MBD Talk 1 Writeup

Andrew Rosen

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This talk was about Glioma-initiating cells (GIC). Glioblastoma, or GBM, is the most prevalent form of brain tumors and, unfortunately, also the most lethal. Researchers have been interested in GIC's, which have some characteristics extremely similar to stem-cells [3], but also because they are responsible for resistance to chemotherapy [1].

Wang et al. [3] found that miR-33a promotes GIC growth and renewal. In 107 examined patient with GBM, patients with low levels of miR-33a had a longer survival. This is in comparison to the patient population with high levels of miR-33a, which had a very sharp drop-off in survival. Inhibiting miR-33a in rats slowed the self-renewal process and the tumor progression stage of GIC's The mechanisms behind this are two targets of miR-33a: PDE8A and UVRAG, which had a reverse correlation with miR-33a level. Introducing a compound to inhibit the production of miR-33a look to be a promising treatment, but the blood-brain barrier would have to somehow be overcome for delivery.

Hu et al. [2] noted previous research that indicate that glioblastoma stem cells (GSC) thrived under hypoxic mircoenviroments. They found that miR-215 played a significant role in mediating GSC growth under hypoxic conditions.

References

[1] Shideng Bao, Qiulian Wu, Roger E McLendon, Yueling Hao, Qing Shi, Anita B Hjelmeland, Mark W Dewhirst, Darell D Bigner, and Jeremy N Rich. Glioma stem cells promote radioresistance by preferential activation of the dna damage response. *Nature*, 444(7120):756–760, 2006.

[2] Jing Hu, Tao Sun, Hui Wang, Pingping Wang, Xiang-Dong Fu, Qi-Jing Li, and Xiao-Fan Wang. Roles of mir-215 and regulatory mechanisms for its biogenesis in response to hypoxia in glioblastoma stem cells. *Cancer Research*, 74(19 Supplement):3536–3536, 2014.

[3] Hui Wang, Tao Sun, Jing Hu, Rui Zhang, Yanhua Rao, Shuai Wang, Rui Chen, Roger E McLendon, Allan H Friedman, Stephen T Keir, et al. mir-33a promotes glioma-initiating cell self-renewal via pka and notch pathways. *The Journal of clinical investigation*, 124(10):4489, 2014.