

# Prof. Dr. Natalie Bäcker

## Publikationsliste

### Publikationen in Fachzeitschriften (ab 2003)

Austermann, K., **Baecker, N.**, Zwart, S.R., Fimmers, R., Frippiat, J.P., Stehle, P., Smith, S.M., Heer M. (2021): Antioxidant supplementation does not affect bone turnover markers during 60 days of 6° head-down tilt bed rest: Results from an exploratory randomized controlled trial. *The Journal of Nutrition*. 151(6), S. 1527-1538

Austermann, K., **Baecker, N.**, Stehle, P, Heer M. (2019): Putative Effects of Nutritive Polyphenols on Bone Metabolism in vivo – evidence from human studies. *Nutrients*; 11 (4): 871.

Frings-Meuthen P, Bernhardt G, Buehlmeier J, **Baecker N**, May F, Heer M., (2018) The negative effect of unloading exceeds the bone-sparing effect of alkaline supplementation: a bed rest study. *Osteoporos Int*. 2018 Sep 25. doi: 10.1007/s00198-018-4703-6.

Crucian BE, Choukèr A, Simpson RJ, Mehta S, Marshall G, Smith SM, Zwart SR, Heer M, Ponomarev S, Whitmire A, Frippiat JP, Douglas GL, Lorenzi H, Buchheim JI, Makedonas G, Ginsburg GS, Ott CM, Pierson DL, Krieger SS, Baecker N, Sams C. (2018) Immune System Dysregulation During Spaceflight: Potential Countermeasures for Deep Space Exploration Missions. *Front Immunol*. 2018 Jun 28;9:1437

Rudwill F, O'Gorman D, Lefai E, Chery I, Zahariev A, Normand S, Pagano AF, Chopard A, Damiot A, Laurens C, Hodson L, Canet-Soulas E, Heer M, Meuthen PF, Buehlmeier J, Baecker N, Meiller L, Gauquelin-Koch G, Blanc S, Simon C, Bergouignan A. (2018) Metabolic Inflexibility Is an Early Marker of Bed-Rest-Induced Glucose Intolerance Even When Fat Mass Is Stable. *J Clin Endocrinol Metab*. 2018 May 1;103(5):1910-1920. doi: 10.1210/jc.2017-02267.

Heer M, Baecker N, Frings-Meuthen P, Graf S, Zwart S, Biolo G, Smith SM (2017). Effects of high protein intake on bone turnover in long term bedrest in women. *Appl Physiol Nutr Metab*. May; 42(5):537-546

Belavý DL, **Baecker N**, Armbrecht G, Beller G, Buehlmeier J, Frings-Meuthen P, Rittweger J, Roth HJ, Herr M, Felsenberg D (2016.) Serum sclerostin and DKK1 in relation to exercise against bone loss in experimental bed rest. *J Bone Miner Metab*, May; 34 (3):354-65.

Heer M, **Baecker N**, Wnendt S, Fischer A, Biolo G, Frings-Meuthen P (2014). How fast is recovery of impaired glucose tolerance after 21 days bed rest (NUC study) in healthy adults?, *The Scientific World Journal*; March 11, 1-7.

Frings-Meuthen P, Boehme G, Liphardt AM, **Baecker N**, Heer M, Rittweger J (2013). Sclerostin and DKK1 levels during 14 and 21 days of bed rest in healthy young men. *J Musculoskelet Neuronal Interact*; 13(1):45-52

**Baecker N**, Frings-Meuthen P, Mester J, Heer M, Liphardt AM (2012). Effects of vibration training on bone metabolism: Results from a short-term bed rest study. *Eur J Appl Physiol*; 112, 5: 1741-1750.

Frings-Meuthen P, Buehlmeier J, **Baecker N**, Stehle P, Fimmers R, May F, Kluge G, Heer M. High Sodium Chloride Intake Exacerbates Immobilization-Induced Bone Resorption and Protein Losses (2011). *J Appl Physiol* (1985). 2011 Aug;111(2):537-42.

**Baecker N**, Frings-Meuthen P, Smith S, Heer M (2009). Short-term high dietary calcium intake during bed rest has no effect on markers of bone turnover in healthy men. *Nutrition*. 2010 May; 26(5):522-7.

Liphardt AM, Mündermann A, Koo S, **Baecker N**, Andriacchi TP, Zange J, Mester J, Heer M (2009). Vibration training intervention to maintain cartilage thickness and serum concentrations of cartilage oligomeric matrix protein (COMP) during immobilization. *Osteoarthritis Cartilage*. 2009 Dec;17(12):1598-603.

Heer M, Frings-Meuthen P, Titze J, Boschmann M, Frisch S, **Baecker N**, Beck L (2009). Increasing sodium intake from a previous low or high intake affects water, electrolyte and acid-base balance differently. *British Journal of Nutrition*, May; 101(9):1286-94.

Smith S, Zwart S, Heer M, Baecker N, Evans H, Feiveson A, Shackelford L, LeBlanc A (2009). Effects of artificial gravity during bed rest on bone metabolism in humans, *J Appl Physiol* Jul; 107(1):47-53.

Fricke O, **Baecker N**, Heer M, Tuttlewski B, Schoenau E (2008). The effect of L-arginine administration on muscle force and power in postmenopausal women. *Clin Physiol Funct Imaging*. Sep; 28(5): 307-11.

Frings-Meuthen P, **Baecker N**, Heer M (2008). Low-grade metabolic acidosis may be the cause of sodium chloride-induced exaggerated bone resorption. *J Bone Miner Res*. Apr;23(4):517-24.

Smith SM, Zwart SR, Heer M, Lee SM, **Baecker N**, Meuche S, Macias BR, Shackelford LC, Schneider S, Hargens AR (2008). WISE-2005: supine treadmill exercise within lower body negative pressure and flywheel resistive exercise as a countermeasure to bed rest-induced bone loss in women during 60-day simulated microgravity. *Bone*, Mar;42(3):572-81.

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## **Buchbeiträge**

Heer M, Titze J, Smith SM, **Baecker N**. *Nutrition Physiology and Metabolism in Spaceflight and Analog Studies*; Springer Briefs in Space Lifescience, Verlag: Springer Berlin Heidelberg; in print, publication date: August 2015 ISBN : 978-3-319-18520-0

Heer M, **Baecker N**, Zwart SR, Smith SM. Preventive, Diagnostic and Therapeutic Strategies for extreme professional activities associated with high stress: Manned Space Flight, Countermeasures: Nutrition. In: *Stress challenges and immunity in space: From Mechanisms to Monitoring and Preventive Strategies*. A.Chouker Verlag: Springer Berlin Heidelberg; pp 387-403, 2012 ISBN-10: 3642222714

Heer M, **Baecker N**, Zwart SR, Smith SM. Interactions among artificial gravity, the affected physiological systems, and nutrition. In: *Clement & Buckley, Artificial Gravity'*, Springer, New York, USA, 2007, pp 249-270

## **Ausgewählte Abstracts / Kongressbeiträge (ab 2003)**

**Baecker N**, Graf S, Heer M. Optimierung der Ernährung als seine Maßnahme gegen den immobilisationsbedingten Knochenabbau in Schwerelosigkeit und Bettruhe. Nationales Symposium: *Forschung unter Weltraumbedingungen*, Oktober 28.-30. 2015, Bonn

**Baecker N** (2014) Space Nutrition. Annual Meeting of the British Society of Gastroenterology, June 16.-20. 2014, Manchester, United Kingdom, invited presentation

Graf S, **Baecker N**, Buehlmeier J, Fischer A, Smith SM, Heer M. Effects of resistive vibration exercise combined with whey protein and  $\text{KHCO}_3$  on bone turnover markers in head-down tilt bed rest (MTBR-MNX Study). 35<sup>th</sup> Annual Meeting of the International Society of Gravitational Physiology, June 16. - 20. 2014, Waterloo, Canada

Beck L, Mulder E, Gauger P, Titze J, Rauh M, Rakova N, Juettner K, May F, Heer M, **Baecker N**, Chernogorov R, Vassilieva G, Morukov B, Rittweger J, and Gerzer R (2013) MARS520: Ambulatory Blood Pressure Monitoring during Long-Term Confinement; Humans in Space Symposiums, 07.-12. July 2013, Cologne, Germany

Heer M, Buehlmeier, J, Smith SM, **Baecker N**, Frings-Meuthen P (2013) Effects of  $\text{KHCO}_3$  on bone resorption during high protein in bed rest (MEP Study) Humans in Space Symposium, 7.-12. July, 2013, Cologne, Germany

**Baecker N**, Buehlmeier J, Frings-Meuthen P, Beck L, Vassilieva G, Morukov, B und Heer, M. (2013) Bone turnover in long-term space flight simulation (MARS500) Gravitational Effects from Micro to Macro Biology, 23. – 28. June 2013, Toyohashi City, Aichi, Japan

Heer M, Buehlmeier J, Smith SM, **Baecker N**, Frings-Meuthen P. (2013)  $\text{KHCO}_3$  prevents increase in bone resorption with high protein in bed rest (MEP Study). Experimental Biology, 20.-24. April 2013, Boston, USA.

Heer M, Smith SM, Frings-Meuthen P, Zwart SR, Baecker N and Biolo G. (2011) High protein intake improves insulin sensitivity but exacerbates bone resorption in immobility, Meeting of the Diabetes and Nutrition Study Group(DNSG) 30.06.-02.07.2011, Rome, Italy

Buehlmeier, J., Frings-Meuthen, P., Remer, T., **Baecker, N.**, Biolo, G., Heer, M. (2010) Potassium bicarbonate lowers salt-induced protein wasting. Life in Space for Life on Earth, 13 - 18 June 2010, Trieste, Italy

Frings-Meuthen P., Buehlmeier J., **Baecker, N.**, Heer M. (2009). The role of salt intake during immobilisation. 31<sup>st</sup> ESPEN congress 2009, August 29-01, Vienna, Austria

Buehlmeier J., Frings-Meuthen P., **Baecker N.**, Stehle P., Heer M. (2009). High salt intake as an additional risk factor for protein losses in head down tilt bed rest. 17th IAA Humans in Space Symposium, June 06-11, Moscow, Russia

**Baecker N**, Frings-Meuthen P, May F, Felsenberg D and Belavy D H (2009). Effects of resistive exercise and resistive exercise in combination with vibration training on markers of bone turnover. 30th Annual International Gravitational Physiology Meeting 24-29 May, 2009, Fourth Military Medical University, Xi'an, China

Buehlmeier J, Frings-Meuthen P, **Baecker N**, Stehle P, Heer M (2009). High sodium chloride intake might contribute to muscle wasting via low-grade metabolic acidosis  
7th International Symposium on Nutritional aspects of Osteoporosis May 7-9, Lausanne, Switzerland

Heer M, Frings-Meuthen P, Buehlmeier J, **Baecker N** (2008). Interactions between high salt intake and the musculoskeletal system. COSPAR, 13. – 20. July 2008, Montreal, Canada

Buehlmeier J, Frings-Meuthen P, **Baecker N**, Stehle P, Heer M (2008). High dietary sodium chloride causes protein loss during head-down tilt bed rest (HDBR). COSPAR, 13. – 20. July, Montreal, Canada

Buehlmeier J, Frings-Meuthen P, **Baecker N**, Stehle P, Heer M. (2008) Effect of high salt intake on acid base and nitrogen balance during 14 days of head-down-tilt bed rest, ISGP Meeting and 10th ESA Life Science Symposium, 22.-27-06.2008, Angers, France.

Frings-Meuthen P, Buehlmeier J, **Baecker N**, Heer M. (2008) Potassium bicarbonate (KHCO<sub>3</sub>) as a countermeasure for salt-induced bone loss in space? ISGP Meeting and 10th ESA Life Science Symposium, 22.-27-06.2008, Angers, France.

Frings P, **Baecker N**, Heer M (2007). High sodium chloride intake exacerbates immobilisation induced bone loss. Experimental Biology, 28. April – 02. May 2007, Washington DC, USA

Frings P, **Baecker N**, Heer M. (2007) Exacerbated bone resorption during 14 days of bed rest due to high sodium chloride intake. Medizin und Mobilität, 8 th Annual Meeting, Cologne, Germany

Heer M, Frings P, Mersch S, **Baecker N**, Beck L. (2007) Contrary to ambulatory conditions, high NaCl-intake during head-down bed rest leads to negative potassium balances. Experimental Biology 2007, 28. April – 02. May 2007, Washington DC, USA

Frings P, **Baecker N**, Heer M (2006): Bone loss because of high sodium intake: Is there a connection to the acid-base balance? In: Acid-Base Symposium, Abstracts, 2nd International Acid-Base Symposium, September 08-09, Munich, Germany.

Liphardt AM, Mündermann A, Koo S, **Baecker N**, Andriacchi T, Zange J, Mester J, Heer M (2006): Changes in Cartilage Morphology of the Knee after 14-days of Bed Rest. 36th COSPAR Scientific Assembly, Beijing, China.

Heer M, Frings P, **Baecker N**. High sodium chloride intake causes mild metabolic acidosis. Is this the cause for bone resorption? 6th International Symposium on Nutritional Aspects of Osteoporosis, Lausanne, 04.-06.05. 2006, Switzerland

Liphardt AM, Mündermann A, **Baecker N**, Zange J, Mester J, Heer M (2006): Serum COMP concentration is sensitive to a 14.day bed rest intervention. 52nd Annual Meeting of the Orthopaedic Research Society, Chicago, Illinois, USA.

**Baecker N**, Liphardt A, Frings P, Boese A, Heer M. (2005) Effects of Mechanical Stimuli via Vibration Training on Bone Metabolism in Immobilized Healthy Subjects. 56th International Astronautical Congress 14.10. – 21.10., Fukuoka, Japan

**Baecker N**, Boese A, Smith S, Heer M. (2005) Knochenabbau in Immobilisation: Erhöhte Calciumgabe als sinnvolle Gegenmaßnahme? Deutsche Gesellschaft für Ernährung. Proc Germ Nutr Soc, 7: 70-71

Frings P, **Baecker N**, Boese A, Heer M. Hohe Kochsalzzufuhr bewirkt eine milde metabolische Azidose: Ist dies die Ursache für erhöhten Knochenabbau? (2005) 7. Kongress Medizin & Mobilität, June/July 29. – 02., Cologne, Germany

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Heer M, Frings P, **Baecker N**. Bone loss following high sodium intake is mediated by low-grade metabolic acidosis (2005). Humans in Space-Congress, 22.-27. May, Graz, Austria

Frings P, **Baecker N**, Boese A, Heer M. (2005) High sodium chloride intake causes mild metabolic acidosis: Is this the reason for increased bone resorption? FASEB Journal, Vol 19 (5): A1345

**Baecker N**, Boese A, Smith S.M, Heer M. (2004) High dietary calcium intake does not counteract disuse-induced bone loss. 35th COSPAR-Meeting, 18.-25. July 2004, Paris, France

**Baecker N**, Boese A, Smith SM, Heer M. (2004) High calcium intake does not counteract disuse induced bone resorption 35th COSPAR Scientific Assembly 2004, 18.-25.7., Paris, France

**Baecker N**, Gerzer, R, Schoenau, E, Heer M. (2003) Effects of long-term supplementation with L-Arginine, the natural precursor of Nitric Oxide, on bone metabolism 5th International Symposium on Nutritional Aspects of Osteoporosis, 14.-17.5., Lausanne, Switzerland