



8. References

- Baldi P, Long AD (2001) A Bayesian framework for the analysis of microarray expression data: regularized t-test and statistical inferences of gene changes. *Bioinformatics* 17:509-519.
- Bardagi M, Vala H, Fondevila D, Ferrer L (2007) Immunohistochemical detection of filaggrin in the skin of different species. *Vet Dermatol* 18:388.
- Barros Roque J, O'Leary CA, Kyaw-Tanner M, et al (2009) Haplotype sharing excludes canine orthologous Filaggrin locus in atopy in West Highland White Terriers. *Anim Genet* 40:793-794.
- Bovenschen HJ, Seyger MM, Van de Kerkhof PC (2005) Plaque psoriasis vs. atopic dermatitis and lichen planus: a comparison for lesional T-cell subsets, epidermal proliferation and differentiation. *Br J Dermatol* 153:72-78.
- Brinkhof B, Spee B, Rothuizen J, Penning LC (2006) Development and evaluation of canine reference genes for accurate quantification of gene expression. *Anal Biochem* 356:36-43.
- Candi E, Schmidt R, Melino G (2005) The cornified envelope: a model of cell death in the skin. *Nat Rev Mol Cell Biol* 6:328-340.
- Chavanas S, Bodemer C, Rochat A, et al (2000) Mutations in SPINK5, encoding a serine protease inhibitor, cause Netherton syndrome. *Nat Genet* 25:141-142.

- Chervet L, Galichet A, McLean WH, et al (2010) Missing C-terminal filaggrin expression, NFkappaB activation and hyperproliferation identify the dog as a putative model to study epidermal dysfunction in atopic dermatitis. *Exp Dermatol* 19:e343-e346.
- Choi GH, Wahid F, Kim YY (2010) The effect of a phytosphingosine-like substance isolated from *Asterina pectinifera* on involucrin expression in mite antigen-stimulated HaCaT cells. *Nat Prod Commun* 5:1081-1084.
- Cline PR, Rice RH (1983) Modulation of involucrin and envelope competence in human keratinocytes by hydrocortisone, retinyl acetate, and growth arrest. *Cancer Res* 43:3203-3207.
- Crick F HC (1970) Central dogma of molecular biology. *Nature* 227: 561-563.
- de Mora F, de la Fuente C, Jasmin P, et al (2007) Evaluation of the expression of P-selectin, ICAM-1, and TNF-alpha in bacteria-free lesional skin of atopic dogs with low-to-mild inflammation. *Vet Immunol Immunopathol* 115:223-229.
- DeBoer DJ, Hillier A (2001) The ACVD task force on canine atopic dermatitis (XVI): laboratory evaluation of dogs with atopic dermatitis with serum-based "allergy" tests. *Vet Immunol Immunopathol* 81:277-287.
- Descargues P, Deraison C, Bonnart C, et al (2005) Spink5-deficient mice mimic Netherton syndrome through degradation of desmoglein 1 by epidermal protease hyperactivity. *Nat Genet* 37:56-65.

- Ekanayake-Mudiyanselage S, Aschauer H, Schmook FP, et al (1998) Expression of epidermal keratins and the cornified envelope protein involucrin is influenced by permeability barrier disruption. *J Invest Dermatol* 111:517–523.
- Engelke M, Jensen JM, Ekanayake-Mudiyanselage S, Proksch E (1997) Effects of xerosis and ageing on epidermal proliferation and differentiation. *Br J Dermatol* 137:219-225.
- Favrot C, Steffan J, Seewald W, Picco F (2010) A prospective study on the clinical features of chronic canine atopic dermatitis and its diagnosis. *Vet Dermatol* 21:23-31.
- Fournier ML, Paulson A, Pavelka N, Mosley AL, Gaudenz K, Bradford WD, Glynn E, Li H, Sardu ME, Fleharty B, Seidel C, Florens L, Washburn MP (2010) Delayed correlation of mRNA and protein expression in rapamycin-treated cells and a role for Ggc1 in cellular sensitivity to rapamycin. *Mol Cell Proteomics* 9:271-284.
- Fraser MA, McNeil PE, Girling SJ (2008) Prediction of future development of canine atopic dermatitis based on examination of clinical history. *J Small Anim Pract* 49:128-132.
- Fuchs E, Green H (1980) Changes in keratin gene expression during terminal differentiation of the keratinocyte. *Cell* 19:1033–1042.
- Fuchs E (1990) Epidermal differentiation: the bare essentials. *J Cell Biol.* 111:2807-2814.
- Glickman MH, Ciechanover A (2002) The ubiquitin-proteasome proteolytic pathway: destruction for the sake of construction. *Physiol Rev* 82:373-428.
- Grether-Beck S, Mühlberg K, Brenden H, et al (2008) Bioactive molecules from the Blue Lagoon: in vitro and in vivo assessment of silica mud and microalgae extracts for

- their effects on skin barrier function and prevention of skin ageing. *Exp Dermatol* 17:771-779.
- Griffin CE, DeBoer DJ (2001) The ACVD task force on canine atopic dermatitis (XIV): clinical manifestations of canine atopic dermatitis. *Vet Immunol Immunopathol* 81:255-269.
- Halliwell R (2006) Revised nomenclature for veterinary allergy. *Vet Immunol Immunopathol* 114:2007-2008.
- Hightower K, Marsella R, Creary E, Dutcher P (2008) Evaluation of transepidermal water loss in canine atopic dermatitis: a pilot study in Beagle dogs sensitized to house dust mites. *The 23rd Proceedings of the North American Veterinary Dermatology Forum*, 183.
- Hill PB, Hillier A, Olivry T (2001) The ACVD task force on canine atopic dermatitis (VI): IgE-induced immediate and late-phase reactions, two inflammatory sequences at sites of intradermal allergen injections. *Vet Immunol Immunopathol* 81:199-204.
- Hillier A, DeBoer DJ (2001). The ACVD task force on canine atopic dermatitis (XVII): intradermal testing. *Vet Immunol Immunopathol* 81:289-304.
- Hillier A, Griffin CE (2001) The ACVD task force on canine atopic dermatitis (I): incidence and prevalence. *Vet Immunol Immunopathol* 81:147-151.
- Hitomi K (2005) Transglutaminases in skin epidermis. *Eur J Dermatol* 15:313-319.
- Hohl D (1993) Expression patterns of loricrin in dermatological disorders. *Am J Dermatopathol* 15:20-27.

- Hong SP, Kim MJ, Jung MY, Jeon H, et al (2008a) Biopositive effects of low-dose UVB on epidermis: coordinate upregulation of antimicrobial peptides and permeability barrier reinforcement. *J Invest Dermatol* 128:2880-2887.
- Hong JH, Youm JK, Kwon MJ, et al (2008b) K6PC-5, a direct activator of sphingosine kinase 1, promotes epidermal differentiation through intracellular Ca^{2+} signaling. *J Invest Dermatol* 128:2166-2178.
- Hudson TJ (2006) Skin barrier function and allergic risk. *Nature Genetics* 38: 399–400.
- Inman AO, Olivry T, Dunston SM, Monteiro-Riviere NA, Gatto H (2001) Electron microscopic observations of stratum corneum intercellular lipids in normal and atopic dogs. *Vet Pathol* 38:720–723.
- Jarzab J, Filipowska B, Zebracka J, et al (2010) Locus 1q21 gene expression changes in atopic dermatitis skin lesions: deregulation of small proline-rich region 1A. *Int Arch Allergy Immunol* 151:28-37.
- Jensen JM, Folster-Holst R, Baranowsky A, et al (2004) Impaired sphingomyelinase activity and epidermal differentiation in atopic dermatitis. *J Invest Dermatol* 122:1423–1431.
- Jensen JM, Schütze S, Neumann C, Proksch E (2000) Impaired cutaneous permeability barrier function, skin hydration, and sphingomyelinase activity in keratin 10 deficient mice. *J Invest Dermatol* 115:708-713.
- Kanitakis J (2002) Anatomy, histology and immunohistochemistry of normal human skin. *Eur J Dermatol* 12:390-401.

- Kato A, Fukai K, Oiso N, et al (2003) Association of SPINK5 gene polymorphisms with atopic dermatitis in the Japanese population. *Br J Dermatol* 148:665-669.
- Kawahira K (1999) Immunohistochemical staining of proliferating cell nuclear antigen (PCNA) in malignant and nonmalignant skin diseases. *Arch Dermatol Res* 291:413-418.
- Kim JH, Choi DK, Lee SS, et al (2010) Enhancement of keratinocyte differentiation by rose absolute oil. *Ann Dermatol* 22:255-261.
- Leung DY (1999) Pathogenesis of atopic dermatitis. *J Allergy Clin Immunol* 104:S99–S108.
- Lian TM, Halliwell RE (1998) Allergen-specific IgE and IgG antibodies in atopic and normal dogs. *Vet Immunol Immunopathol* 66:203–223.
- List K, Szabo R, Wertz PW, et al (2003) Loss of proteolytically processed filaggrin caused by epidermal deletion of Matriptase/MT-SP1. *J Cell Biol* 163:901-910.
- Lloyd C, Yu Q, Cheng J, et al (1995) The basal keratin network of stratified squamous epithelia: defining K15 function in the absence of K14. *J Cell Biol* 129:1329–1344.
- Lloyd DH, Garthwaite G (1982) Epidermal structure and surface topography of canine skin. *Res Vet Sci* 33:99-104.
- Mägert HJ, Ständker L, Kreutzmann P, et al (1999) LEKTI, a novel 15-domain type of human serine proteinase inhibitor. *J Biol Chem* 274:21499-21502.
- Marekov LN, Steinert PM (1998) Ceramides are bound to structural proteins of the human foreskin epidermal cornified cell envelope. *J Biol Chem* 273:17763–17770.



- Marenholz I, Nickel R, Ruschendorf F, et al (2006) Filaggrin loss-of-function mutations predispose to phenotypes involved in the atopic march. *J Allergy Clin Immunol* 118: 866–871.
- Marsella R, Girolomoni G (2009) Canine models of atopic dermatitis: a useful tool with untapped potential. *J Invest Dermatol* 129: 2351–2357.
- Marsella R, Olivry T (2003) Animal models of atopic dermatitis. *Clin Dermatol* 21:122–133.
- Marsella R, Samuelson D, Harrington L (2009) Immunohistochemical evaluation of filaggrin polyclonal antibody in atopic and normal beagles. *Vet Dermatol* 20:547-554.
- Mehrel T, Hohl D, Rothnagel JA, et al (1990) Identification of a major keratinocyte cell envelope protein, loricrin. *Cell* 61:1103–1112.
- Moll R, Moll I, Franke WW (1984) Differences of expression of cytokeratin polypeptides in various epithelial skin tumors. *Arch Dermatol Res* 276:349–363.
- Namkung JH, Lee JE, Kim E, et al (2010) Hint for association of single nucleotide polymorphisms and haplotype in SPINK5 gene with atopic dermatitis in Koreans. *Exp Dermatol* 19:1048-1053.
- Neufang G, Furstenberger G, Heidt M, Marks F, Müller-Decker K (2001) Abnormal differentiation of epidermis in transgenic mice constitutively expressing cyclooxygenase-2 in skin. *Proc Natl Acad Sci U S A* 98:7629-7634.
- Olivry T, DeBoer DJ, Favrot C, et al (2010) Treatment of canine atopic dermatitis: 2010 clinical practice guidelines from the International Task Force on Canine Atopic Dermatitis. *Vet Dermatol* 21:233-248.

- Olivry T, DeBoer DJ, Griffin CE (2001) The ACVD task force on canine atopic dermatitis: forewords and lexicon. *Vet Immunol Immunopathol* 81:143–146.
- Olivry T, Hill PB (2001) The ACVD task force on canine atopic dermatitis (XVIII): histopathology of skin lesions. *Vet Immunol Immunopathol* 81:305–309.
- Olivry T, Marsella R, Iwasaki T, Mueller R (2007) Validation of CADESI-03, a severity scale for clinical trials enrolling dogs with atopic dermatitis. *Vet Dermatol* 18:78–86.
- Olivry T, Naydan DK, Moore PF (1997) Characterization of the cutaneous inflammatory infiltrate in canine atopic dermatitis. *Am J Dermatopathol* 19:477–486.
- Olivry T (2010) New diagnostic criteria for canine atopic dermatitis. *Vet Dermatol* 21:123–126.
- O'Regan GM, Sandilands A, McLean WH, Irvine AD (2009) Filaggrin in atopic dermatitis. *J Allergy Clin Immunol* 124:R2–R6.
- Palmer CN, Irvine AD, Terron-Kwiatkowski A, et al (2006) Common loss-of-function variants of the epidermal barrier protein filaggrin are a major predisposing factor for atopic dermatitis. *Nat Genet* 38:441–446.
- Pfaffl MW (2001) A new mathematical model for relative quantification in real-time RT-PCR. *Nucleic Acids Res* 29:e45.
- Pfaffl MW, Horgan GW, Dempfle L (2002) Relative expression software tool (REST) for group-wise comparison and statistical analysis of relative expression results in real-time PCR. *Nucleic Acids Res* 30:e36.



- Pratt JM, Petty J, Riba-Garcia I, Robertson DH, Gaskell SJ, Oliver SG, Beynon RJ (2002) Dynamics of protein turnover, a missing dimension in proteomics. *Mol Cell Proteomics* 1:579-591.
- Proksch E, Brandner JM, Jensen JM (2008) The skin: an indispensable barrier. *Exp Dermatol* 17:1063-1072.
- Proksch E, Fölster-Holst R, Bräutigam M, Sepehrmanesh M, Pfeiffer S, Jensen JM (2009) Role of the epidermal barrier in atopic dermatitis. *J Dtsch Dermatol Ges* 7:899-910.
- Proksch E, Fölster-Holst R, Jensen JM (2006) Skin barrier function, epidermal proliferation and differentiation in eczema. *J Dermatol Sci* 43:159-169.
- Qian J, Kluger Y, Yu H, Gerstein M (2003) Identification and correction of spurious spatial correlations in microarray data. *Biotechniques* 35:42-44.
- Rothe MJ, Grant-Kels JM (1996) Atopic dermatitis: an update. *J Am Acad Dermatol* 35:1-13.
- Sandilands A, Sutherland C, Irvine AD, McLean WH (2009) Filaggrin in the frontline: role in skin barrier function and disease. *J Cell Sci* 122:1285-1294.
- Sandilands A, Terron-Kwiatkowski A, Hull PR, et al (2007) Comprehensive analysis of the gene encoding filaggrin uncovers prevalent and rare mutations in ichthyosis vulgaris and atopic eczema. *Nat Genet* 39:650-654.
- Sapuntsova SG, Mel'nikova NP, Deigin VI, Kozulin EA, Timoshin SS (2002) Proliferative processes in the epidermis of patients with atopic dermatitis treated with thymodepressin. *Bull Exp Biol Med* 133:488-490.

- Scholzen T, Gerdes J (2000) The Ki-67 protein: from the known and the unknown. *J Cell Physiol* 182:311–322.
- Scott DW, Miller WH, Griffin CE (2001) Skin immune system and allergic skin diseases. In; Muller & Kirk's small animal dermatology. 6th Ed. GH Muller, RW Kirk, DW Scott, CE Griffin (ed.). Philadelphia: Saunders. 543-666.
- Seguchi T, Cui CY, Kusuda S, et al (1996) Decreased expression of filaggrin in atopic skin. *Arch Dermatol Res* 288:442–446.
- Shimada K, Yoon JS, Yoshihara T, Iwasaki T, Nishifuji K (2009) Increased transepidermal water loss and decreased ceramide content in lesional and non-lesional skin of dogs with atopic dermatitis. *Vet Dermatol* 20:541-546.
- Steinert PM, Marekov LN (1997) Direct evidence that involucrin is a major early isopeptide cross-linked component of the keratinocyte cornified cell envelope. *J Biol Chem* 272:2021-2030.
- Strömberg S, Björklund MG, Asplund C, Sköllerö A, Persson A, Wester K, Kampf C, Nilsson P, Andersson A-C, Uhlen M, Kononen J, Ponten F, Asplund A (2007) A high-throughput strategy for protein profiling in cell microarrays using automated image analysis. *Proteomics* 7:2142–2150.
- Sukjumlong S, Dalin AM, Sahlin L, Persson E. (2005) Immunohistochemical studies on the progesterone receptor (PR) in the sow uterus during the oestrous cycle and in inseminated sows at oestrus and early pregnancy. *Reproduction*. 129:349-359.
- Szallasi Z (1999) Genetic network analysis in light of massively parallel biological data acquisition. *Pac Symp Biocomput* 5-16.

- Van Neste D, Lachapelle JM, Desmons F (1979) Atopic dermatitis: A histologic and radioautographic study (after ^3H -Thymidine Labelling) of epidermal and dermal lesions. *Ann Dermatol Venereol* 106:327–335.
- Vickery BP (2007) Skin barrier function in atopic dermatitis. *Curr Opin Pediatr* 19:89–93.
- Walley AJ, Chavanas S, Moffatt MF, et al (2001) Gene polymorphism in Netherton and common atopic disease. *Nat Genet* 29:175–178.
- Watt FM (1983) Involucrin and other markers of keratinocyte terminal differentiation. *J Invest Dermatol* 81:100S–103S.
- Wertz PW, Downing DT (1986) Covalent attachment of omega-hydroxyacid derivatives to epidermal macromolecules: A preliminary characterization. *Biochem Biophys Res Commun* 137:992–997.
- Wertz PW, Swartzendruber DC, Kitko DJ, Madison KC, Downing DT (1989) The role of the corneocyte lipid envelopes in cohesion of the stratum corneum. *J Invest Dermatol* 93:169–172.
- Willemse T (1988) Comparative aspects of canine and human atopic dermatitis. *Semin Vet Med Surg (Small Anim)* 3:255.
- Wood SH, Clements DN, McEwan NA, Nuttall T, Carter SD (2008) Reference genes for canine skin when using quantitative real-time PCR. *Vet Immunol Immunopathol* 126:392–395.

Yager YA, Wilcock, BP (1994) Part II Inflammatory and degenerative lesion of the skin classified by pattern. In: Color Atlas and Text of Surgical Pathology of the Dog and Cat: Dermatopathology and Skin Tumors. St. Louis: Mosby-Year book.51-139.



