5 Literatur

[1] Albeida SM, Daise M, Levine EM, Buck CA: Identification and characterization of cell-substratum adhesion receptors on cultured human endothelial cells. J Clin Invest **83** (1989) 1992-2002

[2] Angus JA, Cocks TM: The half-life of endothelium-derived relaxing factor released from bovine aortic endothelial cells in culture J Physiol **388** (1987) 71-81

[3] Antoni H: Mechanik der Herzaktion. In: Schmidt RF/ Thews G (Hrsg.): Physiologie des Menschen. Springer, Berlin/ Heidelberg/ New York: 27. (1997) 448-71

[4] Assoian RK, Marcantonio EE: The extracellular matrix as a cell cycle control element in atherosclerosis and restenosis. J Clin Invest Dec **1**(1996) 2436-9

[5] Ayajiki K, Kindermann M, Hecker M, Fleming I, Busse R: Intracellular pH and tyrosine phosphorylation but not calcium determine shear stress-induced nitric oxide production in native endothelial cells. Circ Res **78** (1996) 750-8

[6] Barakat AI, Leaver EV, Pappone PA, Davies PF: A flow-activated chloride-selective membrane current in vascular endothelial cells. Circ Res **85** (1999) 820-8

[7] Barbee KA, Davies PF, Lal R: Shear-stress induced reorganization of the surface topography of living endothelial cells imaged by atomic force microscopy. Circ Res **74** (1994) 163-71

[8] Barbee KA, Mundel T, Lal R, Davies PF: Subcellular distribution of shear stress at the surface of flow-aligned and nonaligned endothelial monolayers. Am J Physiol **268** (1995) H1765-1772

[9] Bassenge E, Busse R: Endothelial modulation of coronary tone. Prog Cardiovasc Dis **30** (1988) 349-80

[10] Bassenge E: Flow-dependent regulation of coronary vasomotor tone. Eur Heart J **10** suppl F (1989) 22-7

[11] Bayliss WM: On the local reaction of the arterial wall to changes of internal pressure. J Physiol (Lond.) **28** (1902) 220-31.

[12] Bevan JA, Joyce EH, Wellman GC: Flow-dependent dilation in a resistance artery still occurs after endothelium removal. Circ Res **63** (1988) 980-5

[13] Bevan JA, Laher I: Pressure and flow-dependent vascular tone. FASEB J **5** (1991) 2267-73

[14] Bevan JA, Siegel G: Blood vessel wall matrix flow sensor: evidence and speculation. Blood Vessels **28** (1991) 552-6

[15] Bodin P, Bailey D, Burnstock G: Increased flow-induced ATP-release from isolated vascular endothelial cells but not smooth muscle cells. Br J Pharmacol **103** (1991) 1203-5

[16] Bolotina VM, Najibi S, Palacino JJ, Pagano PJ, Cohen RA: Nitric oxide directly activates calcium-dependent potassium channels in vascular smooth muscle. Nature **368** (1994) 850-3

[17] Boulanger CM, Lüscher TF: Release of endothelin from the porcine aorta: inhibition by endothelium-derived nitric oxide. J Clin Invest **85** (1990) 587-90

[18] Boulanger CM, Vanhoutte PM: G proteins and endothelium-dependent relaxations. J Vasc Res **34** (1997) 175-85

[19] Britten MB, Zeiher AM, Schächinger V: Clinical importance of coronary endothelial vasodilator dysfunction and therapeutic options. J Intern Med **245** (1999) 315-27

[20] Buck CA: Cell surface receptors for extracellular matrix molecules. Annu Rev Cell Biol **3** (1987) 179-205

[21] Burridge K, Mangeat P: An interaction between vinculin and talin. Nature **308** (1984) 744-6

[22] Burridge K: Focal adhesions: transmembrane junctions between the extracellular matrix and the cytoskeleton. Annu Rev Cell Biol **4** (1988) 487-525

[23] Busse R: Mechanisms controlling the production of endothelial autacoids. Z Kardio **6** (1989) 64-9

[24] Chen KD: Mechanotransduction in response to shear stress. Role of receptor tyrosine kinases, integrins and Shc. J Biol Chem **274** (1999) 18393-00

[25] Chen Q, Kinch MS, Lin TH, Burridge K, Juliano RL: Integrin-mediated cell adhesion activates mitogen-activated protein kinases. J Biol Chem **269** (1994) 26602-5

[26] Christensen O: Mediation of cell volume regulation by Ca^{2+} influx through stretch-activated channels. Natue **330** (1987) 66-68

[27] Cizmeci-Smith G. Differential expressions of transmembrane proteoglycans in vascular smooth muscle cells. J Biol Chem **268**, 25 (1993) 18740-7

[28] Cizmeci-Smith G, Langan E, Youkey, Showalter LJ, Carey DJ: Syndecan-4 is a primary-response gene induced by basic fibroblast growth factor and arterial injury in vascular smooth muscle cells. Arterioscler Thromb Vasc Biol **17** (1997) 172-80

[29] Cohen RA, Vanhoutte PM: Endothelium-dependent hyperpolarization. Beyond nitric oxide and cyclic GMP. Circulation **92** (1995) 3337-49

[30] Comper WD, Laurent TC: Physiological function of connective tissue polysaccharides. Physiol Rev **58** (1978) 255-303

[31] Cooke JP, Rossitch E, Andon NA, Loscalzo J, Dzau VJ: Flow activates an endothelial K^+ channel to release an endogenous nitrovasodilator. J Clin Invest **88** (1991) 1663-71

[32] Corson MA, James NL, Latta SE, Nerem RM, Berk BC, Harrison DG: Phosphorylation of endothelial nitric oxide synthase in response to fluid shear stress. Circ Res **79** (1996) 984-991

[33] Couet J, Li S, Okamoto T, Ikezu T, Lisanti MP: Identification of peptide and protein ligands for the caveolin-scaffolding domain. Implications for the interaction of calveolin with caveolae-associated proteins. J Biol Chem **272** (1997) 6525-33

[34] Davies PF, Remuzzi A, Gordon EJ, Dewey CF: Turbulent fluid shear stress induces vascular endothelial cell turnover in vitro. Proc Natl Acad Sci USA **83** (1986) 2114-7

[35] Davies PF: Endothelium as signal transduction interface for flow forces: cell surface dynamics. Thromb Haemostasis **70** (1993) 124-8

[36] Davies PF, Tripathi SC: Mechanical stress mechanisms and the cell. An endothelial paradigm. Circ Res **72** (1993) 239-45

[37] Davies PF, Robotewskyj A, Griem ML: Endothelial cell adhesion in real time. Measurements in vitro by tandem scanning confocal image analysis. J Clin Invest **91** (1993) 2640-52

[38] Davies PF, Robotewskyj A, Griem ML: Quantitative studies of endothelial cell adhesion. Directional remodeling of focal adhesion sites in response to flow forces. J Clin Invest **93** (1994) 2031-38

[39] Davies PF: Flow-mediated endothelial mechanotransduction. Physiol Rev **75** (1995) 519-60

[40] Davis MJ, Donovitz JA, Hood JD: Stretch-activated single channel and whole cell currents in vascular smooth muscle cells. Am J Physiol **262** (1992) C1083-8

[41] Davis MJ, Hill MA: Signaling mechanisms underlying the vascular myogenic response. Physiol Rev **79** (1999) 387-423

[42] De Paola N, Gimbrone MA, Davies PF, Dewey CF: Vascular endothelium responds to fluid shear stress gradients. Arterioscler Thromb **12** (1992) 1254-7

[43] Desjardins C, Duling BR: Heparinase treatment suggests a role for endothelial cell glycocalyx in the regulation of capillary hematocrit. Am J Physiol **258** (1990) SH647-54

[44] Dimmeler S: Shear stress inhibits apoptosis of human endothelial cells. FEBS Lett **399** (1996) 71-4

[45] Douglas SA, Ohlstein EH: Signal transduction mechanisms mediating the vascular actions of endothelin. J Vasc Res **34** (1997) 152-164f

[46] Dull RO, Davies PF: Flow modulation of agonist (ATP)-response (Ca^{2+}) coupling in vascular endothelial cells. Am J Physiol **261** (1991) H149-54

[47] Feigl EO: Coronary physiology. Physiol Rev **63** (1983) 1-205

[48] Fischer R: Bedeutung endothelialer Proteoglykane für die flußabhängige Gefäßregulation von Koronararterien des Menschen. Inaugural-Dissertation (2004), Berlin

[49] Flaherty JT, Pierce JE, Ferrans VJ, Patel DJ, Tucker WK, Fry DL: Endothelial nuclear patterns in the canine arterial tree with particular reference to hemodynamic events. Circ Res **30** (1972) 23-33

[50] Fleisch A: Les reflexes nutritifs ascendants producteurs de dilatation arterielle. Arch Int Physiol **41** (1935) 141-67

[51] Fleming I: Calcium-dependent and –independent activation of the endothelial nitric oxide synthase. J Vasc Res **34** (1997) 165-74

[52] Folkow B: Intravascular pressure as a factor regulating the tone of the small vessels. Acta Physiol. Scand. **17** (1949) 289-310

[53] Frangos JA, Eskin SG, McIntire LV, Ives CL: Flow effects on prostacyclin production by cultured human endothelial cells. Science **227** (1985) 1477-9

[54] Furchgott RF, Zawadzki JV: The obligatory role of endothelial cells in the relaxation of arterial smooth muscle by acetylcholine. Nature **288** (1980) 373-6

[55] Furchgott RF: Evidence supporting the proposal that endothelium-derived relaxing factor is nitric oxide. Thrombosis Research **5** (1987) Suppl. 7, abstr.

[56] Furchgott RF, Vanhoutte PM: Endothelium-derived relaxing and contracting factors. FASEB J **3** (1989) 2007-18

[57] Furcht LT, Wendelschafer-Crabb G: Trypsin-induced coordinate alterations in cell shape, cytoskeleton, and intrinsic membrane structure of contact-inhibited cells. Exp Cell Res **114** (1978) 1-14

[58] Gallis B: Identification of flow-dependent endothelial nitric oxide synthase phosphorylation sites by mass spectrometry and regulation of phosphorylation and NO production by the PI3K inhibitor LY 294002. J Biol Chem **274** (1999) 30101-8

[59] Gaskell WH: On the tonicity of the heart and blood vessels. J Physiol (Lond.) **3** (1881) 48-75

[60] Garcia-Cardena G, Oh P, Liu J, Schnitzer JE, Sessa WC: Targeting of nitric oxide synthase to enothelial cell caveolae via palmitoylation: implications for nitric oxide signaling. Proc Natl Acad Sci USA **93** (1996) 6448-53

[61] Garcia-Roldan JL, Bevan JA: Flow-induced constriction and dilatation of cerebral resistance arteries. Circ Res **66** (1990) 1445-8

[62] Garcia-Roldan JL, Bevan JA: Augemntation of endothelium-independent flow constriction in pial arteries at high intravascular pressures. Hypertension **17** (1991) 870-4

[63] Gimbrone MA, Nagel T, Topper JN: Biomechanical activation: an emerging paradigm in endothelial adhesion biology. J Clin Invest **99** (1997) 1809-13

[64] Gloe T, Riedmayr S, Sohn HY, Pohl U: The 67-kDa laminin-binding protein is involved in shear stress-dependent endothelial nitric-oxide synthase expression. J Biol Chem **274** (1999) 15996-16002

[65] Grabowski EF, Jaffe EA, Weksler BB: Prostacyclin production by cultured endothelial cell monolayers exposed to step increases in shear stress. J Lab Clin Med **105** (1985) 36-43

[66] Griffith TM: The nature of endothelium-derived vascular relaxant factor. Nature **308** (1984) 645-7

[67] Gudi SRP: Fluid flow-induced ras activation is mediated by Gaq in human endothelium cells. FASEB J **11** (1997) A223

[68] Hardingham TE, Fosang AJ: Proteoglycans: Many forms and many functions. FASEB J **6** (1992) 861-70

[69] Harrison DG: Endothelial control of vasomotion and nitric oxide production. Cardiol Clin **14** (1996) 1-15

[70] Harrison DG: Cellular and molecular mechanisms of endothelial cell dysfunction. J Clin Invest **100** (1997) 2153-7

[71] Helmke BP, Goldman RD, Davies PF: Rapid displacement of vimentin intermediate filaments in living endothelial cells exposed to flow. Cirs Res **86** (2000) 745-52

[72] Hilton SM: A peripheral arterial conducting mechanism underlying dilatation of the femoral artery and concerned in functional dilatation of skeletal muscle. J Physiol (Lond.) **149** (1959) 93-111

[73] Hintze TH, Vatner SF: Reactive dilation of large coronary arteries in conscious dogs. Circ Res **54** (1984) 50-7

[74] Hishikawa K, Oemar BS, Yang Z, Lüscher TF: Pulsatile stretch stimulates superoxide production and activates NfkappaB in human coronary smooth muscle. Circ Res **81** (1997) 797-803

[75] Holtz J, Förstermann U, Pohl U, Giesler M, Bassenge E: Flow-dependent, endothelium-mediated dilation of epicardial coronary arteries in conscious dogs: effects of cyclooxygenase inhibition. J Cardiovasc Pharmacol **6** (1984) 1161-9

[76] Holtz J: Peripheral circulation: fundamental concepts, comparative aspects of control in specific vascular sections, and lymph flow. In: Greger R/ Windhorst U (Hrsg.): Comprehensive Human Physiology (Vol.2). Springer-Verlag Berlin (1996)

[77] Horwitz A, Duggan K, Buck C, Beckerle MC, Burridge K: Interaction of plasma membrane fibronectin receptor with talin- a transmembrane linkage. Nature **320** (1986) 531-3

[78] Hsieh HJ, Li NQ, Frangos JA: Shear stress increases endothelial platelet-derived growth factor mRNA levels. Am J Physiol **260** (1991) H642-6

[79] Hynes RO: Integrins: a family of cell surface receptors. Cell **48** (1987) 549-54

[80] Ignarro LJ: Endothelium-derived relaxant factor from pulmonary artery and vein possess pharmacological and chemical properties identical to those of nitric oxide radical. Circ Res **61** (1987) 866-79

[81] Ingber D: Integrins as mechanochemical transducers. Curr Opin Cell Biol **3** (1991) 841-8

[82] Ishida T, Peterson TE, Kovach NL, Berk BC: Integrins modulate fluid shear stress signal transduction in endothelial cells. Abstr. Circulation **92** Suppl.1 (1995) 1-629

[83] Ishida T: MAP kinase activation by flow in endothelial cells. Circ Res **79** (1996) 310-16

[84] Jalali S: Shear stress activates p60src-Ras-MAPK signaling pathways in vascular endothelial cells. Arterioscler Thromb Vasc Biol **18** (1998) 227-34

[85] Jo H: Differential effects of shear stress on ERK 1/ 2 and N-terminal Jun kinase (JNK) in endothelial cells. J Biol Chem **272** (1997) 1395-01

[86] Joki N, Kaname S, Hirakata M, Hori Y, Yamaguchi T, Fujita T, Katoh T, Kurokawa K: Tyrosine.kinase dependent TGF-beta and extracellular matrix expression by mechanical stretch in vascular smooth muscle cells. Hypertens Res **23** (2000) 91-9

[87] Jones TW: Discovery that the veins of the bat's wing (which are furnished with valves) are endowed with rhythmical contractility and that the onward flow of blood is accelerated by each contraction. Philos Trans R Soc Lond **142** (1852) 131-136

[88] Kaiser D, Freyberg MA, Friedl P: Lack of hemodynamic forces triggers apoptosis in vascular endothelial cells. Biochem Biophys Res Commun **231** (1997) 586-90

[89] Kamiya A, Togawa T: Adaptive regulation of wall shear stress to flow change in the canine carotid artery. Am J Physiol **239** (1980) H14-21

[90] Kato M, Wang H, Bernfield M, Gallagher JT, Turnbull JE: Cell surface syndecan-1 on distinct cell types differs in fine structure and ligand binding of its heparan sulfate chains. J Biol Chem **269** (1994) 18881-90

[91] Katsuda S: Atherosclerosis and extracellular matrix. J Atheroscler Thromb **10** (2003) 267-74

[92] Kilpatrick EV, Cocks TM: Evidence for differential roles of nitric oxide (NO) and hyperpolarization in endothelium-dependent relaxation of pig isolated coronary artery. Br J Pharmacol **112** (1994) 557-65

[93] Kim CW, Goldberger OA, Gallo RL, Bernfield M: Members of the syndecan family of heparan sulfate proteoglycans are expressed in distinct cell-, tissue-, and development-specific patterns. Mol Biol Cell **5** (1994) 797-805

[94] Kirkpatrick CJ, Melzner I, Göller T: Comparative effects of trypsin, collagenase and mechanical harvesting on cell membrane lipids studied in monolayer-cultured endothelial cells and a green monkey kidney cell line. Biochim et Biophys Acta **846** (1985) 120-26

[95] Kirpalani A, Park H, Butany J, Johnston KW, Ojha M: Velocity and wall shear stress patterns in the human right coronary artery. J Biomech Eng **121** (1999) 370-5

[96] Kjellén L, Lindahl U: Proteoglycans: Structures and interactions. Annu Rev Biochem **60** (1991) 443-75

[97] Knot HJ, Nelson MT: Regulation of membrane potential and diameter by voltage-dependent K^+ channels in rabbit myogenic cerebral arteries. Am J Physiol **269** (1995) H348-55

[98] Knudsen HL, Frangos JA: Role of cytoskeleton in shear stress-induced endothelial nitric oxide production. Am J Physiol **273** (1997) H347-55

[99] Komuro T, Miwa S, Minowa T, Okamoto Y, Enoki T, Ninomiya H, Zhang XF, Uemura Y, Kikuchi H, Masaki T: The involvement of a novel mechanism distinct from the thrombin receptor in the vasocontraction induced by trypsin. Br J Pharmacol **120** (1997) 851-6

[100] Kramer RH: Extracellular matrix interactions with the apical surface of vascular endothelial cells. J Cell Sci **76** (1985) 1-16

[101] Ku DN, Giddens DP, Zarins CK, Glagov S: Pulsatile flow and atherosclerosis in the human carotid bifurcation. Arteriosclerosis **5** (1985) 293-302

[102] Lansman JB: Endothelial mechanosensors: Going with the flow. Nature **331** (1988) 6156 481-2

[103] Lehoux S, Tedgui A: Signal transduction of mechanical stresses in the vascular wall. Hypertension **32** (1998) 338-345

[104] Ludmer PL, Selwyn AP, Shook TL, Wayne BS, Mudge GH, Alexander RW, Ganz P: Paradoxical vasoconstriction induced by acetylcholine in atherosclerotic coronary arteries. N Engl J Med **315** (1986) 1046-51

[105] Lüscher TF: The endothelium and cardiovascular disease- a complex relation. N Engl J Med **330** (1994) 1081-3

[106] Maher PA, Pasquale EB, Wang JYJ, Singer SJ: Phosphotyrosine-containing proteins are concentrated in focal adhesions and intercellular junctions in normal cells. Proc Natl Acad Sci USA **82** (1985) 6576-80

[107] Malek AM, Gibbons GH, Dzau VJ, Izumo S: Fluid shear stress differentially modulates expression of genes encoding basic fibroblast growth factor and platelet-derived growth factor B chain in vascular endothelium. J Clin Invest **92** (1993) 2013-21

[108] Mali M, Jaakkola P, Arvilommi AM, Jalkanen M: Sequence of human syndecan indicates a novel gene family of integral membrane proteoglycans. J Biol Chem **265** (1990) 6884-9

[109] Martin W: The relationship between inhibitory factor, EDRF, nitrite and nitric oxide. Thrombosis Research **7** (1987) suppl. 7, abstr.

[110] McDonald JA: Receptors for extracellular matrix components. Am J Physiol **257** (1989) L331-7

[111] Michel T, Feron O: Nitric oxide synthases: which, where, how, and why? J Clin Invest **100** (1997) 2146-52

[112] Miyamoto S: Integrin function: molecular hierarchies of cytosceletal and signaling molecules. J Cell Biol **131** (1995) 791-805

[113] Mo M, Eskin SG, Schilling WP: Flow-induced changes in Ca^{2+} signaling of vascular endothelial cells: effects of shear stress and ATP. Am J Physiol **260** (1991) H1698-1707

[114] Mogford JE, Davis GE, Platts SH, Meiniger GA: Vascular smooth muscle $\alpha_v\beta_3$ integrin mediates arteriolar vasodilation in response to RGD peptides. Circ Res **79** (1996) 821-6

[115] Muller JM, Davis MJ, Chilian WM: Integrated regulation of pressure and flow. Cardiovasc Research **32** (1996) 668-78

[116] Muller JM, Chilian WM, Davis MJ: Integrin signaling transduces shear stress-dependent vasodilation of coronary arterioles. Circ Res **80** (1997) 320-6

[117] Murray CD: The physiological principle of minimum work. I. The vascular system and the cost of blood volume. Proc Natl Acad Sci USA **12** (1926) 207-14

[118] Nakayama T, Hirano K, Nishimura J, Takahashi S, Kanaide H: Mechanism of trypsin-induced endothelium-dependet vasorelexation in the porcine coronary artery. Br J Pharmac **134** (2001) 815-26

[119] Niebauer J, Cooke JP: Cardiovascular effects of exercise: role of endothelial shear stress. J Am Coll Cardiol **28** (1996) 1652-60

[120] Nishida K, Harrison DG, Navas JP, Fisher AA, Dockery SP, Uematsu M, Nerem RM, Alexander RW, Murphy TJ: Molecular cloning and characterization of the constitutive bovine aortic endothelial cell nitric oxide synthase. J Clin Invest **90** (1992) 2092-6

[121] Ohno M, Gibbons GH, Dzau VJ, Cooke JP: Shear stress elevates endothelial cGMP: role of a potassium channel and G protein coupling. Circulation **88** (1993) 193-7

[122] Ohno M, Cooke JP, Dzau VJ, Gibbons GH: Fluid shear stress induces endothelial transforming growth factor beta-1 transcription and production: modulation by potassium channel blockade. J Clin Invest **95** (1995) 1363-69

[123] Olesen SP: Haemodynamic shear stress activates a K^+ current in vascular endothelium cells. Nature **33** (1988) 168-70

[124] Ostroumoff A: Experiments on the inhibitory nerves of skin blood vessels. Pflügers Archiv **12** (1868) 219-77

[125] Ott MJ: Chronic in vitro flow promotes ultrastructural differentiation of endothelium cells. Endothelium **3** (1995) 21-30

[126] Palmer RMJ, Ferrige AG, Moncada S: Nitric oxide release accounts for the biological activity of endothelium-derived relaxing factor. Nature **327** (1987) 524-6

[127] Palmer RMJ, Ashton DS, Moncada S: Vascular endothelial cells synthesize nitric oxide from L-arginine. Nature **333** (1988) 664-6

[128] Parent R, Lavallee M: Endothelin-dependent effects limit flow-induced dilation of conductance coronary vessles after blockade of nitric oxide formation in conscious dogs. Cardiovasc Res **14** (2000) 470-7

[129] Peters DG, Zhang XC, Benos PV, Heidrich-O'Hare E, Ferrell RE: Genomic analysis of immediate/ early response to shear stress in human coronary endothelial cells. Physiol Genomics **12** (2002) 25-33

[130] Pohl U, Herlan K, Huang A, Bassenge E: EDRF-mediated stress-induced dilation opposes myogenic vasoconstriction in small rabbit arteries. Am J Physiol **261** (1991) H2016-23

[131] Pollack R, Rifkin D: Actin-containing cables within anchorage-dependent rat embryo cells are dissociated by plasmin and trypsin. Cell **6** (1975) 495-506

[132] Pries AR, Secomb TW, Gaehtgens P: Design principles of vascular beds. Circ Res **77** (1995) 1017-23

[133] Ralevic V, Milner P, Hudlicka O, Kristek F, Burnstock G: Substance P is released from the endothelium of normal and capsaicin-treated rat hind-limb vasculature, in vivo, by increased flow. Circ Res **66** (1990) 1178-83

[134] Rapraeger A, Jalkanen M, Bernfield M: Cell surface proteoglycan associates with the cytoskeleton at the basolateral cell surface of mouse mammary epithelial cells. J Cell Biol **103** (1986) 2683-96

[135] Rasmussen H, Haller H, Takuwa Y, Kelley G, Park S: Messenger Ca^{2+}, protein kinase C, and smooth muscle contraction. Porg Clin Biol Res **327** (1990) 89-106

[136] Resnick N, Collins T, Atkinson W, Bonthron DT, Dewey CF, Gimbrone MA: Platelet-derived growth factor B chain promoter contains a cis-acting fluid shear-stress-responsive element. Proc Natl Acad Sci USA **90** (1993) 4591-5

[137] Resnick N, Gimbrone MA: Hemodynamic forces are complex regulators of endothelial gene expression. FASEB J **9** (1995) 874-82

[138] Resnick N, Yahav H, Schubert S, Wolfovitz E, Shay A: Signalling pathways in vascular endothelium activated by shear stress: relevance to atherosclerosis. Curr Opin Lipidol **11** (2000) 167-77

[139] Rioux V, Landry RY, Bensadoun A: Sandwich immunoassay for the measurement of murine syndecan-4. J Lipid Res **43** (2002) 167-73

[140] Rosenberg R, Shworak NW, Schwartz JJ, Zhang L: Heparan sulfate proteoglycans of the cardiovascular system. L Clin Invest **99** (1997) 2062-70

[141] Ross R: The pathogenesis of atherosclerosis: A perspective for the 1990s. Nature **362** (1993) 801-9

[142] Rubanyi GM, Romero JC, Vanhoutte PM: Flow-induced release of endothelium-derived relaxing factor. Am J Physiol **250** (1986) H1145-9

[143] Rubio R, Ceballos G: Role of the endothelial glycocalyx in dromotropic, inotropic and arrhythmogenic effects of coronary flow. Am J Physiol Heart Circ Physiol **278** (2000) H106-16

[144] Ruoslahti E, Pierschbacher MD: New perspectives in cell adhesion: RGD and integrins. Science **238** (1987) 491-7

[145] Ruoslahti E, Yamaguchi Y: Proteoglycans as modulators of growth factor activities. Cell **64** (1991) 867-9

[146] Saifeddine M, Roy SS, Al-Ani B, Triggle CR, Hollenberg MD: Endothelium-dependent contractile actions of proteinase-activated receptor-2-activating peptides in human umbilical vein: release of a contracting factor via a novel receptor. Br J Pharmacol **125** (1998) 1445-54.

[147] Saunders S, Jalkanen M, O'Farrell S, Bernfield M: Molecular cloning of syndecan, an integral membrane proteoglycan. J Cell Biol **108** (1989) 1547-56

[148] Schächinger V, Zeiher AM: Quantitative assessment of coronary vasoreactivity in humans in vivo: importance of baseline vasomotor tone in atherosclerosis. Circ **92** (1995) 2087-94

[149] Schnitzer JE, Liu J, Oh P: Endothelial caveolae have the molecular transport machinery for vesicle budding, docking, and fusion including VAMP, NSF, SNAP, annexins, and GTPases. J Biol Chem **270** (1995) 14399-404

[150] Schretzenmayr A: Über kreislaufregulatorische Vorgänge an den großen Arterien bei der Muskelarbeit. Arch Exp Pathol **164** (1932) 743-8

[151] Seger R, Krebs EG: The MAPK signaling cascade. FASEB J **9** (1995) 726-35

[152] Shattil S, Ginsberg MH: Integrin signaling in vascular biology. J Clin Invest **100** (1997) 1-5

[153] Siegel G, Malmsten M, Schmidt A: Flow sensing at the endothelial cell membrane-blood interface. J Membr Sci **113** (1996) 101-13

[154] Siegel G: Connective tissue: more than just a matrix for cells. In: Greger R/ Windhorst U (Hrsg.): Comprehensive Human Physiology (vol. 1). Springer-Verlag, Berlin (1996)

[155] Siegel G, Walter A, Kauschmann A, Malmsten M, Buddecke E: Anionic biopolymers as blood flow sensors. Biosensors Bioelectronics **11** (1996) 281-94

[156] Siegel G, Malmsten M, Klüßendorf D, Hofer HW: The role of the endothelium in inflammation and tumor metastasis. Int J Microcirc **17** (1997) 257-72

[157] Siegel G, Malmsten M, Lindman B: Flow-sensing at the endothelium-blood interface. Colloids Surfaces (A: Physicochemical and Engineering Aspects) **138** (1998) 345-51

[158] Siegel G, Malmsten M, Klüßendorf D, Leonhard W: Physicochemical binding properties of the proteoglycan receptor for serum lipoproteins, Atherosclerosis **144** (1999) 59-67

[159] Siegel G, Malmsten M, Fischer R, Meyer-Rath G, Hiemann N, Hetzer R: The role of the proteoglycan receptor in lipoprotein binding. Int J Angiol **12** (2003) 78-84

[160] Slack SM, Cui Y, Turitto VT: The effects of flow on blood coagulation and thrombosis. Thrombosis Haemostasis **70** (1993) 129-34

[161] Somlyo AV, Somlyo AP: Electromechanical and pharmacomechanical coupling in vascular smooth muscle. J Pharmacol Exp Ther **159** (1968) 129-45

[162] Stary HC, Chandler AB, Dinsmore RE, Fuster V, Glagov S, Insull W, Rosenfeld ME, Schwartz CJ, Wagner WD, Wissler RW: A definition of advanced types of atherosclerotic lesions and a histological classification of athersclerosis. Circ **92** (1995) 1355-74

[163] Stewart DJ, Pohl U, Bassenge E: Free radicals inhibit endothelium-dependent dilation in the coronary resistance bed. Am J Physiol **255** (1988) H765-9

[164] Strony J, Beaudoin A, Brands D, Adelman B: Analysis of shear stress and hemodynamic factors in a model of coronary artery stenosis and thrombosis. Am J Physiol **265** (1993) H1787-96

[165] Suárez J, Rubio R: Regulation of glycolytic flux by coronary flow in guinea pig heart. Role of vascular endothelial cell glycocalyx. Am J Physiol **261** (1991) H1994-2000

[166] Thoumine O, Nerem RM, Girard PR: Oscillatory shear stress and hydrostatic pressure modulate cell-matrix attachment proteins in cultured endothelial cells. In Vitro Cell Dev Biol Animal **31** (1995) 45-54

[167] Thoumine O: Changes in organization and composition of the extracellular matrix underlying culured endothelial cells exposed to laminar shear stress. Lab Invest **73** (1995) 565-76

[168] Traub O, Berk BC: Laminar shear stress. Mechanisms by which endothelial cells transduce an atheroprotective force. Arterioscler Thromb Vasc Biol **18** (1998) 677-85

[169] Traub O, Ishida T, Ishida M, Tupper JC, Berk BC: Shear stress-mediated extracellular signal-regulated kinase activation is regulated by sodium in endothelial cells. Potential role for a voltage-dependent sodium channel. J Biol Chem **274** (1999) 20144-50

[170] Tsao PS, Buitrago R, Chan JR, Cooke JP: Fluid flow exhibits endothelial adhesiveness: nitric oxide and transcriptional regulation of VCAM-1. Circulation **94** (1996) 1682-9

[171] Tseng H, Peterson TE, Berk BC: Fluid shear stress stimulates mitogen-activated protein kinase in endothelial cells. Circ Res **81** (1995) 896-903

[172] Uematsu M, Ohara Y, Navas JP, Nishida K, Murphy TJ, Alexander RW, Nerem RM, Harrison DG: Regulation of endothelial cell nitric oxide synthase mRNA expression by shear stress. Am J Physiol **269** (1995) C1371-8

[173] Urakami-Harasawa I: Importance of EDHF in human arteries. J Clin Invest **100** (1997) 2793-99

[174] Vanhoutte PM: Endothelium and control of vascular function: State of the art lecture. Hypertension **13** (1989) 658-67

[175] Vequaud P, Freslon JL: Components of flow-induced dilation in rat perfused coronary artery. Cell Biol Toxicol **12** (1996) 227-32

[176] Vequaud P, Pourageaud F, Freslon JL: Role of nitric oxide and endothelium in the flow-induced dilation of rat coronary arteries under two preconstriction conditions. Clin Exp Pharmacol Physiol **26** (1999) 470-6

[177] Vita JA, Treasure CB, Yeung AC, Vekshtein VI, Fantasia GM, Fish RD, Ganz P, Selwyn AP: Patients with evidence of coronary endothelial dysfunction as assessed by acetylcholine infusion demonstrate marked increase in sensitivity to constrictor effects of catecholamines. Circ **85** (1992) 1390-7

[178] Vyalov S, Langille BL, Gotlieb AI: Decreased blood flow rate disrupts endothelial repair in vivo. Am J Pathol **149** (1996) 2107-18

[179] Wang N, Butler JP, Ingber DE: Mechanotransduction across the cell surface and through the cytoskeleton. Science **260** (1993) 1124-7

[180] Watson PA: Function follows form: generation of intracellular signals by cell deformation. FASEB J **5** (1991) 2013-9

[181] Weisberg H: Influence of coronary flow upon oxygen consumption and cardiac performance. Circ Res **13** (1963) 522-8

[182] Yanagisawa M, Kurihara H, Kimura S, Tomobe Y, Kobayashi M, Mitsui Y, Yazaki Y, Goto K, Masaki T: A novel potent vasoconstrictor peptide produced by vascular endothelial cells. Nature **332** (1988) 411-5

[183] Yang F, Zhao P, Zhang Y, Han X, Yang R, Liang F, Wu Y, Zhao H, Zhang Z: Relationship between chondroitin sulfate proteoglycan and coronary atherosclerosis in the youth. Chin Med J (Engl) **109** (1996) 162-7

[184] Zeiher AM, Drexler H, Wollschlaeger H, Saurbier B, Just H: Coronary vasomotion in response to sympathetic stimulation in humans: Importance of the functional integrity of the endothelium. J Am Coll Cardiol **14** (1989) 1181-90

[185] Zeiher AM, Drexler H, Wollschlaeger H, Just H: Modulation of coronary vasomotor tone in humans: progressive endothelial dysfunction with different early stages of coronary atherosclerosis. Circulation **83** (1991) 391-401

[186] Zeiher AM, Drexler H, Saurbier B, Just H: Endothelium-mediated coronary blood flow modulation in humans. Effects on age, atherosclerosis, hypercholesterolemia, and hypertension. J Clin Invest **92** (1993) 652-62

[187] Zeiher AM, Schächinger V, Minners J: Long-term cigarette smoking impairs endothelium-dependent coronary arterial vasodilator function. Circ **92** (1995) 1094-100

[188] Zhao SM, Suciu A, Ziegler T, Moore JE, Bürki E, Meister JJ, Brunner HR: Synergistic effects of fluid shear stress and cyclic cirumferential stretch on vascular endothelial cell morphology and cytoskeleton. Arterioscler Thromb **15** (1995) 1781-6

[189] Ziegler T: Synergistic effects of shear stress, cyclic stretch and pressure on endothelial cell NOS and ET-1 mRNA in endothelial cells. J Vasc Res **33** (1996) 31 (Abstr.)