Like mosttumors, meningiomas prefer anaerobic glycolysis for energy production (Warburg effect). This leads to an increased synthesis of the metabolite methylglyoxal (MGO). This metabolite is known to react with amino groups of proteins. This reaction is called glycation, thereby building advanced glycation endproducts (AGEs). In a study, Selke et al investigated the influence of glycation on two meningioma cell lines, representing the WHO grade I (BEN-MEN-1) and the WHO grade III (IOMM-Lee). Increasing MGO concentrations led to the formation of AGEs and decreased growth in both cell lines. When analyzing the influence of glycation on adhesion, chemotaxis and invasion, we could show that the glycation of meningioma cells resulted in increased invasive potential of the benign meningioma cell line, whereas the invasive potential of the malignant cell line was reduced. In addition, glycation increased the E-cadherin- and decreased the N-cadherin-expression in BEN-MEN-1 cells, but did not affect the cadherin-expression in IOMM-Lee cells [1)].

1)
Selke P, Rosenstock P, Bork K, Strauss C, Horstkorte R, Scheer M. Glycation of benign meningioma cells leads to increased invasion. Biol Chem. 2021 Mar 17. doi: 10.1515/hsz-2020-0376. Epub ahead of print. PMID: 33725749.