

## 7 Referenzen

- Achiron,R., Kreiser,D., and Achiron,A. (2000). Axial growth of the fetal eye and evaluation of the hyaloid artery: in utero ultrasonographic study. *Prenat.Diagn.* 20, 894-899.
- Aiello,L.P., Avery,R.L., Arrigg,P.G., Keyt,B.A., Jampel,H.D., Shah,S.T., Pasquale,L.R., Thieme,H., Iwamoto,M.A., Park,J.E., Nguyen,H.V., Aiello,L.M., Ferrara,N., and King,G.L. (1994). Vascular endothelial growth factor in ocular fluid of patients with Diabetic Retinopathy and other retinal disorders. *The New England Journal of Medicine* 331, 1480-1487.
- Ajo,R., Cacicedo,L., Navarro,C., and Sanchez-Franco,F. (2003). Growth hormone action on proliferation and differentiation of cerebral cortical cells from fetal rat. *Endocrinology* 144, 1086-1097.
- Benjamin,L.E., Hemo,I., and Keshet,E. (1998). A plasticity window for blood vessel remodelling is defined by pericyte coverage of the preformed endothelial network and is regulated by PDGF-B and VEGF. *Development* 125, 1591-1598.
- Benson,G.V., Lim,H., Paria,B.C., Satokata,I., Dey,S.K., and Maas,R.L. (1996). Mechanisms of reduced fertility in Hoxa-10 mutant mice: uterine homeosis and loss of maternal Hoxa-10 expression. *Development* 122, 2687-2696.
- Benson,W.E. (1995). Familial exudative vitreoretinopathy. *Trans.Am.Ophthalmol.Soc.* 93, 473-521.
- Bergen,A.A., Berger,W., Chen,Z.Y., Diergaard,P.J., Bleeker-Wagemakers,E.M., Battinelli,E.M., Warburg,M., Ropers,H.H., and Craig,I.W. (1994). Norrie Disease. In *Molecular Genetics of Inherited Eye Disorders*, A. F. Wright and Jay Barrie, eds. (Chur: harwood academic publishers), pp. 321-338.
- Berger,W. (1998). Molecular dissection of Norrie disease. *Acta Anat.(Basel)* 162, 95-100.
- Berger,W., Meindl,A., van de Pol,T.J., Cremers,F.P., Ropers,H.H., Doerner,C., Monaco,A., Bergen,A.A., Lebo,R., Warburg,M., Zergollen,L., Lorenz,B., Gal,A., Bleeker-Wagemakers,E.M., and Meitinger,T. (1992a). Isolation of a candidate gene for Norrie disease by positional cloning. *Nat.Genet.* 1, 199-203.
- Berger,W. and Ropers H.-H. (2001). Norrie disease. In *The Metabolic and Molecular Basis of Inherited Disease*, (New York: McGraw-Hill Professional), pp. 5977-5985.
- Berger,W., van de Pol,D., Bachner,D., Oerlemans,F., Winkens,H., Hameister,H., Wieringa,B., Hendriks,W., and Ropers,H.H. (1996). An animal model for Norrie disease (ND): gene targeting of the mouse ND gene. *Human Molecular Genetics* 5, 51-59.
- Berger,W., van de,P.D., Warburg,M., Gal,A., Bleeker-Wagemakers,L., de Silva,H., Meindl,A., Meitinger,T., Cremers,F., and Ropers,H.H. (1992b). Mutations in the candidate gene for Norrie disease. *Human Molecular Genetics* 1, 461-465.
- Black,G.C., Perveen,R., Bonshek,R., Cahill,M., Clayton-Smith,J., Lloyd,I.C., and McLeod,D. (1999). Coats' disease of the retina (unilateral retinal telangiectasis) caused by somatic mutation in the NDP gene: a role for norrin in retinal angiogenesis. *Human Molecular Genetics* 8, 2031-2035.
- Boisclair,Y.R., Hurst,K.R., Ueki,I., Tremblay,M.L., and Ooi,G.T. (2000). Regulation and role of the acid-labile subunit of the 150-kilodalton insulin-like growth factor complex in the mouse. *Pediatr.Nephrol.* 14, 562-566.
- Boisclair,Y.R., Seto,D., Hsieh,S., Hurst,K.R., and Ooi,G.T. (1996). Organization and chromosomal localization of the gene encoding the mouse acid labile subunit of the insulin-like growth factor binding complex. *Proc Natl.Acad.Sci.U.S.A* 93, 10028-10033.
- Cai,L.Q., Cao,Y.J., and Duan,E.K. (2000). Effects of leukaemia inhibitory factor on Embryo implantation in the mouse. *Cytokine* 12, 1676-1682.
- Carmeliet,P. (2000a). Mechanisms of angiogenesis and arteriogenesis. *Nat.Med.* 6, 389-395.

- Carmeliet,P. (2000b). VEGF gene therapy: stimulating angiogenesis or angioma-genesis? *Nat.Med* 6, 1102-1103.
- Carmeliet,P. and Jain,R.K. (2000). Angiogenesis in cancer and other diseases. *Nature* 407, 249-257.
- Chan-Ling,T., McLeod,D.S., Hughes,S., Baxter,L., Chu,Y., Hasegawa,T., and Luty,G.A. (2004). Astrocyte-endothelial cell relationships during human retinal vascular development. *Investigative Ophthalmology Visual Science* 45, 2020-2032.
- Chen,Y., Dougherty,E.R., and Bittner,M.L. (1997). Ratio-based decisions and the quantitative analysis of cDNA microarray images. *J.Biomed.Opt.* 2, 364-374.
- Chen,Z.Y., Battinelli,E.M., Fielder,A., Bunday,S., Sims,K., Breakefield,X.O., and Craig,I.W. (1993a). A mutation in the Norrie disease gene (NDP) associated with X-linked familial exudative vitreoretinopathy. *Nat.Genet.* 5, 180-183.
- Chen,Z.Y., Battinelli,E.M., Woodruff,G., Young,I., Breakefield,X.O., and Craig,I.W. (1993b). Characterization of a mutation within the NDP gene in a family with a manifesting female carrier. *Human Molecular Genetics* 2, 1727-1729.
- Chen,Z.Y., Hendriks,R.W., Jobling,M.A., Powell,J.F., Breakefield,X.O., Sims,K.B., and Craig,I.W. (1992). Isolation and characterization of a candidate gene for Norrie disease. *Nat.Genet.* 1, 204-208.
- Chen,Z.Y., Zhang,D.S., Adams,J.C., Ropers,H.H., Brown,M.C., Berger,W., and Corey,D.C. (1998). Inner ear pathology in the Norrie knockout mouse supports the role of norrin as a growth factor required for survival and maintenance of cells. *Am.J.Hum.Genet. Supplement* 63, A355.
- Chou,Q., Russell,M., Birch,D.E., Raymond,J., and Bloch,W. (1992). Prevention of pre-PCR mis-priming and primer dimerization improves low-copy-number amplifications. *Nucleic Acids Res* 20, 1717-1723.
- Chynn,E.W., Walton,D.S., Hahn,L.B., and Dryja,T.P. (1996). Norrie disease. Diagnosis of a simplex case by DNA analysis. *Archives of Ophthalmology* 114, 1136-1138.
- Clarke,E. (1898). 'Pseudo-glioma' in both eyes. *Trans.Ophthal.Soc.U.K.* 18, 136-138.
- Connolly,S.E., Hores,T.A., Smith,L.E., and D'Amore,P.A. (1988). Characterization of vascular development in the mouse retina. *Microvasc.Res.* 36, 275-290.
- Criswick,V.G. and Schepens,C.L. (1969). Familial exudative vitreoretinopathy. *Am.J.Ophthalmol.* 68, 578-594.
- de Crecchio,G., Simonelli,F., Nunziata,G., Mazzeo,S., Greco,G.M., Rinaldi,E., Ventruto,V., Ciccodicola,A., Miano,M.G., Testa,F., Curci,A., D'Urso,M., Rinaldi,M.M., Cavaliere,M.L., and Castelluccio,P. (1998). Autosomal recessive familial exudative vitreoretinopathy: evidence for genetic heterogeneity. *Clinical Genetics* 54, 315-320.
- Deijen,J.B., de Boer,H., and van der Veen,E.A. (1998). Cognitive changes during growth hormone replacement in adult men. *Psychoneuroendocrinology* 23, 45-55.
- Diatchenko,L., Lukyanov,S., Lau,Y.F., and Siebert,P.D. (1999). Suppression subtractive hybridization: a versatile method for identifying differentially expressed genes. *Methods Enzymol.* 303, 349-380.
- Diatchenko,L., Lau,Y.F.C., Campbell,A.P., Chenchik,A., Moqadam,F., Huang,B., Lukyanov,S., Lukyanov,K., Gurskaya,N., Sverdlov,E.D., and Siebert,P.D. (1996). Suppression subtractive hybridization: A method for generating differentially regulated or tissue-specific cDNA probes and libraries. *Proceedings of the National Academy of Sciences* 93, 6025-6030.
- Dorrell,M.I., Aguilar,E., and Friedlander,M. (2002). Retinal vascular development is mediated by endothelial filopodia, a preexisting astrocytic template and specific R-cadherin adhesion. *Invest Ophthalmol. Vis.Sci.* 43, 3500-3510.

- Downey,L.M., Keen,T.J., Roberts,E., Mansfield,D.C., Bamashmus,M., and Inglehearn,C.F. (2001). A new locus for autosomal dominant familial exudative vitreoretinopathy maps to chromosome 11p12-13. *Am.J.Hum.Genet.* 68, 778-781.
- Eisel,D. (1996). *Nonradioactive In Situ Hybridization Application Manual*. (Mannheim: Roche (Boehringer Mannheim GmbH, Biochemica)).
- Feinberg,A.P. and Vogelstein,B. (1983). A technique for radiolabeling DNA restriction endonuclease fragments to high specific activity. *Anal.Biochem.* 132, 6-13.
- Fries,P., Fernandez,G., and Jensen,O. (2003). When neurons form memories. *Trends in Neurosciences* 26, 123-124.
- Fruttiger,M. (2002). Development of the mouse retinal vasculature: angiogenesis versus vasculogenesis. *Invest Ophthalmol.Vis.Sci.* 43, 522-527.
- Fuchs,S., Kellner,U., Wedemann,H., and Gal,A. (1995). Missense mutation (Arg121Trp) in the Norrie disease gene associated with x-linked exudative vitreoretinopathy. *Hum.Mutat.* 6, 257-259.
- Fuchs,S., van de,P.D., Beudt,U., Kellner,U., Meire,F., Berger,W., and Gal,A. (1996). Three novel and two recurrent mutations of the Norrie disease gene in patients with Norrie syndrome. *Hum.Mutat.* 8, 85-88.
- Fuchs,S., Xu,S.Y., Caballero,M., Salcedo,M., La,O.A., Wedemann,H., and Gal,A. (1994). A missense point mutation (Leu13Arg) of the Norrie disease gene in a large Cuban kindred with Norrie disease. *Hum.Mol Genet* 3, 655-656.
- Fuentes,J.J., Volpini,V., Fernandez-Toral,F., Coto,E., and Estivill,X. (1993). Identification of two new missense mutations (K58N and R121Q) in the Norrie disease (ND) gene in two Spanish families. *Human Molecular Genetics* 2, 1953-1955.
- Gal,A., Veske,A., Jojart,G., Grammatico,B., Huber,B., Gu,S., del Porto,G., and Senyi,K. (1996). Norrie-Warburg syndrome: two novel mutations in patients with classical clinical phenotype. *Acta Ophthalmol Scand.Suppl* 13-16.
- Gale,N.W., Thurston,G., Hackett,S.F., Renard,R., Wang,Q., McClain,J., Martin,C., Witte,C., Witte,M.H., Jackson,D., Suri,C., Campochiaro,P.A., Wiegand,S.J., and Yancopoulos,G.D. (2002). Angiopoietin-2 is required for postnatal angiogenesis and lymphatic patterning, and only the latter role is rescued by Angiopoietin-1. *Dev.Cell* 3, 411-423.
- Gariano,R.F. (2003). Cellular mechanisms in retinal vascular development. *Prog.Retin.Eye Res.* 22, 295-306.
- Goodwin,A.M. and D'Amore,P.A. (2002). Wnt signaling in the vasculature. *Angiogenesis.* 5, 1-9.
- Gossard,F., Dihl,F., Pelletier,G., Dubois,P.M., and Morel,G. (1987). In situ hybridization to rat brain and pituitary gland of growth hormone cDNA. *Neurosci.Lett.* 79, 251-256.
- Hafez,M., El-Thhan,H., Abdalla,A., Ibrahim,Z., Tawfik,A., and El-Desoky,M. (1982). A presumptive new presentation of Norrie's disease. *Egypt.J.Genet.Cytol.* 11, 213-225.
- Haider,M.Z., Devarajan,L.V., Al Essa,M., and Kumar,H. (2002). A C597-->A polymorphism in the Norrie disease gene is associated with advanced retinopathy of prematurity in premature Kuwaiti infants. *J.Biomed.Sci.* 9, 365-370.
- Haider,M.Z., Devarajan,L.V., Al Essa,M., Srivastva,B.S., Kumar,H., Azad,R., and Rashwan,N. (2000). Missense mutations in norrie disease gene are not associated with advanced stages of retinopathy of prematurity in Kuwaiti arabs. *Biol.Neonate* 77, 88-91.
- Haider,M.Z., Devarajan,L.V., Al Essa,M., Srivastva,B.S., Kumar,H., Azad,R., and Rashwan,N. (2001). Retinopathy of prematurity: mutations in the Norrie disease gene and the risk of progression to advanced stages. *Pediatr.Int.* 43, 120-123.

- Hellstrom,A., Carlsson,B., Niklasson,A., Segnestam,K., Boguszewski,M., de Lacerda,L., Savage,M., Svensson,E., Smith,L., Weinberger,D., Albertsson,W.K., and Laron,Z. (2002). IGF-I is critical for normal vascularization of the human retina. *J.Clin.Endocrinol.Metab* 87, 3413-3416.
- Hellstrom,A., Perruzzi,C., Ju,M., Engstrom,E., Hard,A.L., Liu,J.L., Albertsson-Wikland,K., Carlsson,B., Niklasson,A., Sjedell,L., LeRoith,D., Senger,D.R., and Smith,L.E. (2001). Low IGF-I suppresses VEGF-survival signaling in retinal endothelial cells: direct correlation with clinical retinopathy of prematurity. *Proc.Natl.Acad.Sci.U.S.A* 98, 5804-5808.
- Hemberger,M., Nozaki,T., Masutani,M., and Cross,J.C. (2003). Differential expression of angiogenic and vasodilatory factors by invasive trophoblast giant cells depending on depth of invasion. *Dev.Dyn.* 227, 185-191.
- Hiraoka,M., Berinstein,D.M., Trese,M.T., and Shastry,B.S. (2001). Insertion and deletion mutations in the dinucleotide repeat region of the Norrie disease gene in patients with advanced retinopathy of prematurity. *J.Hum.Genet.* 46, 178-181.
- Hirschi,K.K. and D'Amore,P.A. (1996). Pericytes in the microvasculature. *Cardiovascular Research* 32, 687-698.
- Hughes,S., Yang,H., and Chan-Ling,T. (2000). Vascularization of the human fetal retina: Roles of vasculogenesis and angiogenesis. *Investigative Ophthalmology Visual Science* 41, 1217-1228.
- Isashiki,Y., Ohba,N., Yanagita,T., Hokita,N., Doi,N., Nakagawa,M., Ozawa,M., and Kuroda,N. (1995a). Novel mutation at the initiation codon in the Norrie disease gene in two Japanese families. *Hum.Genet* 95, 105-108.
- Isashiki,Y., Ohba,N., Yanagita,T., Hokita,N., Hotta,Y., Hayakawa,M., Fujiki,K., and Tanabe,U. (1995b). Mutations in the Norrie disease gene: a new mutation in a Japanese family. *British Journal of Ophthalmology* 79, 703-704.
- Ito,M. and Yoshioka,M. (1999). Regression of the hyaloid vessels and pupillary membrane of the mouse. *Anat.Embryol.(Berl)* 200, 403-411.
- Iwaki,T., Sandoval-Cooper,M.J., Paiva,M., Kobayashi,T., Ploplis,V.A., and Castellino,F.J. (2002). Fibrinogen stabilizes placental-maternal attachment during embryonic development in the mouse. *Am.J.Pathol.* 160, 1021-1034.
- Johansson,J.O., Larson,G., Andersson,M., Elmgren,A., Hynsjo,L., Lindahl,A., Lundberg,P.A., Isaksson,O.G., Lindstedt,S., and Bengtsson,B.A. (1995). Treatment of growth hormone-deficient adults with recombinant human growth hormone increases the concentration of growth hormone in the cerebrospinal fluid and affects neurotransmitters. *Neuroendocrinology* 61, 57-66.
- Johnson,K., Mintz-Hittner,H.A., Conley,Y.P., and Ferrell,R.E. (1996). X-linked exudative vitreoretinopathy caused by an arginine to leucine substitution (R121L) in the Norrie disease protein. *Clin.Genet.* 50, 113-115.
- Joos,K.M., Kimura,A.E., Vandenberg,K., Bartley,J.A., and Stone,E.M. (1994). Ocular findings associated with a Cys39Arg mutation in the Norrie disease gene. *Archives of Ophthalmology* 112, 1574-1579.
- Kellner,U., Fuchs,S., Bornfeld,N., Foerster,M.H., and Gal,A. (1996). Ocular phenotypes associated with two mutations (R121W, C126X) in the Norrie disease gene. *Ophthalmic Genet.* 17, 67-74.
- Knierim,J.J. (2003). Hippocampus and memory. Can we have our place and fear it too? *Neuron* 37, 372-374.
- Kourembanas,S., Hannan,R.L., and Faller,D.V. (1990). Oxygen tension regulates the expression of the platelet-derived growth factor-B chain gene in human endothelial cells. *J Clin Invest* 86, 670-674.
- Laemmli,U.K. (1970). Cleavage of structural proteins during the assembly of the head of bacteriophage T4. *Nature* 227, 680-685.
- Landgrebe,J., Welzl,G., Metz,T., van Gaalen,M.M., Ropers,H., Wurst,W., and Holsboer,F. (2002). Molecular characterisation of antidepressant effects in the mouse brain using gene expression profiling. *J.Psychiatr.Res.* 36, 119-129.

- Lang,R.A. and Bishop,J.M. (1993). Macrophages are required for cell death and tissue remodeling in the developing mouse eye. *Cell* 74, 453-462.
- Lenzner,S., Prietz,S., Feil,S., Nuber,U.A., Ropers,H.H., and Berger,W. (2002). Global gene expression analysis in a mouse model for Norrie disease: late involvement of photoreceptor cells. *Invest Ophthalmol.Vis.Sci.* 43, 2825-2833.
- Liao,J., Piwien-Pilipuk,G., Ross,S.E., Hodge,C.L., Sealy,L., MacDougald,O.A., and Schwartz,J. (1999). CCAAT/Enhancer-binding Protein beta (C/EBPbeta ) and C/EBPdelta Contribute to Growth Hormone-regulated Transcription of c-fos. *Journal of Biological Chemistry* 274, 31597-31604.
- Linzer,D.I. and Talamantes,F. (1985). Nucleotide sequence of mouse prolactin and growth hormone mRNAs and expression of these mRNAs during pregnancy. *Journal of Biological Chemistry* 260, 9574-9579.
- Lobie,P.E., Zhu,T., Graichen,R., and Goh,E.L. (2000). Growth hormone, insulin-like growth factor I and the CNS: localization, function and mechanism of action. *Growth Horm.IGF.Res* 10 *Suppl B*, S51-S56.
- Lobie,P.E., Garcia-Aragon,J., Lincoln,D.T., Barnard,R., Wilcox,J.N., and Waters,M.J. (1993). Localization and ontogeny of growth hormone receptor gene expression in the central nervous system. *Developmental Brain Research* 74, 225-233.
- Lupu,F., Terwilliger,J.D., Lee,K., Segre,G.V., and Efstratiadis,A. (2001). Roles of Growth Hormone and Insulin-like Growth Factor 1 in Mouse Postnatal Growth. *Developmental Biology* 229, 141-162.
- Ma,G.T., Roth,M.E., Groskopf,J.C., Tsai,F.Y., Orkin,S.H., Grosveld,F., Engel,J.D., and Linzer,D.I. (1997). GATA-2 and GATA-3 regulate trophoblast-specific gene expression in vivo. *Development* 124, 907-914.
- Maisonpierre,P.C., Suri,C., Jones,P.F., Bartunkova,S., Wiegand,S.J., Radziejewski,C., Compton,D., McClain,J., Aldrich,T.H., Papadopoulos,N., Daly,T.J., Davis,S., Sato,T.N., and Yancopoulos,G.D. (1997). Angiopoietin-2, a Natural Antagonist for Tie2 That Disrupts in vivo Angiogenesis. *Science* 277, 55-60.
- Maquat,L.E. and Carmichael,G.G. (2001). Quality Control of mRNA Function. *Cell* 104, 173-176.
- Mechoulam,H. and Pierce,E. (2003). Retinopathy of prematurity : molecular pathology and therapeutic strategies. *Am.J.Pharmacogenomics.* 3, 261-277.
- Meindl,A., Berger,W., Meitinger,T., van de,P.D., Achatz,H., Dorner,C., Haasemann,M., Hellebrand,H., Gal,A., Cremers,F., and . (1992). Norrie disease is caused by mutations in an extracellular protein resembling C-terminal globular domain of mucins. *Nat.Genet.* 2, 139-143.
- Meindl,A., Lorenz,B., Achatz,H., Hellebrand,H., Schmitz-Valckenberg,P., and Meitinger,T. (1995). Missense mutations in the NDP gene in patients with a less severe course of Norrie disease. *Human Molecular Genetics* 4, 489-490.
- Meitinger,T., Meindl,A., Bork,P., Rost,B., Sander,C., Haasemann,M., and Murken,J. (1993). Molecular modelling of the Norrie disease protein predicts a cystine knot growth factor tertiary structure. *Nat.Genet.* 5, 376-380.
- Mintz-Hittner,H.A., Ferrell,R.E., Sims,K.B., Fernandez,K.M., Gemmell,B.S., Satriano,D.R., Caster,J., and Kretzer,F.L. (1996). Peripheral retinopathy in offspring of carriers of Norrie disease gene mutations. Possible transplacental effect of abnormal Norrin. *Ophthalmology* 103, 2128-2134.
- Mitchell,C.A., Risau,W., and Drexler,H.C. (1998). Regression of vessels in the tunica vasculosa lentis is initiated by coordinated endothelial apoptosis: a role for vascular endothelial growth factor as a survival factor for endothelium. *Dev.Dyn.* 213, 322-333.
- Mudhar,H.S., Pollock,R.A., Wang,C., Stiles,C.D., and Richardson,W.D. (1993). PDGF and its receptors in the developing rodent retina and optic nerve. *Development* 118, 539-552.
- Mullis,K., Faloona,F., Scharf,S., Saiki,R., Horn,G., and Erlich,H. (1986). Specific enzymatic amplification of DNA in vitro: the polymerase chain reaction. *Cold Spring Harb.Symp.Quant.Biol* 51 *Pt 1*, 263-273.

- Noguchi, T. (1996). Effects of growth hormone on cerebral development: morphological studies. *Horm. Res* 45, 5-17.
- Norrie, G. (1927). Causes of blindness in children. *Acta Ophthalmol. (Copenh)* 5, 357-386.
- Nyberg, F. (2000). Growth Hormone in the Brain: Characteristics of Specific Brain Targets for the Hormone and Their Functional Significance\*1. *Frontiers in Neuroendocrinology* 21, 330-348.
- O'Neill, J.P., Rogan, P.K., Cariello, N., and Nicklas, J.A. (1998). Mutations that alter RNA splicing of the human HPRT gene: a review of the spectrum. *Mutat. Res* 411, 179-214.
- Ohlmann, A.V., Adamek, E., Ohlmann, A., and Lutjen-Drecoll, E. (2004). Norrie Gene Product Is Necessary for Regression of Hyaloid Vessels. *Investigative Ophthalmology Visual Science* 45, 2384-2390.
- Ortega, N., Hutchings, H., and Plouet, J. (1999). Signal relays in the VEGF system. *Front Biosci.* 4, D141-D152.
- Ozaki, H., Yu, A.Y., Della, N., Ozaki, K., Luna, J.D., Yamada, H., Hackett, S.F., Okamoto, N., Zack, D.J., Semenza, G.L., and Campochiaro, P.A. (1999). Hypoxia inducible factor-1alpha is increased in ischemic retina: temporal and spatial correlation with VEGF expression. *Invest Ophthalmol Vis. Sci.* 40, 182-189.
- Palmetshofer, A., Zechner, D., Luger, T.A., and Barta, A. (1995). Splicing variants of the human growth hormone mRNA: detection in pituitary, mononuclear cells and dermal fibroblasts. *Molecular and Cellular Endocrinology* 113, 225-234.
- Perez-Vilar, J. and Hill, R.L. (1997). Norrie disease protein (Norrin) forms disulfide-linked oligomers associated with the extracellular matrix. *Journal of Biological Chemistry* 272, 33410-33415.
- Piccolo, S., Agius, E., Leyns, L., Bhattacharyya, S., Grunz, H., Bouwmeester, T., and Robertis, E.M.D. (1999). The head inducer Cerberus is a multifunctional antagonist of Nodal, BMP and Wnt signals. *Nature* 397, 707-710.
- Porath, J., Carlsson, J., Olsson, I., and Belfrage, G. (1975). Metal chelate affinity chromatography, a new approach to protein fractionation. *Nature* 258, 598-599.
- Provis, J.M. (2001). Development of the primate retinal vasculature. *Prog. Retin. Eye Res.* 20, 799-821.
- Rehm, H.L., Gutierrez-Espeleta, G.A., Garcia, R., Jimenez, G., Khetarpal, U., Priest, J.M., Sims, K.B., Keats, B.J., and Morton, C.C. (1997). Norrie disease gene mutation in a large Costa Rican kindred with a novel phenotype including venous insufficiency. *Hum. Mutat.* 9, 402-408.
- Rehm, H.L., Zhang, D.S., Brown, M.C., Burgess, B., Halpin, C., Berger, W., Morton, C.C., Corey, D.P., and Chen, Z.Y. (2002). Vascular defects and sensorineural deafness in a mouse model of Norrie disease. *Journal of Neuroscience* 22, 4286-4292.
- Richter, M., Gottanka, J., May, C.A., Welge-Lussen, U., Berger, W., and Lutjen-Drecoll, E. (1998). Retinal vasculature changes in Norrie disease mice. *Investigative Ophthalmology Visual Science* 39, 2450-2457.
- Robitaille, J., MacDonald, M.L., Kaykas, A., Sheldahl, L.C., Zeisler, J., Dube, M.P., Zhang, L.H., Singaraja, R.R., Guernsey, D.L., Zheng, B., Siebert, L.F., Hoskin-Mott, A., Trese, M.T., Pimstone, S.N., Shastry, B.S., Moon, R.T., Hayden, M.R., Goldberg, Y.P., and Samuels, M.E. (2002). Mutant frizzled-4 disrupts retinal angiogenesis in familial exudative vitreoretinopathy. *Nat. Genet.* 32, 326-330.
- Royer, G., Hanein, S., Raclin, V., Gigarel, N., Rozet, J.M., Munnich, A., Steffann, J., Dufier, J.L., Kaplan, J., and Bonnefont, J.P. (2003). NDP gene mutations in 14 French families with Norrie disease. *Hum. Mutat.* 22, 499.
- Ruether, K., van de, P.D., Jaissle, G., Berger, W., Tornow, R.P., and Zrenner, E. (1997). Retinoschisislike alterations in the mouse eye caused by gene targeting of the Norrie disease gene. *Investigative Ophthalmology Visual Science* 38, 710-718.
- Saiki, R.K., Gelfand, D.H., Stoffel, S., Scharf, S.J., Higuchi, R., Horn, G.T., Mullis, K.B., and Erlich, H.A. (1988). Primer-directed enzymatic amplification of DNA with a thermostable DNA polymerase. *Science* 239, 487-491.

- Sambrook J, Fritsch E.F., and Maniatis T. (1989). *Molecular Cloning - A Laboratory Manual Second Edition*. Cold Spring Harbor Laboratory Press).
- Sanger,F., Nicklen,S., and Coulson,A.R. (1977). DNA sequencing with chain-terminating inhibitors. *Proc Natl.Acad.Sci.U.S.A* 74, 5463-5467.
- Sato,T.N., Tozawa,Y., Deutsch,U., Wolburg-Buchholz,K., Fujiwara,Y., Gendron-Maguire,M., Gridley,T., Wolburg,H., Risau,W., and Qin,Y. (1995). Distinct roles of the receptor tyrosine kinases Tie-1 and Tie-2 in blood vessel formation. *Nature* 376, 70-74.
- Scheepens,A., Sirimanne,E., Beilharz,E., Breier,B.H., Waters,M.J., Gluckman,P.D., and Williams,C.E. (1999). Alterations in the neural growth hormone axis following hypoxic-ischemic brain injury. *Brain Res Mol Brain Res* 68, 88-100.
- Scheepens,A., Sirimanne,E.S., Breier,B.H., Clark,R.G., Gluckman,P.D., and Williams,C.E. (2001). Growth hormone as a neuronal rescue factor during recovery from CNS injury. *Neuroscience* 104, 677-687.
- Schena,M., Heller,R.A., Thériault,T.P., Konrad,K., Lachenmeier,E., and Davis,R.W. (1998). Microarrays: biotechnology's discovery platform for functional genomics. *Trends in Biotechnology* 16, 301-306.
- Schneider,H.J., Pagotto,U., and Stalla,G.K. (2003). Central effects of the somatotrophic system. *Eur.J.Endocrinol.* 149, 377-392.
- Schroeder,B., Hesse,L., Bruck,W., and Gal,A. (1997). Histopathological and immunohistochemical findings associated with a null mutation in the Norrie disease gene. *Ophthalmic Genet.* 18, 71-77.
- Schuback,D.E., Chen,Z.Y., Craig,I.W., Breakefield,X.O., and Sims,K.B. (1995). Mutations in the Norrie disease gene. *Hum.Mutat.* 5, 285-292.
- Senger,D.R., Galli,S.J., Dvorak,A.M., Perruzzi,C.A., Harvey,V.S., and Dvorak,H.F. (1983). Tumor cells secrete a vascular permeability factor that promotes accumulation of ascites fluid. *Science* 219, 983-985.
- Shastry,B.S., Hejtmancik,J.F., and Trese,M.T. (1997a). Identification of novel missense mutations in the Norrie disease gene associated with one X-linked and four sporadic cases of familial exudative vitreoretinopathy. *Hum.Mutat.* 9, 396-401.
- Shastry,B.S., Hiraoka,M., Trese,D.C., and Trese,M.T. (1999). Norrie disease and exudative vitreoretinopathy in families with affected female carriers. *Eur.J.Ophthalmol.* 9, 238-242.
- Shastry,B.S., Liu,X., Hejtmancik,J.F., Plager,D.A., and Trese,M.T. (1997b). Evidence for genetic heterogeneity in X-linked familial exudative vitreoretinopathy. *Genomics* 44, 247-248.
- Shastry,B.S., Pendergast,S.D., Hartzler,M.K., Liu,X., and Trese,M.T. (1997c). Identification of missense mutations in the Norrie disease gene associated with advanced retinopathy of prematurity. *Arch.Ophthalmol.* 115, 651-655.
- Shastry,B.S. and Trese,M.T. (2003). Overproduction and partial purification of the Norrie disease gene product, norrin, from a recombinant baculovirus. *Biochem.Biophys.Res.Commun.* 312, 229-234.
- Shastry,B.S., Hejtmancik,J.F., Plager,D.A., Hartzler,M.K., and Trese,M.T. (1995). Linkage and Candidate Gene Analysis of X-Linked Familial Exudative Vitreoretinopathy. *Genomics* 27, 341-344.
- Shweiki,D., Itin,A., Soffer,D., and Keshet,E. (1992). Vascular endothelial growth factor induced by hypoxia may mediate hypoxia-initiated angiogenesis. *Nature* 359, 843-845.
- Smith,L.E., Wesolowski,E., McLellan,A., Kostyk,S.K., D'Amato,R., Sullivan,R., and D'Amore,P.A. (1994). Oxygen-induced retinopathy in the mouse. *Invest Ophthalmol Vis.Sci.* 35, 101-111.
- Stalmans,I., Ng,Y.S., Rohan,R., Fruttiger,M., Bouche,A., Yuce,A., Fujisawa,H., Hermans,B., Shani,M., Jansen,S., Hicklin,D., Anderson,D.J., Gardiner,T., Hammes,H.P., Moons,L., Dewerchin,M., Collen,D.,

- Carmeliet,P., and D'Amore,P.A. (2002). Arteriolar and venular patterning in retinas of mice selectively expressing VEGF isoforms. *Journal of Clinical Investigation* 109, 327-336.
- Stewart,C.L., Kaspar,P., Brunet,L.J., Bhatt,H., Gadi,I., Kontgen,F., and Abbondanzo,S.J. (1992). Blastocyst implantation depends on maternal expression of leukaemia inhibitory factor. *Nature* 359, 76-79.
- Stone,J., Itin,A., Alon,T., Pe'er,J., Gnessin,H., Chan-Ling,T., and Keshet,E. (1995). Development of retinal vasculature is mediated by hypoxia-induced vascular endothelial growth factor (VEGF) expression by neuroglia. *Journal of Neuroscience* 15, 4738-4747.
- Stone,J. and Maslim,J. (1997). Mechanisms of retinal angiogenesis. *Progress in Retinal and Eye Research* 16, 157-181.
- Strasberg,P., Liede,H.A., Stein,T., Warren,I., Sutherland,J., and Ray,P.N. (1995). A novel mutation in the Norrie disease gene predicted to disrupt the cystine knot growth factor motif. *Hum.Mol Genet* 4, 2179-2180.
- Suh,T.T., Holmback,K., Jensen,N.J., Daugherty,C.C., Small,K., Simon,D.I., Potter,S., and Degen,J.L. (1995). Resolution of spontaneous bleeding events but failure of pregnancy in fibrinogen-deficient mice. *Genes and Development* 9, 2020-2033.
- Tazawa,Y. and Seaman,A.J. (1972). The electroretinogram of the living extracorporeal bovine eye. The influence of anoxia and hypothermia. *Invest Ophthalmol* 11, 691-698.
- Thurston,G., Rudge,J.S., Ioffe,E., Zhou,H., Ross,L., Croll,S.D., Glazer,N., Holash,J., McDonald,D.M., and Yancopoulos,G.D. (2000). Angiopoietin-1 protects the adult vasculature against plasma leakage. *Nat.Med.* 6, 460-463.
- Toomes,C., Bottomley,H.M., Jackson,R.M., Towns,K.V., Scott,S., Mackey,D.A., Craig,J.E., Jiang,L., Yang,Z., Trembath,R., Woodruff,G., Gregory-Evans,C.Y., Gregory-Evans,K., Parker,M.J., Black,G.C., Downey,L.M., Zhang,K., and Inglehearn,C.F. (2004a). Mutations in LRP5 or FZD4 underlie the common familial exudative vitreoretinopathy locus on chromosome 11q. *Am J Hum.Genet.* 74, 721-730.
- Toomes,C., Downey,L.M., Bottomley,H.M., Scott,S., Woodruff,G., Trembath,R.C., and Inglehearn,C.F. (2004b). Identification of a fourth locus (EVR4) for familial exudative vitreoretinopathy (FEVR). *Mol Vis.* 10, 37-42.
- Torrente,I., Mangino,M., Gennarelli,M., Novelli,G., Giannotti,A., Vadala,P., and Dallapiccola,B. (1997). Two new missense mutations (A105T and C110G) in the norrin gene in two Italian families with Norrie disease and familial exudative vitreoretinopathy. *Am J Med Genet* 72, 242-244.
- van Nouhuys,C.E. (1991). Signs, complications, and platelet aggregation in familial exudative vitreoretinopathy. *Am J Ophthalmol* 111, 34-41.
- Vitt,U.A., Hsu,S.Y., and Hsueh,A.J.W. (2001). Evolution and classification of Cystine Knot-containing hormones and related extracellular signaling molecules. *Molecular Endocrinology* 15, 681-694.
- Walker,J.L., Dixon,J., Fenton,C.R., Hungerford,J., Lynch,S.A., Stenhouses,S.A., Christian,A., and Craig,I.W. (1997). Two new mutations in exon 3 of the NDP gene: S73X and S101F associated with severe and less severe ocular phenotype, respectively. *Hum.Mutat.* 9, 53-56.
- Wang,W., Van De Water,T., and Lufkin,T. (1998). Inner ear and maternal reproductive defects in mice lacking the Hmx3 homeobox gene. *Development* 125, 621-634.
- Wang,Y., Huso,D., Cahill,H., Ryugo,D., and Nathans,J. (2001). Progressive Cerebellar, Auditory, and Esophageal Dysfunction Caused by Targeted Disruption of the frizzled-4 Gene. *Journal of Neuroscience* 21, 4761-4771.
- Wang,Z. and Brown,D.D. (1991). A gene expression screen. *Proc Natl.Acad.Sci U.S.A* 88, 11505-11509.
- Warburg,M. (1966). Norrie's disease. A congenital progressive oculo-acoustico-cerebral degeneration. *Acta Ophthalmol.(Copenh) Suppl*-147.



- Warburg,M. (1968). Norrie's disease. *J.Ment.Defic.Res.* 12, 247-251.
- Warburg,M. (1975). Norrie's disease-differential diagnosis and treatment. *Acta Ophthalmol.(Copenh)* 53, 217-236.
- Wingfield,P.T., Sax,J.K., Stahl,S.J., Kaufman,J., Palmer,I., Chung,V., Corcoran,M.L., Kleiner,D.E., and Stetler-Stevenson,W.G. (1999). Biophysical and Functional Characterization of Full-length, Recombinant Human Tissue Inhibitor of Metalloproteinases-2 (TIMP-2) Produced in Escherichia coli. Comparison of Wildtype and Amino-terminal Alanine Appended Variant with Implications for the Mechanism of TIMP functions. *Journal of Biological Chemistry* 274, 21362-21368.
- Witmer,A.N., van Blijswijk,B.C., van Noorden,C.J.F., Vrensen,G.F.J.M., and Schlingemann,R. (2004). In Vivo Angiogenic Phenotype of Endothelial Cells and Pericytes Induced by Vascular Endothelial Growth Factor-A. *Journal of Histochemistry and Cytochemistry* 52, 39-52.
- Wittenberg,G.M. and Tsien,J.Z. (2002). An emerging molecular and cellular framework for memory processing by the hippocampus. *Trends in Neurosciences* 25, 501-505.
- Wong,F., Goldberg,M.F., and Hao,Y. (1993). Identification of a nonsense mutation at codon 128 of the Norrie's disease gene in a male infant. *Archives of Ophthalmology* 111, 1553-1557.
- Xu,Q., Wang,Y., Dabdoub,A., Smallwood,P.M., Williams,J., Woods,C., Kelley,M.W., Jiang,L., Tasman,W., Zhang,K., and Nathans,J. (2004). Vascular development in the retina and inner ear: control by Norrin and Frizzled-4, a high-affinity ligand-receptor pair. *Cell* 116, 883-895.
- Yamada,K., Limprasert,P., Ratanasukon,M., Tengtrisorn,S., Yingchareonpukdee,J., Vasiknanonte,P., Kitaoka,T., Ghadami,M., Niikawa,N., and Kishino,T. (2001). Two Thai families with Norrie disease (ND): association of two novel missense mutations with severe ND phenotype, seizures, and a manifesting carrier. *Am J Med Genet* 100, 52-55.
- Yancopoulos,G.D., Davis,S., Gale,N.W., Rudge,J.S., Wiegand,S.J., and Holash,J. (2000). Vascular-specific growth factors and blood vessel formation. *Nature* 407, 242-248.
- Yayon,A., Klagsbrun,M., Esko,J.D., Leder,P., and Ornitz,D.M. (1991). Cell surface, heparin-like molecules are required for binding of basic fibroblast growth factor to its high affinity receptor. *Cell* 64, 841-848.
- Yoshizato,H., Fujikawa,T., Soya,H., Tanaka,M., and Nakashima,K. (1998). The Growth Hormone (GH) Gene Is Expressed in the Lateral Hypothalamus: Enhancement by GH-Releasing Hormone and Repression by Restraint Stress. *Endocrinology* 139, 2545-2551.
- Zaremba,J., Feil,S., Juszko,J., Myga,W., van Duijnhoven,G., and Berger,W. (1998). Intrafamilial variability of the ocular phenotype in a Polish family with a missense mutation (A63D) in the Norrie disease gene. *Ophthalmic Genet.* 19, 157-164.