement effect of cytotoxicity response of silver nanoparticles combined with thermotherapy on C6 rat glioma cells. *Journal of Nanoscience and Nanotechnology*, 13(6), 3851–3854. <https://doi.org/10.1166/jnn.2013.7156>
- Wibowo, N. A., Harsojo, & Suharyadi, E. (2021). Prospect of core-shell Fe<sub>3</sub>O<sub>4</sub>@Ag label integrated with spin-valve giant magnetoresistance for future point-of-care biosensor. *Advances in Natural Sciences: Nanoscience and Nanotechnology*, 12(4), 45013. <https://doi.org/10.1088/2043-6262/ac498e>
- Yew, Y. P., Shameli, K., Miyake, M., Ahmad Khairudin, N. B. B., Mohamad, S. E. B., Naiki, T., & Lee, K. X. (2020). Green biosynthesis of superparamagnetic magnetite Fe<sub>3</sub>O<sub>4</sub> nanoparticles and biomedical applications in targeted anticancer drug delivery system: A review. *Arabian Journal of Chemistry*, 13(1), 2287–2308.

<https://doi.org/10.1016/j.arabjc.2018.04.013>

- Yew, Y. P., Shameli, K., Miyake, M., Kuwano, N., Bt Ahmad Khairudin, N. B., Bt Mohamad, S. E., & Lee, K. X. (2016). Green Synthesis of Magnetite ( $\text{Fe}_3\text{O}_4$ ) Nanoparticles Using Seaweed (*Kappaphycus alvarezii*) Extract. *Nanoscale Research Letters*, *11*(1). <https://doi.org/10.1186/s11671-016-1498-2>
- Yusefi, M., Shameli, K., Hedayatnasab, Z., Teow, S. Y., Ismail, U. N., Azlan, C. A., & Rasit Ali, R. (2021). Green synthesis of  $\text{Fe}_3\text{O}_4$  nanoparticles for hyperthermia, magnetic resonance imaging and 5-fluorouracil carrier in potential colorectal cancer treatment. *Research on Chemical Intermediates*, *47*(5), 1789–1808. <https://doi.org/10.1007/s11164-020-04388-1>
- Yusefi, M., Shameli, K., Yee, O. S., Teow, S. Y., Hedayatnasab, Z., Jahangirian, H., Webster, T. J., & Kuča, K. (2021). Green synthesis of  $\text{Fe}_3\text{O}_4$  nanoparticles stabilized by a garcinia mangostana fruit peel extract for hyperthermia and anticancer activities. *International Journal of Nanomedicine*, *16*, 2515–2532. <https://doi.org/10.2147/IJN.S284134>
- Zahedi-Tabar, Z., Bagheri-Khoulenjani, S., Amanpour, S., & Mirzadeh, H. (2019). A Review on the Application of In Vitro and In Vivo Models of Cancerous Tumors for the Study of the Hyperthermia Effect. *Basic & Clinical Cancer Research*, *11*(1 SE-Mini-Reviews). <https://doi.org/10.18502/bccr.v11i1.1653>
- Zeinoun, M., Serrano, D., Medina, P. T., García, Ó., Vasić, M., & Serrano-Olmedo, J. J. (2021). Configurable High-Frequency Alternating Magnetic Field Generator for Nanomedical Magnetic Hyperthermia Applications. *IEEE Access*, *9*, 105805–105816. <https://doi.org/10.1109/ACCESS.2021.3099428>
- Zhu, M., Lerum, M. Z., & Chen, W. (2012). How To Prepare Reproducible, Homogeneous, and Hydrolytically Stable Aminosilane-Derived Layers on Silica. *Langmuir*, *28*(1), 416–423. <https://doi.org/10.1021/la203638g>
- Zhuang, L., Zhang, W., Zhao, Y., Shen, H., Lin, H., & Liang, J. (2015). Preparation and Characterization of  $\text{Fe}_3\text{O}_4$  Particles with Novel Nanosheets Morphology and Magnetochromatic Property by a Modified Solvothermal Method. *Scientific Reports*, *5*(1), 9320. <https://doi.org/10.1038/srep09320>