



REFERENCES

REFERENCES

- [1] Frank, S.D. and Amelio, Sr. (1999). **Botanical, a phyto cosmetic desk reference**. New York: CRC.
- [2] Lin, Y.H., Yang, Y.H. and Wu, S.M. (2007). Experimental design and capillary electrophoresis for simultaneous analysis of arbutin, kojic acid and hydroquinone in cosmetics. **Journal of Pharmaceutical and Biomedical Analysis**, 44, 279-282.
- [3] Donsing, P., Limpeanchob, N. and Viyoch, J. (2008). Effect of Thai breadfruits heartwood extract on melanogenesis-inhibitory and antioxidation activities. **Journal Cosmetic Science**, 59, 41-85.
- [4] Shimizu, K., Kondo, R., Sakai, K., Lee, S.H. and Sato, H. (1998). The inhibitory components from *Artocarpus incisus* on melanin biosynthesis. **Planta Medica**, 64(5), 408-412.
- [5] Shimizu, K., Kondo, R. and Sakai, K. (2002). The skin-lightening effects of artocarpin on UVB-induced pigmentation. **Planta Medica**, 68(1), 79-81.
- [6] Hyun, S.K., Lee, W.H., Jeong, D.M., Kim, Y. and Choi, J.S. (2008). Inhibitory Effects of kurarinol, kuraridinol, and trifolirhizin from *Sophora flavescens* on tyrosinase and melanin synthesis. **Biological & Pharmaceutical Bulletin**, 31(1), 154-158.
- [7] Ichihashi, M. (July 8, 2001). Annual scientific meeting 2001 recent advance in melanogenesis. **Hong Kong Journal of Dermatology and Venereology**, 19(4), 187.
- [8] Shafiq-un-Nabi, S., Shakeel, F., Talegaonkar, S., Ali, J., Baboota, S., Ahuja, A. et al. (April 6, 2007). Formulation development and optimization using nanoemulsion techniquea technical note. **AAPS PharmSciTech**, 8 (2), E1-E6. Retrieved December 12, 2007, from <http://www.aapspharmscitech.org>.
- [9] Engels, T., Forster, T. and von Rybinski, W. (1995). The influence of coemulsifier type on the stability of oil-in-water emulsions. **Colloids and Surfaces A: Physicochemical and Engineering Aspects**, 99, 141-149.

- [10] World Agroforestry Centre. (February, 2008). **A Tree Species Reference and Selection Guide**. Retrieved February 15, 2008, from <http://www.worldagroforestry.org/SEA/Products/AFDbases/AF/asp/SpeciesInfo.asp?SpID=1734>.
- [11] DestinationTropicals. (September 17, 2006). **Tropical Plant Breadfruit** *Artocarpus altilis*. Retrieved January 24, 2008, from http://www.destinationtropicals.com/tropical_plants/plant_13.asp.
- [12] Adebowale, K.O., Olu-Owolabi, B.I., Olawumi, E.K. and Lawal, O.S. (2005). Functional properties of native, physically and chemically modified breadfruit (*Artocarpus altilis*) starch. **Industrial Crops and Products**, 21(3), 343-351.
- [13] Amusa, N.A., Kehinde, I. and Ashaye, O. (2002). Bio-deterioration of breadfruit (*Artocarpus communis*) in storage and its effects on the nutrient composition. **African Journal of Biotechnology**, 1(2), 57-60.
- [14] Schrader, K. and Domsch, A. (Eds.). (2005). **Cosmetology-Theory and Practice**. Germany: Kessler Druck.
- [15] Ponec, M. (2002). Skin constructs for replacement skin tissue for *in vitro* testing. **Advanced Drug Delivery**, 54 (1), 19-30.
- [16] Schuller, R. and Romanowski, P. (1999). **Conditioning Agents for Hair and Skin**. London: Marcel Dekker.
- [17] Simmons, J.V. (1995). **Science and the beauty business** (2nd ed.). London: Macmillan.
- [18] Cevc, G. (2004). Lipid vesicles and other colloids as drug carriers on the skin. **Advanced Drug Delivery**, 56(5), 675-711.
- [19] Walters, K.A (Ed). (2002). **The structure and function of skin**. New York: Marcel Dekker.
- [20] Brain W. B. (1983). Dermatological Formulation (Percutaneous Absorption). **In Drug and the Pharmaceutical Sciences**, 18, 300-304.
- [21] Ventre, M., Mollica, R.F. and Netti, P.A. (2009). The effect of composition and microstructure on the viscoelastic properties of dermis. **Journal of Biomechanics**, 42, 430-435.

- [22] Freedberg, I.M. and Fitzpatrick, T.B. (Eds). (1993). **Biology of melanocytes**. New York: MacGraw-Hill.
- [23] Bologna, J.L. and Orlow, S.J. (November 6, 1999). **Melanocyte Biology**. Retrieved July 14, 2007, from <http://www3.us.elsevierhealth.com/HS/promo/Bologna/Ch65.pdf>.
- [24] Sanchez-Ferrer, A., Rodriguez-Lopez, J.N., Garcia-Canovas, F. and Garcia-Carmona, F. (1995). Tyrosinase: a comprehensive review of its mechanism. **Biochemical et Biophysica Acta**, 1247, 1-11.
- [25] Goding, C.R. (2007). Melanocytes: The new black. **The International Journal of Biochemistry and Cell Biology**, 39, 275-279.
- [26] Hearing, V.J. (2005). Biogenesis of pigment granules sensitive way to regulate melanocyte function. **Journal of Dermatological Science**, 37, 3-14.
- [27] Sturm, R.A. (1998). Human pigmentation genes and their response to solar UV radiation. **Mutation Research**, 422, 69-76.
- [28] Prota, G. (1992). **Melanins and melanogenesis**. New York: Academic.
- [29] Gallagher, R.P. and Lee, T.K. (2006). Adverse effects of ultraviolet radiation A brief review. **Progress in Biophysics and Molecular Biology**, 92, 119-131.
- [30] Agar, N. and Young, A.R. (2005). Melanogenesis: a photoprotective response to DNA damage?. **Mutation Research/Fundamental and Molecular Mechanisms of Mutagenesis**, 571(1-2), 121-132.
- [31] Shimizu, K., Kondo, R., Sakai, K., Takeda, N., Nagahata, T. and Oniki, T. (2001). Novel vitamin E derivative with 4-substituted resorcinol moiety has both antioxidant and tyrosinase inhibitory properties. **Lipids**, 36, 1321-1326.
- [32] Matsumura, Y. and Ananthaswamy, H.N. (2004). Toxic effects of ultraviolet radiation on the skin. **Toxicology and Applied Pharmacology**, 195, 298-308.
- [33] Taylor, S. and Woolery-Lloyd, H. (2008). Pigmentation disorders in skin of color: the role of natural substances. **Seminars in Cutaneous Medicine and Surgery**, 27(3), 14-15.

- [34] Jacques, S.L. and McAuliffe, D.J. (1991). The melanosome threshold temperature for explosive vaporization and internal absorption coefficient during pulsed laser irradiation. **Journal of Photochemistry and Photobiology B**, 53, 769-775.
- [35] Patrick, E., Juberg, D.R., Donoghue, J. and Maibach, H.I. (1999). Depigmentation with *tert*-Butyl Hydroquinone using black guinea pigs. **Food and Chemical Toxicology**, 37(2-3), 169-175.
- [36] Katsambas, A.D. and Stratigos, A.J. (2001). Depigmenting and bleaching agent coping with hyperpigmentation. **Clinics in Dermatology**, 19, 483-488.
- [37] Solano, F., Briganti, S., Picardo, M. and Ghanem, G. (2006). Hypopigmentating agents: an updated review on biological, chemical and clinical aspects. **Pigment Cell Research**, 19, 550-571.
- [38] Gupta, A.K., Gover, M.D., Nouri, K. and Taylor S. (2006). The treatment of melasma: A review of clinical trials. **Journal of the American Academy of Dermatology**, 55(6), 1048-1065.
- [39] Curto, E.V., Kwong, C., Hermersdorfer, H., Glatt, H., Santis, C., Virador, V., et al. (1999). Inhibitors of mammalian melanocytes tyrosinase: *in vitro* comparisons of alkyl esters of gentisic acid and other putative inhibitors. **Biochemical Pharmacology**, 57(6), 663-672.
- [40] Draelos, Z.D. (2008). The cosmeceutical realm. **Clinics in Dermatology**, 26, 627-632.
- [41] Sugimoto, K., Nomura, K., Nishimura, T., Kiso, T., Sugimoto, K. and Kuriki, T. (2005). Syntheses of α -arbutin- α -glycosides and their inhibitory effects on human tyrosinase. **Journal of Bioscience and Bioengineering**, 99(3), 272-276.
- [42] Nohynek, G.J., Kirkland, D., Marzin, D., Toutain, H., Leclerc-Ribaud, C. and Jinnai, H. (2004). An assessment of the genotoxicity and human health risk of topical use of kojic acid [5-hydroxy-2-(hydroxymethyl)-4H-pyran-4-one]. **Food and Chemical Toxicology**, 42(1), 93-105.

- [43] Takizawa, T., Mitsumori, K., Tamura, T., Nasa, M., Ureda, M., Imai, T., et al. (2003). Hepatocellular tumor induction in heterozygous p53-deficient CBA mice by a 26-week dietary administration of kojic acid. **Journal of Toxicological Sciences**, 73, 287-293.
- [44] Likhitwitayawuid, K., Sornsute, A., Sritularak, B. and Ploypradith, P. (2006). Chemical transformations of oxyresveratrol (*trans*-2,4,3',5'-tetrahydroxystilbene) into a potent tyrosinase inhibitor and a strong cytotoxic agent. **Bioorganic & Medicinal Chemistry Letters**, 16 (21), 5650-5653.
- [45] Jung, G.D., Yang, J.Y., Song, E.S. and Park, J.W. (2001). Stimulation of melanogenesis by glycyrrhizin in B16 melanoma cells. **Experimental and Molecular Medicine**, 33(3), 131-135.
- [46] Elsner, P. and Maibach H.I. (Eds). (2002). **Depigmentation agents**. New York: Marcel Dekker.
- [47] Conforti, F., Sosa, S., Marrelli, M., Menichini, F., Statti, G.A., Uzunov, D., et al. (2009). The protective ability of Mediterranean dietary plants against the oxidative damage: The role of radical oxygen species in inflammation and the polyphenol, flavonoid and sterol contents. **Food Chemistry**, 112, 587-594.
- [48] Amarowicz, R., Pegg, R.B., Rahimi-Moghaddam, P., Barl, B. and Weil, J.A. (2004). Free-radical scavenging capacity and antioxidant activity of selected plant species from the Canadian prairies. **Food Chemistry**, 85(4), 551-562.
- [49] Wang, K.H., Lin, R.D., Hsu, F.L., Huang, Y.H. Chang, H.C., Huang, C.Y., et al. (2006). Cosmetic applications of selected traditional Chinese herbal medicines. **Journal of Ethnopharmacology**, 106, 353-359.
- [50] Juliano, C., Cossu, C., Alamanni, M.C., and Piu, L. (2005). Antioxidant activity of gamma-oryzanol: mechanism of action and its effect on oxidative stability of pharmaceutical oils. **International Journal of Pharmaceutics**, 29(1-2), 146-154.
- [51] Loset, J.R., Marston, A., Gupta, M.P. and Hostettmann, K. (2001). A methylflavan with free radical scavenging properties from *Pancratium littorale*. **Fitoterapia**, 72(1), 35-39.

- [52] Rangkadilok, N., Sitthimonchai, S., Worasuttayangkurn, L., Mahidol, C., Ruchirawat, M. and Satayavivad, J. (2007). Evaluation of free radical scavenging and antityrosinase activities of standardized longan fruit extract. **Food and Chemical Toxicology**, 45(2), 328-336.
- [53] Kubo, I., Nihei, K. and Tsujimoto, K. (2004). Methyl p- coumarate, a melanin formation inhibitor in B16 mouse melanoma cells. **Bioorganic and Medicinal Chemistry**, 12(20), 5349-5354.
- [54] Skerget, M., Kotnik, P., Hodolin, M., Hras, A.R., Simonic, M. and Knez, Z. (2005). Phenols, proanthocyanidins, flavones and flavonoids in some plant materials and their antioxidant activities. **Food Chemistry**, 89(2), 191-198.
- [55] Khatib, S., Khatib, S., Nerya, O., Musa, R., Shmuel, M., Tamir, S., et al. (2005). Chalcones as potent tyrosinase inhibitors: the importance of a 2, 4-substitute resorcinol moiety. **Bioorganic and Medicinal Chemistry**, 13 (2), 433-441.
- [56] Zhang, Z., Liao, L., Moore, J., Wu, T. and Wang, Z. (2009). Antioxidant phenolic compounds from walnut kernels. **Food Chemistry**, 113, 160-165.
- [57] Prior, R.L., Wu, X.L. and Schaich, K. (2005). Standardized methods for the determination of antioxidant capacity and phenolics in foods and dietary supplements. **Journal of Agricultural and Food Chemistry**, 53, 4290-4302.
- [58] Roginsky, V. and Lissi, E.A. (2005). Review of methods to determine chain-breaking antioxidant activity in food. **Food Chemistry**, 92(2), 235-254.
- [59] Mambro, V.M. and Fonseca, M.J.V. (2005). Assays of physical stability and antioxidant activity of a topical formulation added with different plant extracts. **Journal of Pharmaceutical and Biomedical Analysis**, 37(2), 287-295.
- [60] Molyneux, P. (2004). The use of the stable free radical diphenylpicrylhydrazyl (DPPH) for estimating antioxidant activity. **Songklanakarin Journal of Science and Technology**, 26(2), 211-219.
- [61] Grimes, P.E. (2009). Management of hyperpigmentation in darker racial ethnic groups. **Seminars in Cutaneous Medicine and Surgery**, 28(2), 77-85.

- [62] Szekanecz, Z. and Koch, A.E. (2004). Therapeutic inhibition of leukocyte recruitment in inflammatory diseases. **Current Opinion in Pharmacology**, 4(4), 423-428.
- [63] Laupattarakasem, P., Wangsrimongkol, T., Surarit, R. and Hahnvajanawong, C. (2006). *In vitro* and *in vivo* anti-inflammatory potential of *Cryptolepis buchanani*. **Journal of Ethnopharmacology**, 108(3), 349-354.
- [64] Michaud, J., Kohno, M., Proia, R.L. and Hla, T. (2006). Normal acute and chronic inflammatory responses in sphingosine kinase1 knockout mice. **FEBS Letters**, 580(19), 4607-46012.
- [65] Ee, S.L., Duan, X., Liew, J. and Nguyen, D. (2008). Droplet size and stability nano-emulsions produced by the temperature phase inversion method. **Chemical Engineering Journal**, 140, 626-631.
- [66] Yilmaz, E. and Borchert, H.H. (2006). Effect of lipid-containing, positively charged nanoemulsions on skin hydration, elasticity and erythema-An *in vivo* study. **International Journal of Pharmaceutics**, 307(2), 232-238.
- [67] Spornath, L., Regev, O., Levi-Kalisman, Y. and Magdassi, S. (2009). Phase transitions in o/w lauryl acrylate emulsions during phase inversion, studied by light microscopy and cryo-TEM. **Physicochemical and Engineering Aspects**, 332, 19-35.
- [68] Wang, L., Li, X., Zhang, G., Dong, J. and Eastoe, J. (2007). Oil-in-water nanoemulsions for pesticide formulations. **Journal of Colloid and Interface Science**, 314, 230-235.
- [69] Shinoda, K. and Satio, H. (1968). The effect of temperature on the phase equilibria and the types of dispersions of water, cyclohexane, and nonionic surfactant. **Journal of Colloid and Interface Science**, 26(1), 70-74.
- [70] Morganti, P., Ruocco, E., Wolf, R. and Ruocco, V. (2001). Percutaneous absorption and delivery systems. **Clinics in Dermatology**, 19(4), 489-501.
- [71] Sheihet, L., Chandra, P., Batheja, P., Devore, D., Kohn, J. and Michniak, B. (2008). Tyrosine-derived nanospheres for enhanced topical skin penetration. **International Journal of Pharmaceutics**, 350, 312-319.

- [72] Goldberg-Cettina, M. and Liu, P. (1995). Enhanced transdermal delivery of estradiol *in vitro* using binary vehicles of isopropyl myristate and short-chain alkanols. **International Journal of Pharmaceutics**, 114(2), 237-245.
- [73] Kanikkannan, N., Singh, J. and Ramarao, P. (2001). *In vitro* transdermal iontophoretic transport of timolol maleate: effect of age and species. **Journal of Controlled Release**, 71(1), 99-105.
- [74] Dureja, H., Tiwary, A.K. and Gupta, S. (2001). Simulation of skin permeability in chitosan membranes. **International Journal of Pharmaceutics**, 213(1-2), 193-198.
- [75] Petit, L., Fogouang, L., Uhoda, I., Smitz, S., Pierard-Franchimont, C., and Pierard, G.E. (2003). Regional variability in mottled subclinical melanoderma in the elderly. **Journal of Experimental Gerontology**, 38(4), 327-331.
- [76] Mun, Y.J., Lee, S.W., Jeong, H.W., Lee, K.G., Kim, J.H. and Woo, W.H. (2004). Inhibitory effect of miconazole on melanogenesis. **Biological and Pharmaceutical Bulletin**, 27(6), 806-809.
- [77] Cho, J.Y., Baik, K.U., Jung, J.H. and Park, M.H. (2000). *In vitro* anti-inflammatory effects of cynaropicrin, a sesquiterpene lactone, from *Saussurea lappa*. **European Journal of Pharmacology**, 398, 399-404.
- [78] Pae, H.O., Oh, G.S., Choi, B.M., Shin, S., Chai, K.Y., Oh, H., et al. (2003). Inhibitory effect of the stem bark of *Catalpa ovate* G. Don. (Bignoniaceae) on the production of tumor necrosis factor and nitric oxide by the lipopolisaccharide RAW264.7 macrophages. **Journal of Ethnopharmacology**, 88, 287-291.
- [79] Shafiq, S., Shakeel, F., Talegoankar, S., Ahmad, F.J., Khar, R.K. and Ali, M. (2007). Development and bioavailability assessment of ramipril nanoemulsion formulation. **European Journal of Pharmaceutics and Biopharmaceutics**, 66, 227-243.
- [80] Badkar, A., Talluri, K., Tenjaria, S., Jaynes, J. and Banga, A.K. (2000). *In vitro* release testing peptide gel. **Pharmaceutical technology**, 22, 44-51.

- [81] Proniuk, S., Dixon, S.E. and Blanchard, J. (2001). Investigation of the utility of an *in vitro* release test for optimizing semisolid dosage forms. **Pharmaceutical Development and Technology**, 6, 469-476.
- [82] Ando, H., Ryu, A., Hashimoto, A., Oka, M. and Ichihashi, M. (1998). Linoleic acid and alpha-linolenic acid lighten ultraviolet-induced hyperpigmentation of the skin. **Archives of Dermatological Research**, 290, 375-381.
- [83] Hanamura, T., Uchida, E., and Aoki, H. (2008). Skin-lightening effect of a polyphenol extract from acerola (*Malpighia emarginata* DC.) fruit on UV-induced pigmentation. **Bioscience, Biotechnology, and Biochemistry**, 72(12), 3211-3218.
- [84] Choi, S.Y., Kim, S., Kim, H., Suk, K., Hwang, J.S., Lee, B.G., et al. (2002). (4-methoxy-benzylidene)-(3-methoxy-phenyl)-amine, a nitrogen analog of stilbene as a potent inhibitor of melanin production. **Chemical and Pharmaceutical Bulletin**, 5(4), 450-452.
- [85] Lee, S.H., Choi, S.Y., Kim, H., Hwang, J.S., Lee, B.G., Gao, J.J., et al. (2002). Mulberroside F isolated from the leaves of *Morus alba* inhibits melanin biosynthesis. **Biological and Pharmaceutical Bulletin**, 25(8), 1045-1408.
- [86] Curto, E.V., Kwong, C., Hermersdorfer, H., Glatt, H., Santis, C., Virador, V., et al. (1999). Inhibitor of mammalian melanocyte tyrosinase: *in vitro* comparisons of alkyl esters of gentisic acid with others putative inhibitors. **Biochemical Pharmacology**, 57(6), 663-672.
- [87] Kim, D.H., Hwang, J.S., Baek, H.S., Kim, K.L., Lee, B.G., Chang, I., et al. (2003). Development of 5-[(3-aminopropyl) phosphinoxy]-2-(hydroxylmethyl)-4H-pyran-4-one as a novel whitening agent. **Chemical Pharmaceutical Bulletin**, 51(2), 113-116.
- [88] Karakaya, S. (2004). Bioavailability of phenolic and antioxidant properties of gallic acid. **Biological and Pharmaceutical Bulletin**, 44, 453-464.
- [89] Wu, L.C., Chang, L.H., Chen, S.H. Fan, N.C. and Annie Ho, J.A. (2009). Antioxidant activity and melanogenesis inhibitory effect of the acetonic extract of *Osmanthus fragrans*: A potential natural and functional food flavor additive. **LWT - Food Science and Technology**, 42(9), 1513-1519.

- [90] No, J.K., Kim, Y.J., Lee, J.S. and Chung, H.Y. (2006). Inhibition of melanogenic activity by 4, 4-dihydroxybiphenyl in melanoma cells. **Biological and Pharmaceutical Bulletin**, 29, 14-16.
- [91] Kim, Y.J. (2007). Anti-melanogenic and Anti-oxidant properties of galic acid. **Biological and Pharmaceutical Bulletin**, 30, 1052-1055.
- [92] Seo, S.Y., Sharma, V.K. and Sharma N. (2003). Mushroom tyrosinase recent prospects. **Journal of Agricultural and Food Chemistry**, 51, 2837-2853.
- [93] Karg, E., Odh, G., Wittbjer, A., Rosengren, E. and Rorsman, H. (1993). Hydrogen peroxide as an inducer of elevated tyrosinase level in melanoma cells. **Journal of Investigative Dermatology**, 100, 209S-213S.
- [94] Tsai, C.C., Lin, M.T., Wang J.J., Liao, J.F. and Huang, W.T. (2006). The antipyretic effects of baicalin in lipopolysaccharide-evoked fever in rabbits. **Neuropharmacology**, 51(4), 709-717.
- [95] Ullrich, S.E. (2002). Photoimmunesuppression and photocarcinogenesis. **Frontiers in Bioscience**, 7, D684-D703.
- [96] Tadros, T.F., Izquierdo, P., Esquena, J. and Solans, C. (2004). Formation and stability of nanoemulsions. **Advances in Colloid and Interface Science**, 108, 303-318.
- [97] Yu, C.C., Lee, Y.S., Cheon, B.S. and Lee, S.H. (2003). Synthesis of glycerol monostearate with high purity. **Journal of the Korean Chemical Society**, 24, 1229-1231.
- [98] Friberg, S.E. and El-Nokaly, M.A. (1985). **Surfactants in Cosmetics**. New York: Marcel Dekker.
- [99] Forster, T., Schambil, F. and von Rybinskin, W. (1992). Production of fine disperse and long-term stable oil-in-water emulsions by the phase inversion temperature method. **Journal of Dispersion Science and Technology**, 13, 183-193.
- [100] Hsieh, D.S. (1994). **Drug permeation enhancement theory and application**. New York: Marcel Dekker.
- [101] Thacrodí, D. and Panduranga, R.K. (1994). Transdermal absorption of nifedipine from microemulsions of lipophilic skin penetration enhancers. **Journal of Pharmaceutics**, 111, 235-240.

- [102] Müller-Goymann, C.C. (2004). Physicochemical characterization of colloidal drug delivery systems such as reverse micelles, vesicles, liquid crystals and nanoparticles for topical administration. **European Journal of Pharmaceutics and Biopharmaceutics**, 58(2), 343-356.
- [103] Shimizu, K., Kondo, R. and Sakai, K. (2001). Inhibition of tyrosinase by flavonoids, stilbenes and related 4-substituted resorcinols: structure-activity investigations. **Planta Medica**, 66, 11-15.
- [104] Chedekel, M.R. and Zeise, L. (1988). Sunlight, melanogenesis and radicals in the skin. **Lipids**, 23, 587-591.
- [105] Aoki, Y., Tanigawa, T., Abe, H. and Fujiwara, Y. (2007). Melanogenesis inhibition by and Oolong tea extract in B16 mouse melanoma cells and UV-induced skin pigmentation in brownish guinea pigs. **Bioscience, Biotechnology and Biochemistry**, 71(8), 1879-1885.
- [106] Quevedo Jr, W.C., Holstein, T.J., Dyckman, J., McDonald, C.J. and Isaacson, E.L. (2000). Inhibition of UVR-induced tanning and immunosuppression by topical applications of vitamins C and E to the skin of hairless (hr/hr) mice. **Pigment Cell Research**, 13, 89-98.