

BAB V

KESIMPULAN DAN SARAN

A. Kesimpulan

Berdasarkan hasil uji statistik dan kajian empiris hasil pengamatan dan penelaahan, studi ini menyimpulkan :

1. Ekspresi mRNA gen Reseptor Prolaktin (PRLR) memiliki hubungan yang signifikan terhadap produksi ASI
2. Ekspresi mRNA gen *Signal Transducer And Activator Of Transcription 5* (STAT5) tidak signifikan terhadap produksi ASI

B. Saran

Berdasarkan temuan studi, maka peneliti dapat memberikan beberapa rekomendasi sebagai berikut:

1. Pemeriksaan ekspresi mRNA gen Reseptor Prolaktin (PRLR) terhadap produksi ASI dapat menjadi alternative deteksi dini terhadap gangguan laktasi yang dilakukan pada fase akhir kehamilan.
2. Perlu penelitian lanjut aktifitas regulator negative yang mengganggu ekspresi mRNA gen *Signal Transducer And Activator Of Transcription 5* (STAT5).

DAFTAR PUSTAKA

- Agilent Technologies. (2010). Introduction to Quantitative PCR Methods and Applications Guide. *Introduction to Quantitative PCR Methods and Applications Guide. Analysis*.
- Ahlberg, A. C., Ljung, T., Rosmond, R., McEwen, B., Holm, G., Akesson, H. O., ... Hennighausen, L. (1997). Prolactin-induced mouse mammary carcinomas model estrogen resistant luminal breast cancer. *Cancer Research*. <https://doi.org/10.1074/jbc.M204159200>
- Amatayakul, K., Wongsawasdi, L., Mangklabruks, A., Tansuhaj, A., Ruckphaopunt, S., Chiowanich, P., ... Baum, J. D. (1999). Effects of Parity on Breastfeeding: A Study in the Rural Setting in Northern Thailand. *Journal of Human Lactation*. <https://doi.org/10.1177/089033449901500209>
- Anderson, S. M., Rudolph, M. C., McManaman, J. L., & Neville, M. C. (2007). Key stages in mammary gland development. Secretory activation in the mammary gland: It's not just about milk protein synthesis! *Breast Cancer Research*. <https://doi.org/10.1186/bcr1653>
- Aoki, N., & Matsuda, T. (2000). A cytosolic protein-tyrosine phosphatase PTP1B specifically dephosphorylates and deactivates prolactin-activated STAT5a and STAT5b. *Journal of Biological Chemistry*. <https://doi.org/10.1074/jbc.M005615200>
- Auernhammer, C. J., Bousquet, C., & Melmed, S. (1999). Autoregulation of pituitary corticotroph SOCS-3 expression: Characterization of the murine SOCS-3 promoter. *Proceedings of the National Academy of Sciences of the United States of America*. <https://doi.org/10.1073/pnas.96.12.6964>
- Balogun, T. (2012). *Infant Breastfeeding Patterns By Sex: Do Males Feed More?*
- Banu, B., & Khanom, K. (2012). Effects of Education Level of Father and Mother on Perceptions of Breastfeeding. *Journal of Enam Medical College*. <https://doi.org/10.3329/jemc.v2i2.12840>
- Bauman, D. E., Mather, I. H., Wall, R. J., & Lock, A. L. (2006). Major Advances Associated with the Biosynthesis of Milk. *Journal of Dairy Science*. [https://doi.org/10.3168/jds.S0022-0302\(06\)72192-0](https://doi.org/10.3168/jds.S0022-0302(06)72192-0)
- Bernard, V., Young, J., Chanson, P., & Binart, N. (2015). New insights in prolactin: Pathological implications. *Nature Reviews Endocrinology*. <https://doi.org/10.1038/nrendo.2015.36>
- Bessler, H., Straussberg, R., Hart, J., Notti, I., & Sirota, L. (1996). Human colostrum stimulates cytokine production. *Neonatology*. <https://doi.org/10.1159/000244334>
- Bole-Feysot, C., Goffin, V., Edery, M., Binart, N., & Kelly, P. A. (1998). Prolactin (PRL) and its receptor: Actions, signal transduction pathways and phenotypes observed in PRL receptor knockout mice. *Endocrine Reviews*. <https://doi.org/10.1210/edrv.19.3.0334>

- Boss, M., Gardner, H., & Hartmann, P. (2018). Normal Human Lactation: closing the gap. *F1000Research*. <https://doi.org/10.12688/f1000research.14452.1>
- Bridges, R. S., Scanlan, V. F., Lee, J.-O., & Byrnes, E. M. (2011). Reproductive Experience Alters Prolactin Receptor Expression in Mammary and Hepatic Tissues in Female Rats1. *Biology of Reproduction*. <https://doi.org/10.1095/biolreprod.111.091918>
- Brownell, E., Howard, C. R., Lawrence, R. A., & Dozier, A. M. (2012). Delayed onset lactogenesis II predicts the cessation of any or exclusive breastfeeding. *Journal of Pediatrics*. <https://doi.org/10.1016/j.jpeds.2012.03.035>
- Buonfiglio, D. C., Ramos-Lobo, A. M., Freitas, V. M., Zampieri, T. T., Nagaishi, V. S., Magalhães, M., ... Donato, J. (2016). Obesity impairs lactation performance in mice by inducing prolactin resistance. *Scientific Reports*. <https://doi.org/10.1038/srep22421>
- Cato, K., Sylvén, S. M., Lindbäck, J., Skalkidou, A., & Rubertsson, C. (2017). Risk factors for exclusive breastfeeding lasting less than two months - Identifying women in need of targeted breastfeeding support. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0179402>
- Chen, C. C., Stairs, D. B., Boxer, R. B., Belka, G. K., Horseman, N. D., Alvarez, J. V., & Chodosh, L. A. (2012). Autocrine prolactin induced by the Pten-Akt pathway is required for lactation initiation and provides a direct link between the Akt and Stat5 pathways. *Genes and Development*. <https://doi.org/10.1101/gad.197343.112>
- Chierici, R., Saccomandi, D., & Vigi, V. (1999). Dietary supplements for the lactating mother: influence on the trace element content of milk. *Acta Paediatrica Supplementum*. <https://doi.org/10.1080/080352599750029673>
- Chughtai, N., Schimchowitsch, S., Lebrun, J. J., & Ali, S. (2002). Prolactin induces SHP-2 association with Stat5, nuclear translocation, and binding to the β -casein gene promoter in mammary cells. *Journal of Biological Chemistry*. <https://doi.org/10.1074/jbc.M200156200>
- Clermont, Y., Xia, L., Rambourg, A., Turner, J. D., & Hermo, L. (1993). Structure of the Golgi apparatus in stimulated and nonstimulated acinar cells of mammary glands of the rat. *The Anatomical Record*. <https://doi.org/10.1002/ar.1092370303>
- Clevenger, C. V., & Medaglia, M. V. (1994). The protein tyrosine kinase P59fyn is associated with prolactin (PRL) receptor and is activated by PRL stimulation of T-lymphocytes. *Molecular Endocrinology*. <https://doi.org/10.1210/mend.8.6.7935483>
- Clevenger, C. V., Furth, P. A., & Schuler, L. A. (2006). The Role of Prolactin in Mammary Carcinoma. *Endocrine Reviews*, 24(1), 1–27.
- Colodro-Conde, L., Sánchez-Romera, J. F., Tornero-Gómez, M. J., Pérez-Riquelme, F., Polo-Tomás, M., & Ordoñana, J. R. (2011). Relationship between level of education and breastfeeding duration depends on social context: Breastfeeding trends over a 40-year period in Spain.

- Journal of Human Lactation.*
<https://doi.org/10.1177/0890334411403929>
- Cooijmans, K. H. M., Beijers, R., Rovers, A. C., & de Weerth, C. (2017). Effectiveness of skin-to-skin contact versus care-as-usual in mothers and their full-term infants: Study protocol for a parallel-group randomized controlled trial. *BMC Pediatrics.* <https://doi.org/10.1186/s12887-017-0906-9>
- Cotarla, I., Ren, S., Zhang, Y., Gehan, E., Singh, B., & Furth, P. A. (2004). Stat5a is tyrosine phosphorylated and nuclear localized in a high proportion of human breast cancers. *International Journal of Cancer.* <https://doi.org/10.1002/ijc.11619>
- Cox, D. B., Kent, J. C., Casey, T. M., Owens, R. a, & Hartmann, P. E. (2009). Breast Growth and the Urinary Excretion of Lactose During Human Pregnancy and Early Lactation: Endocrine Relationships. *Experimental Physiology.* <https://doi.org/10.1111/j.1469-445X.1999.01807.x>
- Cui, Y., Riedlinger, G., Miyoshi, K., Tang, W., Li, C., Deng, C. X., ... Hennighausen, L. (2004). Inactivation of Stat5 in mouse mammary epithelium during pregnancy reveals distinct functions in cell proliferation, survival, and differentiation. *Mol Cell Biol.* <https://doi.org/10.1128/MCB.24.18.8037-8047.2004>
- Daglas, M., & Antoniou, E. (2012). Cultural views and practices related to breastfeeding. *Health Science Journal.*
- De Luca, A., Frasquet-Darrieux, M., Gaud, M. A., Christin, P., Boquien, C. Y., Millet, C., ... Hankard, R. (2016). Higher leptin but not human milk macronutrient concentration distinguishes normal-weight from obese mothers at 1-month postpartum. *PLoS ONE,* 11(12), 1–11. <https://doi.org/10.1371/journal.pone.0168568>
- Dennis, C. L. E. (2006). Identifying predictors of breastfeeding self-efficacy in the immediate postpartum period. *Research in Nursing and Health.* <https://doi.org/10.1002/nur.20140>
- Desmond, D., & Meaney, S. (2016). A qualitative study investigating the barriers to returning to work for breastfeeding mothers in Ireland. *International Breastfeeding Journal.* <https://doi.org/10.1186/s13006-016-0075-8>
- Donath, S. M., & Amir, L. H. (2000). Does maternal obesity adversely affect breastfeeding initiation and duration? *Journal of Paediatrics and Child Health.* <https://doi.org/10.1046/j.1440-1754.2000.00562.x>
- García-Lara, N. R., Escuder-Vieco, D., García-Algar, O., De La Cruz, J., Lora, D., & Pallás-Alonso, C. (2012). Effect of freezing time on macronutrients and energy content of breastmilk. *Breastfeeding Medicine.* <https://doi.org/10.1089/bfm.2011.0079>
- Gebregzabiherher, Y., Haftu, A., Weldemariam, S., & Gebrehiwet, H. (2017). The Prevalence and Risk Factors for Low Birth Weight among Term Newborns in Adwa General Hospital, Northern Ethiopia. *Obstetrics and Gynecology International.* <https://doi.org/10.1155/2017/2149156>

- Goffin, V., Bernichetein, S., Touraine, P., & Kelly, P. A. (2005). Development and potential clinical uses of human prolactin receptor antagonists. *Endocrine Reviews*. <https://doi.org/10.1210/er.2004-0016>
- Goffin, V., & Kelly, P. A. (1997). The prolactin/growth hormone receptor family: Structure/function relationships. *Journal of Mammary Gland Biology and Neoplasia*. <https://doi.org/10.1023/A:1026313211704>
- Greer, F. R., Sicherer, S. H., Burks, A. W., Baker, R. D., Bhatia, J. J. S., Daniels, S. R., ... Virant, F. S. (2008). Effects of early nutritional interventions on the development of atopic disease in infants and children: The role of maternal dietary restriction, breastfeeding, timing of introduction of complementary foods, and hydrolyzed formulas. *Pediatrics*. <https://doi.org/10.1542/peds.2007-3022>
- Gross, J., van Dorland, H. A., Bruckmaier, R. M., & Schwarz, F. J. (2011). Performance and metabolic profile of dairy cows during a lactational and deliberately induced negative energy balance with subsequent realimentation. *Journal of Dairy Science*. <https://doi.org/10.3168/jds.2010-3707>
- Hackman, N. M., Schaefer, E. W., Beiler, J. S., Rose, C. M., & Paul, I. M. (2015). Breastfeeding outcome comparison by parity. *Breastfeeding Medicine*. <https://doi.org/10.1089/bfm.2014.0119>
- Harris, J., Stanford, P. M., Oakes, S. R., & Ormandy, C. J. (2004). Prolactin and the prolactin receptor: New targets of an old hormone. *Annals of Medicine*. <https://doi.org/10.1080/07853890410033892>
- Harris, J., Stanford, P. M., Sutherland, K., Oakes, S. R., Naylor, M. J., Robertson, F. G., ... Ormandy, C. J. (2006). Socs2 and Elf5 Mediate Prolactin-Induced Mammary Gland Development. *Molecular Endocrinology*. <https://doi.org/10.1210/me.2005-0473>
- Hassiotou, F., Beltran, A., Chetwynd, E., Stuebe, A. M., Twigger, A. J., Metzger, P., ... Hartmann, P. E. (2012). Breastmilk is a novel source of stem cells with multilineage differentiation potential. *Stem Cells*. <https://doi.org/10.1002/stem.1188>
- Hennighausen, L., & Robinson, G. W. (2005). Information networks in the mammary gland. *Nature Reviews Molecular Cell Biology*, 6(9), 715–725. <https://doi.org/10.1038/nrm1714>
- Horseman, N D, Zhao, W., Montecino-Rodriguez, E., Tanaka, M., Nakashima, K., Engle, S. J., ... Dorshkind, K. (1997). Defective mamopoiesis, but normal hematopoiesis, in mice with a targeted disruption of the prolactin gene. *EMBO Journal*. <https://doi.org/10.1093/emboj/16.23.6926>
- Horseman, Nelson D., & Gregerson, K. A. (2013). Prolactin actions. *Journal of Molecular Endocrinology*. <https://doi.org/10.1530/JME-13-0220>
- Ibeagha-Awemu, E. M., Li, R., Ammah, A. A., Dudemaine, P. L., Bissonnette, N., Benchaar, C., & Zhao, X. (2016). Transcriptome adaptation of the bovine mammary gland to diets rich in unsaturated fatty acids shows greater impact of linseed oil over safflower oil on gene expression and metabolic pathways. *BMC Genomics*.

- <https://doi.org/10.1186/s12864-016-2423-x>
- Jahchan, N. S., Wang, D., Bissell, M. J., & Luo, K. (2012). SnoN regulates mammary gland alveogenesis and onset of lactation by promoting prolactin/Stat5 signaling. *Development*. <https://doi.org/10.1242/dev.079616>
- Jantscher-Krenn, E., & Bode, L. (2012). Human milk oligosaccharides and their potential benefits for the breast-fed neonate. *Minerva Pediatrica*.
- Jensen, J., Galsgaard, E. D., Karlsen, A. E., Lee, Y. C., & Nielsen, J. H. (2005). STAT5 activation by human GH protects insulin-producing cells against interleukin-1 β , interferon- γ and tumour necrosis factor- α -induced apoptosis independent of nitric oxide production. *Journal of Endocrinology*. <https://doi.org/10.1677/joe.1.06086>
- Kent, J. C., Gardner, H., & Geddes, D. T. (2016). Breastmilk production in the first 4 weeks after birth of term infants. *Nutrients*. <https://doi.org/10.3390/nu8120756>
- Kile, B. T., & Alexander, W. S. (2001). The suppressors of cytokine signalling (SOCS). *Cellular and Molecular Life Sciences*. <https://doi.org/10.1007/PL00000801>
- Lauer, E. A., Armenti, K., Henning, M., & Sirois, L. (2019). Identifying barriers and supports to breastfeeding in the workplace experienced by mothers in the New Hampshire special supplemental nutrition program for women, infants, and children utilizing the total worker health framework. *International Journal of Environmental Research and Public Health*. <https://doi.org/10.3390/ijerph16040529>
- Lavnilovitch, E., Cardiff, R. D., Groner, B., & Barash, I. (2004). Deregulation of Stat5 expression and activation causes mammary tumors in transgenic mice. *International Journal of Cancer*, 112(4), 607–619. <https://doi.org/10.1002/ijc.20484>
- Lee, S., & Kelleher, S. L. (2016). Biological underpinnings of breastfeeding challenges: the role of genetics, diet, and environment on lactation physiology. *American Journal of Physiology - Endocrinology And Metabolism*, 311(2), E405–E422. <https://doi.org/10.1152/ajpendo.00495.2015>
- Leonard, S. A., Labiner-Wolfe, J., Geraghty, S. R., & Rasmussen, K. M. (2011). Associations between high prepregnancy body mass index, breast-milk expression, and breast-milk production and feeding. *American Journal of Clinical Nutrition*. <https://doi.org/10.3945/ajcn.110.002352>
- Lin, J. X., & Leonard, W. J. (2000). The role of Stat5a and Stat5b in signaling by IL-2 family cytokines. *Oncogene*. <https://doi.org/10.1038/sj.onc.1203523>
- Lindeman, G. J., Wittlin, S., Lada, H., Naylor, M. J., Santamaria, M., Zhang, J. G., ... Visvader, J. (2001). SOCS1 deficiency results in accelerated mammary gland development and rescues lactation in prolactin receptor-deficient mice. *Genes and Development*. <https://doi.org/10.1101/gad.880801>

- Longhi, S. A., Cortés, M. M., & Retegui, L. A. (2003). 22- and 20 kDa-human growth hormones bind to different sites within certain cellular receptors. *Growth Hormone and IGF Research*. [https://doi.org/10.1016/S1096-6374\(03\)00125-4](https://doi.org/10.1016/S1096-6374(03)00125-4)
- Lovelady, C. A. (2005). Is maternal obesity a cause of poor lactation performance? *Nutrition Reviews*. <https://doi.org/10.1301/nr.2005.oct.352-355>
- Macias, H., & Hinck, L. (2012). Mammary gland development. *Wiley Interdisciplinary Reviews: Developmental Biology*. <https://doi.org/10.1002/wdev.35>
- McAveney, K. M., Book, M. L., Ling, P., Chebath, J., & Yu-Lee, L. Y. (2000). Association of 2',5'-oligoadenylate synthetase with the prolactin (PRL) receptor: Alteration in PRL-inducible STAT1 (signal transducer and activator of transcription 1) signaling to the IRF-1 (interferon-regulatory factor 1) promoter. *Molecular Endocrinology*. <https://doi.org/10.1210/me.14.2.295>
- Merchant, K., Martorell, R., & Haas, J. (1990). Maternal and fetal responses to the stresses of lactation concurrent with pregnancy and of short recuperative intervals. *American Journal of Clinical Nutrition*. <https://doi.org/10.1093/ajcn/52.2.280>
- Misra, A., Ray, S., & Patrikar, S. (2015). A longitudinal study to determine association of various maternal factors with neonatal birth weight at a tertiary care hospital. *Medical Journal Armed Forces India*. <https://doi.org/10.1016/j.mjafi.2015.03.001>
- Miyoshi, K., Shillingford, J. M., Smith, G. H., Grimm, S. L., Wagner, K. U., Oka, T., ... Hennighausen, L. (2001). Signal transducer and activator of transcription (Stat) 5 controls the proliferation and differentiation of mammary alveolar epithelium. *Journal of Cell Biology*. <https://doi.org/10.1083/jcb.200107065>
- Mohammad, M. A., Hadsell, D. L., & Haymond, M. W. (2012). Gene regulation of UDP-galactose synthesis and transport: Potential rate-limiting processes in initiation of milk production in humans. *American Journal of Physiology - Endocrinology and Metabolism*. <https://doi.org/10.1152/ajpendo.00175.2012>
- Mohammad, M. A., & Haymond, M. W. (2013). Regulation of lipid synthesis genes and milk fat production in human mammary epithelial cells during secretory activation. *American Journal of Physiology. Endocrinology and Metabolism*. <https://doi.org/10.1152/ajpendo.00052.2013>
- Morales, F. C., Hayashi, Y., Van Pelt, C. S., & Georgescu, M. M. (2012). NHERF1/EBP50 controls lactation by establishing basal membrane polarity complexes with prolactin receptor. *Cell Death and Disease*. <https://doi.org/10.1038/cddis.2012.131>
- Murtagh, L., & Moulton, A. D. (2011). Working mothers, breastfeeding, and the law. *American Journal of Public Health*. <https://doi.org/10.2105/AJPH.2009.185280>
- Negin, J., Coffman, J., Vizintin, P., & Raynes-Greenow, C. (2016). The

- influence of grandmothers on breastfeeding rates: A systematic review. *BMC Pregnancy and Childbirth*. <https://doi.org/10.1186/s12884-016-0880-5>
- Nevalainen, M. T., Xie, J., Torhorst, J., Bubendorf, L., Haas, P., Kononen, J., ... Rui, H. (2004). Signal transducer and activator of transcription-5 activation and breast cancer prognosis. *Journal of Clinical Oncology*. <https://doi.org/10.1200/JCO.2004.11.046>
- Neville, M. C., McFadden, T. B., & Forsyth, I. (2002). Hormonal regulation of mammary differentiation and milk secretion. *Journal of Mammary Gland Biology and Neoplasia*. <https://doi.org/10.1023/A:1015770423167>
- Neville, M. C., Mcmanaman, J. L., & Neville, M. C. (2003). Physiology of lactation M ammary physiology and milk secretion. *Advanced Drug Delivery Reviews*.
- Newey, P. J., Gorvin, C. M., Cleland, S. J., Willberg, C. B., Bridge, M., Azharuddin, M., ... Thakker, R. V. (2013). Mutant Prolactin Receptor and Familial Hyperprolactinemia. *New England Journal of Medicine*. <https://doi.org/10.1056/NEJMoa1307557>
- Nyante, S. J., Faupel-Badger, J. M., Sherman, M. E., Pfeiffer, R. M., Gaudet, M. M., Falk, R. T., ... Figueroa, J. D. (2011). Genetic variation in PRL and PRLR, and relationships with serum prolactin levels and breast cancer risk: results from a population-based case-control study in Poland. *Breast Cancer Research : BCR*. <https://doi.org/10.1186/bcr2864>
- Oakes, S. R., Rogers, R. L., Naylor, M. J., & Ormandy, C. J. (2008). Prolactin regulation of mammary gland development. *Journal of Mammary Gland Biology and Neoplasia*. <https://doi.org/10.1007/s10911-008-9069-5>
- Ohmori, Y., Schreiber, R. D., & Hamilton, T. A. (1997). Synergy between interferon- γ and tumor necrosis factor- α in transcriptional activation is mediated by cooperation between signal transducer and activator of transcription 1 and nuclear factor κ B. *Journal of Biological Chemistry*. <https://doi.org/10.1074/jbc.272.23.14899>
- Oliver, C. H., & Watson, C. J. (2013). Making milk: A new link between STAT5 and Akt1. *Jakstat*, 2(2), e23228. <https://doi.org/10.4161/jkst.23228>
- Onah, S., Osuorah, D. I. C., Ebenebe, J., Ezechukwu, C., Ekwochi, U., & Ndukwu, I. (2014). Infant feeding practices and maternal socio-demographic factors that influence practice of exclusive breastfeeding among mothers in Nnewi South-East Nigeria: A cross-sectional and analytical study. *International Breastfeeding Journal*. <https://doi.org/10.1186/1746-4358-9-6>
- Palmquist, D. L., Lock, A. L., Shingfield, K. J., & Bauman, D. E. (2005). Biosynthesis of Conjugated Linoleic Acid in Ruminants and Humans. *Advances in Food and Nutrition Research*. [https://doi.org/10.1016/S1043-4526\(05\)50006-8](https://doi.org/10.1016/S1043-4526(05)50006-8)

- Pang, W. W., & Hartmann, P. E. (2007). Initiation of human lactation: Secretory differentiation and secretory activation. *Journal of Mammary Gland Biology and Neoplasia*. <https://doi.org/10.1007/s10911-007-9054-4>
- Parker, L. A., Sullivan, S., Krueger, C., & Mueller, M. (2015). Association of timing of initiation of breastmilk expression on milk volume and timing of lactogenesis stage II among mothers of very low-birth-weight infants. *Breastfeeding Medicine*. <https://doi.org/10.1089/bfm.2014.0089>
- Prime, D. K., Geddes, D. T., Hepworth, A. R., Trengove, N. J., & Hartmann, P. E. (2011). Comparison of the Patterns of Milk Ejection During Repeated Breast Expression Sessions in Women. *Breastfeeding Medicine*. <https://doi.org/10.1089/bfm.2011.0014>
- Quintas-Cardama, A., & Cortes, J. (2009). Molecular biology of bcr-abl1-positive chronic myeloid leukemia. *Blood*. <https://doi.org/10.1182/blood-2008-03-144790>
- Radhakrishnan, A., Raju, R., Tuladhar, N., Subbannayya, T., Thomas, J. K., Goel, R., ... Chatterjee, A. (2012). A pathway map of prolactin signaling. *Journal of Cell Communication and Signaling*. <https://doi.org/10.1007/s12079-012-0168-0>
- Reichenstein, M., Rauner, G., & Barash, I. (2011). Conditional repression of STAT5 expression during lactation reveals its exclusive roles in mammary gland morphology, milk-protein gene expression, and neonate growth. *Molecular Reproduction and Development*. <https://doi.org/10.1002/mrd.21345>
- Reynolds, C. K., Harmon, D. L., & Cecava, M. J. (1994). Absorption and Delivery of Nutrients for Milk Protein Synthesis by Portal-Drained Viscera. *Journal of Dairy Science*. [https://doi.org/10.3168/jds.S0022-0302\(94\)77220-9](https://doi.org/10.3168/jds.S0022-0302(94)77220-9)
- Rius, A. G., Appuhamy, J. A. D. R. N., Cyriac, J., Kirovski, D., Becvar, O., Escobar, J., ... Hanigan, M. D. (2010). Regulation of protein synthesis in mammary glands of lactating dairy cows by starch and amino acids. *Journal of Dairy Science*. <https://doi.org/10.3168/jds.2009-2743>
- RJ, P., CE, M., & WS, J. (2000). Colostrum and milk-derived peptide growth factors for the treatment of gastrointestinal disorders. *American Journal of Clinical Nutrition*.
- Rozakis-Adcock, M., & Kelly, P. A. (1992). Identification of ligand binding determinants of the prolactin receptor. *Journal of Biological Chemistry*.
- Russo, J., Hu, Y. F., Silva, I. D., & Russo, I. H. (2001). Cancer risk related to mammary gland structure and development. *Microscopy Research and Technique*. [https://doi.org/10.1002/1097-0029\(20010115\)52:2<204::AID-JEMT1006>3.0.CO;2-F](https://doi.org/10.1002/1097-0029(20010115)52:2<204::AID-JEMT1006>3.0.CO;2-F)
- Russo, Jose, & Russo, I. H. (2004). Development of the human breast. In *Maturitas*. <https://doi.org/10.1016/j.maturitas.2004.04.011>
- Saarela, T., Kokkonen, J., & Koivisto, M. (2005). Macronutrient and energy contents of human milk fractions during the first six months of lactation. *Acta Paediatrica, International Journal of Paediatrics*.

- <https://doi.org/10.1080/08035250510036499>
- Sanz-Moreno, A., Fuhrmann, D., Wolf, E., Von Eyss, B., Eilers, M., & Elsässer, H. P. (2014). Miz1 deficiency in the mammary gland causes a lactation defect by attenuated stat5 expression and phosphorylation. *PLoS ONE*. <https://doi.org/10.1371/journal.pone.0089187>
- Sarki, M., Parlesak, A., & Robertson, A. (2019). Comparison of national cross-sectional breast-feeding surveys by maternal education in Europe (2006-2016). *Public Health Nutrition*. <https://doi.org/10.1017/S1368980018002999>
- Scott, J. A., Binns, C. W., & Oddy, W. H. (2007). Predictors of delayed onset of lactation. *Maternal and Child Nutrition*. <https://doi.org/10.1111/j.1740-8709.2007.00096.x>
- Sinclair, L. A., Lock, A. L., Early, R., & Bauman, D. E. (2007). Effects of trans-10, cis-12 conjugated linoleic acid on ovine milk fat synthesis and cheese properties. *Journal of Dairy Science*. <https://doi.org/10.3168/jds.2007-0007>
- Sternlicht, M. D. (2005). Key stages in mammary gland development: The cues that regulate ductal branching morphogenesis. *Breast Cancer Research*. <https://doi.org/10.1186/bcr1368>
- Sternlicht, M. D., Affolter, M., Bellusci, S., Itoh, N., Shilo, B., Thiery, J., ... Garrod, D. (2006). Key stages in mammary gland development: The cues that regulate ductal branching morphogenesis. *Breast Cancer Research*. <https://doi.org/10.1186/bcr1368>
- Sun, W., Xu, W., Snyder, M., He, W., Ho, H., Ivashkiv, L. B., & Zhang, J. J. (2005). The conserved Leu-724 residue is required for both serine phosphorylation and co-activator recruitment for Stat1-mediated transcription activation in response to interferon- γ . *Journal of Biological Chemistry*. <https://doi.org/10.1074/jbc.M505797200>
- Suzuki, R., Atherton, a J., O'Hare, M. J., Entwistle, a, Lakhani, S. R., & Clarke, C. (2000). Proliferation and differentiation in the human breast during pregnancy. *Differentiation; Research in Biological Diversity*. <https://doi.org/10.1046/j.1432-0436.2000.660205.x>
- Syam, A., Syafar, M., Amiruddin, R., Muzakkir, Darwis, Darmawan, S., ... Mallongi, A. (2017). Early breastfeeding initiation: Impact of socio-demographic, knowledge and social support factors. *Pakistan Journal of Nutrition*, 16(4). <https://doi.org/10.3923/pjn.2017.207.215>
- Tomic, S., Chughtai, N., & Ali, S. (1999). SOCS-1, -2, -3: Selective targets and functions downstream of the prolactin receptor. *Molecular and Cellular Endocrinology*. [https://doi.org/10.1016/S0303-7207\(99\)00180-X](https://doi.org/10.1016/S0303-7207(99)00180-X)
- Toral, P. G., Chilliard, Y., Rouel, J., Leskinen, H., Shingfield, K. J., & Bernard, L. (2015). Comparison of the nutritional regulation of milk fat secretion and composition in cows and goats. *Journal of Dairy Science*. <https://doi.org/10.3168/jds.2015-9649>
- Turcksin, R., Bel, S., Galjaard, S., & Devlieger, R. (2014). Maternal obesity and breastfeeding intention, initiation, intensity and duration: A

- systematic review. *Maternal and Child Nutrition*. <https://doi.org/10.1111/j.1740-8709.2012.00439.x>
- Visvader, J. E. (2009). Keeping abreast of the mammary epithelial hierarchy and breast tumorigenesis. *Genes and Development*. <https://doi.org/10.1101/gad.1849509>
- Wagner, K.-U., Krempler, A., Triplett, A. a, Qi, Y., George, N. M., Zhu, J., & Rui, H. (2004). Impaired alveogenesis and maintenance of secretory mammary epithelial cells in Jak2 conditional knockout mice. *Molecular and Cellular Biology*. <https://doi.org/10.1128/MCB.24.12.5510-5520.2004>
- Wagner, K. U., & Rui, H. (2008). Jak2/Stat5 signaling in mammogenesis, breast cancer initiation and progression. *Journal of Mammary Gland Biology and Neoplasia*. <https://doi.org/10.1007/s10911-008-9062-z>
- Wang, Y. -f. (1997). Multiple Prolactin (PRL) Receptor Cytoplasmic Residues and Stat1 Mediate PRL Signaling to the Interferon Regulatory Factor-1 Promoter. *Molecular Endocrinology*. <https://doi.org/10.1210/me.11.9.1353>
- Watson, C. J., & Khaled, W. T. (2008). Mammary development in the embryo and adult: a journey of morphogenesis and commitment. *Development*. <https://doi.org/10.1242/dev.005439>
- Wyszomierski, S. L., & Rosen, J. M. (2015). Cooperative Effects of STAT5 (Signal Transducer and Activator of Transcription 5) and C / EBP α β on α -Casein Gene Transcription Are Mediated by the Glucocorticoid Receptor, 5(November), 228–240.
- Yonekura, S., Miyazaki, H., & Tokutake, Y. (2015). Comparative Expression Profiling of Lactogenic Hormone Receptor and It's Signaling Molecules of Bovine Mammary Glands during lactation. *Open Journal of Animal Sciences*. <https://doi.org/10.4236/ojas.2015.52013>
- Yu-Lee, L. (2001). Stimulation of interferon regulatory factor-1 by prolactin. *Lupus*. <https://doi.org/10.1191/096120301717164921>
- Yu-Lee, L. Y. (2002). Prolactin modulation of immune and inflammatory responses. *Recent Progress in Hormone Research*. <https://doi.org/10.1210/rp.57.1.435>
- Zhu, M. H., John, S., Berg, M., & Leonard, W. J. (1999). Functional association of Nmi with Stat5 and Stat1 in IL-2- and IFNy-mediated signaling. *Cell*. [https://doi.org/10.1016/S0092-8674\(00\)80965-4](https://doi.org/10.1016/S0092-8674(00)80965-4)