

CMRC PUBLICATIONS 2000

I. Skeletal muscle – fibre type and metabolic differentiation, including diseases

I. Original Articles

Andersen JL, Aagaard P. Myosin heavy chain IIx overshoot in human skeletal muscle. *Muscle & Nerve* 23, 1095-1104, 2000.

Daugaard JR, Nielsen JN, Kristiansen S, Andersen JL, Hargreaves M, Richter EA. Fiber type-specific expression of GLUT4 in human skeletal muscle. *Diabetes* 49, 1092-1095, 2000.

Koskinen S, Kjær M, Mohr T, Biering-Sørensen F, Suuronen T, Takala T. Type IV collagen and its degradation in paralyzed human muscle: effect of functional electrical stimulation. *Muscle and Nerve* 23, 580-589, 2000.

Lange K, Isaksson F, Lorentsen J, Bülow j, Kjær M. Growth hormone enhances effects of endurance training on oxidative muscle metabolism in elderly women. *Am J Physiol*, E989-996, 2000.

Pilegaard H, Ordway GA, Saltin B, Neufer PD. Transcriptional regulation of gene expression in human skeletal muscle during recovery from exercise. *Am J Physiol* 279, E806-E814, 2000.

I. Reviews, Book Chapters, Symposia Contributions, etc.

Vissing J. Exercise testing in muscle disease. In: *Muscle disease, teaching course 7*. Argov Z, Bushby K (eds.). ENS, Jerusalem, 45-65, 2000.

I. Knowledge dissemination

Andersen JL, Schjerling P, Saltin B. Muscle, genes and athletic performance. *Sci Am* 283, 48-55, 2000.

Vissing J. Diagnostik af muskelsygdomme. *UfL* 162, 2173-2177, 2000.

II a. Metabolism

II a. Original Articles

Boppart MD, Asp S, Wojtaszewski JFP, Fielding RA, Mohr T, Goodyear LJ. Marathon running transiently increases c-Jun NH₂-terminal kinase and p38 γ activities in skeletal muscle. *J Physiol* 526, 663-669, 2000.

Dean D, Daugaard JR, Young ME, Saha A, Vavvas D, Asp S, Kiens B, Kim K-H, Witters L, Richter EA, Ruderman N. Exercise diminishes the activity of acetyl-CoA carboxylase in human muscle. *Diabetes* 49, 1295-1300, 2000.

Dela F, Stallknecht B, Biering-Sørensen F. An intact central nervous system is not necessary for insulin-mediated increases in leg blood flow in humans. *Eur J Physiol*, 444, 241-250, 2000.

Derave W, Ai H, Ihlemann J, Witters LA, Kristiansen S, Richter EA, Ploug T. Dissociation of AMP-activated protein kinase activation and glucose transport in contracting slow-twitch muscle. *Diabetes* 49, 1281-1287, 2000.

Derave W, Gao S, Richter EA. Pro- and macroglycogenolysis in contracting rat skeletal muscle. *Acta Physiol Scand* 169, 291-296, 2000.

Derave W, Hansen BF, Lund S, Kristiansen S, Richter EA. Muscle glycogen content affects insulin-stimulated glucose transport and protein kinase B activity. *Am J Physiol* 279, E947-955, 2000.

Eldrup E, Richter EA. DOPA, dopamine, and DOPAC concentrations in the rat gastrointestinal tract decrease during fasting. *Am J Physiol* 279, E815-E822, 2000.

Enevoldsen LH, Stallknecht B, Fluckey JD, Galbo H. Effect of exercise training on in vivo insulin-stimulated glucose uptake in intra-abdominal adipose tissue in rats. *Am J Physiol* 278, E25-E34, 2000.

Enevoldsen LH, Stallknecht B, Fluckey JD, Galbo H. Effect of exercise training on in vivo lipolysis in intra-abdominal adipose tissue in rats. *Am J Physiol* 279, E585-E592, 2000.

Graham TE, Helge JW, MacLean DA, Kiens B, Richter EA. Caffeine ingestion does not alter carbohydrate or fat metabolism in human skeletal muscle during exercise. *J Physiol* 529, 837-847, 2000.

Hall Gv, Shirreffs SM, Calbet JAL. Muscle glycogen resynthesis during recovery from cycle exercise: no effect of additional protein ingestion. *J Appl Physiol* 88, 1631-1636, 2000.

Hansen BF, Derave W, Jensen P, Richter EA. No limiting role for glycogenin in determining maximal attainable glycogen levels in rat skeletal muscle. *Am J Physiol*, E398-E404, 2000.

Ide K, Schmalbruch IK, Quistorff B, Horn A, Secher NH. Lactate, glucose and O₂ uptake in human brain during recovery from maximal exercise. *J Physiol* 522, 159-164, 2000.

Ihlemann J, Ploug T, Hellsten Y, Galbo H. Effect of stimulation frequency on contraction induced glucose transport in rat skeletal muscle. *Am J Physiol* 279, E862-867, 2000.

Kjær M, Howlett K, Langfort J, Zimmerman-Belsing T, Lorentsen J, Bülow J, Ihlemann J, Feldt-Rasmussen U, Galbo H. Adrenaline and glycogenolysis in skeletal muscle during exercise: a study in adrenalectomised humans. *J Physiol* 528, 371-378, 2000.

Kristiansen S, Gade J, Wojtaszewski JF, Kiens B, Richter EA. Glucose uptake is increased in trained vs. untrained muscle during heavy exercise. *J Appl Physiol* 89, 1151-1158, 2000.

Langfort J, Ploug T, Ihlemann J, Holm C, Galbo H. Stimulation of hormone-sensitive lipase activity by contractions in rat skeletal muscle. *Biochem J* 351, 207-214, 2000.

Lundby C, Saltin B, Van Hall G. The “lactate paradox”, evidence for a transient change in the course of acclimatization to severe hypoxia in lowlanders. *Acta Physiol Scand* 170, 265-269, 2000.

Stallknecht B, Larsen JJ, Mikines KJ, Simonsen L, Bülow J, Galbo H. Effect of training on insulin sensitivity of glucose uptake and lipolysis in human adipose tissue. *Am J Physiol* 279, E376-E385, 2000.

Wojtaszewski JFP, Hansen BP, Gade J, Kiens B, Markuns J, Goodyear LJ, Richter EA. Insulin signaling and insulin sensitivity following exercise in human skeletal muscle. *Diabetes* 49, 325-331, 2000.

Wojtaszewski JFP, Nielsen P, Hansen BF, Richter EA, Kiens B. Isoform specific and exercise intensity dependent activation of 5'AMP-activated protein kinase in human skeletal muscle. *J Physiol* 528, 221-226, 2000.

II a. Reviews, Book Chapters, Symposia Contributions, etc.

Helge J, Gerrit Van Hall, Saltin B. Muscle metabolic factors decisive for marathon running, In: *Marathon Medicine*, Pedoe DT (ed.), The Royal Society of Medicine Press Ltd., London, 67-85, 2000.

Ide K, Secher NH. Cerebral blood flow and metabolism during exercise. *Progress in Neurobiology* 61, 397-414, 2000.

Kjær M, Lange K. Adrenergic regulation of energy metabolism. In: *Sports endocrinology (vol) for contemporary endocrinology*. Warren MP (ed.). M.P. Humana Press, 181-189, 2000.

II a. Knowledge dissemination

Dela F, Vaag AA. Fysisk træning til behandlingen af type 2-diabetes. *UfL* 162, 2185-2189, 2000.

Pedersen BK. Muskulaturen – et overset organ. *Leder. UfL* 162, 2157, 2000.

Richter EA. Kreatin – et præstationsfremmende kosttilskud med medicinsk interesse. *UfL* 162, 2200-2204, 2000.

Saltin B. Om at udfordre et dogme – højdeforskning med forviklinger. *UfL* 162, 6962-6966, 2000.

Saltin B, Helge JW. Skeletmuskulaturens metaboliske kapacitet og sundhed. *UfL* 162, 2159-2164, 2000.

Saltin B, Helge JW. Skelettmuskulatur, körperliche Aktivität und Gesundheit. *Orthopäde* 29, 941-947, 2000.

Saltin B, Lundby C, Hall Gv. Do not challenge a dogma; about explaining the lactate paradox. *Blood Gas News* 9, 37-40, 2000.

Stallknecht BM, Galbo H. Fysisk aktivitet og fedme. *UfL* 162, 2170-2172, 2000.

II b. Nucleotides, electrolytes, and pH regulation

II b. Original Articles

Juel C. Expression of the Na/H exchanger isoform NHE1 in rat skeletal muscle and effect of training. *Acta Physiol Scand* 170, 59-63, 2000.

Juel C, Nielsen JJ, Bangsbo J. Exercise-induced translocation of Na⁺-K⁺ pump subunits to the plasma membrane in human skeletal muscle. *Am J Physiol* 278, R1107-1110, 2000.

Juel C, Pilegaard H, Nielsen JJ, Bangsbo J. Interstitial K⁺ in human skeletal muscle during and after dynamic graded exercise determined by microdialysis. *Am J Physiol* 278, R400-R406, 2000.

Ørtenblad N, Lunde PK, Levin K, Andersen JL, Pedersen PK. Enhanced sarcoplasmic reticulum Ca²⁺ release following intermittent sprint training. *Am J Physiol* 279, 152-160, 2000.

II b. Reviews, Book Chapters, Symposia Contributions, etc.

Hall Gv. Lactate as a fuel for mitochondrial respiration. *Acta Physiol Scand* 168, 643-656, 2000.

II b. Knowledge dissemination

II c. Immune response (cytokines)

II c. Original Articles

Jonsdottir IH, Schjerling P, Ostrowski K, Asp S, Richter EA, Pedersen BK. Muscle contractions induce interleukin-6 mRNA production in rat skeletal muscles. *J Physiol (London)* 528, 157-163, 2000.

Ostrowski K, Schjerling P, Pedersen BK. Physical activity and plasma interleukin-6 in humans – effect of intensity of exercise. *Eur J Appl Physiol* 83, 512-515, 2000.

Pedersen BK, Helge JW, Richter EA, Rohde T, Kiens B. Training and natural immunity: effects of diets rich in fat or carbohydrate. *Eur J Appl Physiol* 82, 98-102, 2000.

Steensberg A, Hall Gv, Osada T, Sacchetti M, Saltin B, Pedersen BK. Production of IL-6 in contracting human skeletal muscles can account for the exercise-induced increase in plasma IL-6. Rapid rapport, *J Physiol (London)* 529, 237-242, 2000.

Søndergaard SR, Ostrowski K, Ullum H, Pedersen BK. Changes in plasma levels of IL-6 and IL-1ra in response to adrenaline. *Eur J Appl Physiol* 83, 95-98, 2000.

Toft AD, Ostrowski K, Asp S, Møller K, Iversen S, Hermann C, Søndergaard SR, Pedersen BK. N-3 PUFA do not affect cytokine response to strenuous exercise. *J Appl Physiol* 89, 2401-2405, 2000.

II c. Reviews, Book Chapters, Symposia Contributions, etc.

Bruunsgaard H, Pedersen BK. Effects of exercise on the immune system in the elderly population. *Immunol Cell Biol* 78, 532-535, 2000.

Pedersen BK. Exercise and cytokines. *Immunol Cell Biol* 78, 532-535, 2000.

Pedersen BK. Prolonged exercise and the immune system. In: *Marathon Medicine*, Pedoe DT (ed.), The Royal Society of Medicine Press Ltd., London, 246-259, 2000.

Pedersen BK, Bruunsgaard H, Ostrowski K, Krabbe K, Hansen H, Krzywkowski K, Toft AD, Søndergaard SR, Petersen EW, Ibfelt T, Schjerling P. Cytokines in aging and exercise. *Int J Sports Med* 21, S4-S9, 2000.

Pedersen BK, Hoffman-Goetz L. Exercise and the immune system: regulation, integration, and adaptation. *Physiol Rev* 80, 1055-1081, 2000.

Pedersen BK, Nieman DC. Exercise, immune function and nutrition - summary and future perspectives in nutrition and exercise immunology. Nieman D, Pedersen BK (eds.). CRC Press, 175-187, 2000.

Pedersen BK, Toft AD. Effects of exercise on lymphocytes and cytokines. *Br J Sports Med* 34, 246-251, 2000.

Rohde T, Ostrowski K, Pedersen BK. Glutamine, exercise and the immune system in nutrition and exercise immunology. Nieman D, Pedersen BK (eds.). CRC Press, 93-108, 2000.

II c. Knowledge dissemination

Pedersen BK. Fysisk aktivitet og immunsystemet – en stressmodel. *UfL* 162, 2181-2185, 2000.

III. Cardiovascular regulation, oxygen uptake, and mitochondrial respiration

III. Original Articles

Bangsbo J, Krstrup P, González-Alonso J, Boushel R, Saltin B. Muscle oxygen kinetics at onset of intense dynamic exercise in humans. *Am J Physiol* R899-R906, 2000.

Boushel R, Langberg H, Green S, Bülow J, Skovgaard D, Kjær M. Blood flow and oxygenation in peritendinous tissue and calf muscle during dynamic exercise in humans. *J Physiol* 524, 305-313, 2000.

Ferguson R, Aagaard P, Ball D, Sargeant AJ, Bangsbo J. Total power output generated during dynamic knee-extensor exercise at different contraction frequencies. *J Appl Physiol* 89, 1912-1918, 2000.

Frandsen U, Bangsbo J, Langberg H, Saltin B, Hellsten Y. Inhibition of nitric oxide synthesis by systemic infusion of NG-monomethol-L-arginine administration in humans: effects on interstitial adenosine, prostacyclin and potassium concentrations in resting and contracting skeletal muscle. *J Vasc Res* 37, 297-302, 2000.

Frandsen U, Höffner L, Betak A, Saltin B, Bangsbo J, Hellsten Y. Endurance training does not alter the level of neuronal nitric oxide synthase (nNOS) in human skeletal muscle. *J Appl Physiol* 89, 1033-1038, 2000.

González-Alonso J, Quistorff B, Krstrup P, Bangsbo J, Saltin B. Heat production in human skeletal muscle at the onset of intense dynamic exercise. *J Physiol* 524, 603-615, 2000.

Green S, Langberg H, Skovgaard D, Bülow J, Kjær M. Interstitial and arterial-venous [K⁺] in human calf muscle during dynamic exercise: effect of ischaemia and relation to muscle pain. *J Physiol* 529, 849-861, 2000.

Hansen J, Sander M, Hald CF, Victor RG, Thomas GD. Metabolic modulation of sympathetic vasoconstriction in human skeletal muscle: role of tissue hypoxia. *J Physiol* 527, 387-396, 2000.

Ide K, Boushel RB, Møller-Sørensen H, Fernandes A, Cai Y, Pott F, Secher NH. Middle cerebral artery blood velocity during exercise with beta-1 adrenergic and unilateral stellate ganglion blockade in humans. *Acta Physiol Scand* 170, 33-38, 2000.

Lynge J, Hellsten Y. Distribution of A1, A2a, and A2b adenosine receptors in human skeletal muscle. *Acta Physiol Scand* 169, 283-290, 2000.

Rådegran G, Saltin B. Human femoral artery diameter in relation to knee extensor muscle mass, peak blood flow, and oxygen uptake. *Am J Physiol*, H162-H167, 2000.

Sander M, Chavoshan B, Harris SA, Iannaccone ST, Stull JT, Thomas GD, Victor RG. Functional muscle ischemia in neuronal NOS-deficient skeletal muscle of children with Duchenne muscular dystrophy. *Proc Natl Acad Sci USA* 97, 13818-13823, 2000.

III. Reviews, Book Chapters, Symposia Contributions, etc.

Bangsbo J. Muscle oxygen uptake in humans at onset of and during intense exercise. *Acta Physiol Scand* 168, 457-464, 2000.

Calbet JAL. Oxygen tension and content in the regulation of limb blood flow. *Acta Physiol Scand* 168, 465-472, 2000.

Hansen J, Sander M, Thomas GD. Metabolic modulation of sympathetic vasoconstriction in exercising skeletal muscle. *Acta Physiol Scand* 168, 489-503, 2000.

Rådegran G, Hellsten Y. Adenosine and nitric oxide in exercise-induced human skeletal muscle vasodilation. *Acta Physiol Scand* 168, 575-591, 2000.

Saltin B. Introduction to the *Acta Physiologica Scandinavica* International Symposium on Skeletal Muscle Oxygen Availability and Utilization. *Acta Physiol Scand* 168, 443-444, 2000.

Saltin B. Role of Haemoglobin, altitude training, and exposure to hypoxia for sea level performance in endurance events. In: *Marathon Medicine*, Pedoe DT (ed.), The Royal Society of Medicine Press Ltd., London, 122-132, 2000.

III. Knowledge dissemination

Boushel RC, Calbet JAL, Rådegran G, Søndergaard H, Wagner PD, Saltin B. Parasympathetic neural control of heart rate and cardiac output in chronic hypoxia. *Blood Gas News* 9, 14-17, 2000.

Kaijser L, Roach RC. Myocardial oxygen extraction after two months of adaptation to high altitude. *Blood Gas News* 9, 11-13, 2000.

Møller K, Paulson OB, Hornbein TF, Colier WN, Roach RC, Knudsen GM. Unchanged cerebral blood flow and oxidative metabolism after acclimatization to high altitude. *Blood Gas News* 9, 31-35, 2000.

Saltin B, Søndergaard H, Zacho M, Hall Gv, Calbet JAL. Blood gases, acid-base balance, muscle mass, and exercise capacity at the upper tolerable limit for humans of acute and chronic hypoxia. *Blood Gas News* 9, 6-10, 2000.