

Prof. Dr. M. Bader

Forschungsstelle des Max-Delbrück-Center, Berlin, an der
Universität zu Lübeck

Kontakt:

Max-Delbrück-Centrum
für Molekulare Medizin
Berlin-Buch
Robert-Rössle-Str. 10
13092 Berlin

Phone: +49 (0)30 9406 0

Fax: +49 (0)30 949 4161

Universität zu Lübeck
Institut für Biologie
Ratzeburger Allee 160
23562 Lübeck

Phone: +49 (0) 451 500-4101 (Fr. Schweitzer)

Fax: +49 (0) 451 500-4815

Forschung:

Analysis of the specific functions of alpha-Importins

Importins are essential components of the machinery that transports proteins into the nucleus of eukaryotic cells. In the MDC-laboratory at the University of Lübeck we collaborate with other groups at the Institute for Biology to clarify the physiological functions of α importins. For this purpose, we have generated knockout mice for five paralogs of this protein family. The most obvious phenotype was discovered in mice lacking importin $\alpha 7$: Both sexes of these animals are infertile. The female infertility is based on an essential function of importin $\alpha 7$ during zygotic genome activation of developing embryos. The reason for the male infertility is still under investigation. Besides its function in fertility, importin $\alpha 7$ is pivotal for influenza virus infection of cells. In addition, we could show that the absence of importin $\alpha 5$ during mouse development does not significantly interfere with neuronal differentiation and proper brain development, in contrast to the prediction based on a study in cell culture. Furthermore, the fertility and cardiovascular phenotypes of importin $\alpha 1$, $\alpha 3$, and $\alpha 4$ deficient mice are analyzed.

In the frame of the German Centre for Cardiovascular Research we collaborate with other groups at the University of Lübeck (Institutes for Pharmacology and for Integrative and Experimental Genomics) on the functional characterization of proteins involved in cardiovascular and metabolic regulation using transgenic and knockout rodent models.

Publikationen:

Ben-Yaakov K, Dagan SY, Segal-Ruder Y, Shalem O, Vuppalanchi D, Willis DE, Yudin D, Rishal I, Rother F, Bader M, Blesch A, Pilpel Y, Twiss JL, Fainzilber M. Axonal transcription factors signal retrogradely in lesioned peripheral nerve. *EMBO J*. 2012 Jan 13; 31(6):1350-63.

Fielhaber JA, Tan J, Joung KB, Attias O, Hugel S, Bader M, Roux PP, Kristof AS. Regulation of Karyopherin-alpha1 and nuclear import by mTOR. *J Biol Chem*. 2012, 287:14325-14335

Rother F, Shmidt T, Popova E, Krivokharchenko A, Hugel S, Vilianovich L, Ridders M, Tenner K, Alenina N, Kohler M, Hartmann E, Bader M. Importin α 7 is essential for zygotic genome activation and early mouse development. *PLoS One*. 2011 Mar 29;6(3):e18310.

Gabriel G, Klingel K, Otte A, Thiele S, Hudjetz B, Arman-Kalcek G, Sauter M, Shmidt T, Rother F, Baumgarte S, Keiner B, Hartmann E, Bader M, Brownlee GG, Fodor E, Klenk HD. Differential use of importin- α isoforms governs cell tropism and host adaptation of influenza virus. *Nat Commun*. 2011 Jan 18;2:156.

Muller H, Kroger J, Joehren O, Szymczak S, Bader M, Dominiak P, Raasch W. Stress sensitivity is increased in transgenic rats with low brain angiotensinogen. *J Endocrinol*. 2010; 204: 85-92

Voigt JP, Raasch W, Hornagl H, Bader M, Fink H, Johren O. Changes in brain serotonin satiety system in transgenic rats lacking brain angiotensinogen. *J Neuroendocrinol*. 2008, 20: 182-187

Shmidt T, Hampich F, Ridders M, Schultrich S, Hans VH, Tenner K, Vilianovich L, Qadri F, Alenina N, Hartmann E, Kohler M, Bader M. Normal brain development in importin- α 5 deficient-mice. *Nat Cell Biol*. 2007 Dec; 9(12):1337-8.