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Heme release due to tissue injury triggers inflammation and is strictly controlled by heme oxygenase-1 (HO-1), an inducible enzyme that degrades heme to carbon monoxide, biliverdin and Fe(II). HO-1 induction is repressed by the transcription factor (TF) Bach1 through binding to stress responsive promoter elements in complex with small Maf proteins, thus inhibiting Nrf2 TF binding and HO-1 transcription. Bach1 knockout mice were reported to be protected in a number of in vivo tissue injury models, e.g., colitis, hepatic injury, and atherosclerosis. While Bach1 seems to be ubiquitously expressed, the second Bach TF, Bach2, is dominant in immune cells. Bach2 drives B and T cell subtype identity, controlling access of TFs to enhancer regions. In this role Bach2 interacts with other TFs such as BATF, AP-1, and CEBP. While no variants of Bach1 are known, human Bach2 polymorphisms have been described to be associated with numerous autoimmune and allergic diseases such as rheumatoid arthritis, Graves' disease, inflammatory bowel disease, coeliac disease, and asthma. It will be key to understand the factors of differential recruitment of Bach TFs to shared DNA binding sites, by using genetic and protein approaches to understand their involvement in human disease.

**Selected Publications**

[Fragments of HdhQ150 mutant huntingtin form a soluble oligomer pool that declines with aggregate deposition upon aging.](#)

Marcellin D, Abramowski D, Young D, Richter J, Weiss A, Marcel A, Maassen J, Kauffmann M, Bibel M, Shimshek DR, Faull RL, Bates GP, Kuhn RR, Van der Putten PH, Schmid P, Lotz GP.

*PLoS One. 2012;7(9):e44457.*

[Embryonic stem cell-derived neurons as a cellular system to study gene function: lack of amyloid precursor proteins APP and APLP2 leads to defective synaptic transmission.](#)

Schrenk-Siemens K, Perez-Alcala S, Richter J, Lacroix E, Rahuel J, Korte M, Müller U, Barde YA, Bibel M.

*Stem Cells. 2008 Aug;26(8):2153-63.*

[Differentiation of mouse embryonic stem cells into a defined neuronal lineage.](#)

Bibel M, Richter J, Schrenk K, Tucker KL, Staiger V, Korte M, Goetz M, Barde YA.

*Nat Neurosci. 2004 Sep;7(9):1003-9.*

[Click here](#) for additional publications.

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