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Annotated Bibliography

Blaney, C. E., Gunn, R. K., Stover, K. R., & Brown, R. E. (2013). Maternal genotype influences behavioral development of 3×Tg-AD mouse pups. *Behavioural Brain Research, 252*, 40.

In this paper it was found that postnatal maternal effects of rearing resulted in changed phenotypes of the 3xTg-AD mice. The pups that were reared by wild-type mothers at the end of the testing period, weighed more and had more horizontal activity than those reared by transgenic mothers. This project was one of the main inspirations for my project because it looked at post-natal care in of 3×Tg-AD mouse pups which made me question whether *in utero* maternal genotype could alter the 3×Tg-AD mouse pups phenotype as well.

Bryan, K., Lee, H., Perry, G., *et al.* (2009). Transgenic Mouse Models of Alzheimer's Disease: Behavioral Testing and Considerations. In: Buccafusco JJ, editor. Methods of Behavioral Analysis in Neuroscience. 2nd Edition. Boca Raton (FL): CRC Press/Taylor & Francis.

This resource lays out various testing experiments for specifically transgenic mouse models of Alzheimer's Disease as well as outlining some of the characteristics of specific transgenic mouse models. This was a helpful resource when considering the type of experiment, I would like to undertake for my project. With little background knowledge on the topic, though I did not end up taking any of these sample experiments, I was able to gain an appreciation for the type of set ups that could be achieved. Though I did not directly use this paper in my project, it was an essential stepping stone for understanding what type of experiments are useful in studying disease model mice.

Careau, V., Bininda-Emonds, O. R. P., Ordonez, G., & Garland Jr, T. (2012). Are voluntary wheel running and open-field behavior correlated in mice? different answers from comparative and artificial selection approaches. *Behavior Genetics, 42*(5), 830-844. doi:10.1007/s10519-012-9543-0

This paper compares volunteer wheel running and open-field behavior as ways of studying to locomotion activity of laboratory rodents. In their comparison they are looking to see if wheel running and open-field behavior are correlated or if one is more useful than the other. They conclude that the relation depends primarily on the type of wheel and the home cage, specifying that it is essential that clear distinction be made among different measures of movement behavior as well as if the test was done in a familiar or new environment. This paper comparison was useful for my project as it allowed me to see the benefits and essential components of different types of locomotion testing experiments with mice.

Cho, A., Haruyama, N., & Kulkarni, A. B. (2009). Generation of transgenic mice. *Current Protocols in Cell Biology / Editorial Board, Juan S. Bonifacino .. [Et Al.], Chapter 19*, Unit 19.11.

This is a guide on how to create transgenic mice. For my project I did not generate a novel transgenic mouse as I used as established model for Alzheimer's Disease, the 3xTg-AD mouse, but this was a good starting point resource. Taking on a project using transgenic mice without ever having dealt with this topic is daunting so extensive background information was required. Though this resource did not make it to my final project, the background information it supplied on the sort of "history of transgenic mice" was helpful to bring me into the sphere of transgenic mice models.

Dunnett, S. B., & Brooks, S. P. (2009). Tests to assess motor phenotype in mice: A user's guide. *Nature Reviews Neuroscience, 10*(7), 519-529. doi:10.1038/nrn2652

This is an overview of the various tests available to researchers when looking at motor activity and relating it a specific transgenic phenotype in mouse models. In specific the section on locomotor activity tests was the basis of my experimental design on how to test activity level. This was a helpful resource for a beginner who does not have any experience working with transgenic mice models as general procedures were outlined.

Heijtz, R. D., Wang, S., Anuar, F., Qian, Y., Björkholm, B., Samuelsson, A.. . Zychlinsky, A. (2011). Normal gut microbiota modulates brain development and behavior.*Proceedings of the National Academy of Sciences of the United States of America, 108*(7), 3047-3052. doi:10.1073/pnas.1010529108

This paper is looking at germ-free mice that are exposed to gut microbiota early in their lives and as such show similar traits to specific pathogen free mice such as anxiety behaviour. The results showed that microbial colonization processes starts a signaling mechanism that will affect neuronal circuits involved with motor and anxiety behaviour. This paper is not used in my final project but coming across it in my research was very helpful. This was the first I had heard of using motor activity to link to anxiety-like behaviour in mice. I used this as inspiration to look into further research if other neurological behaviours could be measured with motor activity. As this was a key step in my project and part of my ultimate experimental design, I chose to include it in my annotated bibliography.

National Institutes of Health(NIH). (2015). *Frontotemporal Neurocognitive Disorder* (4th ed.) Oxford University Press.

This resource gave a general overview of frontotemporal disorders, including Alzheimer's Disease in humans. Information that was helpful included basic overviews, causes, diagnosis and treatment in humans. This allowed for the choice of a phenotype that was both seen in humans and the 3×Tg-AD mouse model – sleep-wake pattern disruption. Though my project deals with a mouse model for Alzheimer's Disease, having a general understanding of the disease in humans is helpful for seeing the implications that my project could have in the healthcare field.

Salam, J. N., Fox, J. H., DeTroy, E. M., Guignon, M. H., Wohl, D. F., & Falls, W. A. (2009). Voluntary exercise in C57 mice is anxiolytic across several measures of anxiety. *Behavioural Brain Research, 197*(1), 31-40. doi:10.1016/j.bbr.2008.07.036

This article looks at the affect of voluntary wheel running exercise in C57 mice. Specifically they are looking at the anxiolytic effect of this voluntary wheel running with several correlated factors such as body temperature. This was a paper that did not become essential to the final project but useful in the exploration of if my project would be ethical. Wheel running locomotive tests are done frequently but having much knowledge into this type of experiment, I found this article useful as it outlines how this type of wheel running exercise is reducing of anxiety as compared to other types of experiments I came across that were noted as possibly increasing anxiety.

Sterniczuk, R., Dyck, R. H., LaFerla, F. M., & Antle, M. C. (2010). Characterization of the 3xTg-AD mouse model of alzheimer's disease: Part 1. circadian changes. *Brain Research, 1348*, 139-148. doi:10.1016/j.brainres.2010.05.013

This study looked at the Circadian disturbances in the 3×Tg-AD mouse model through activity levels during normal sleep-wake cycles. Through studying the sleep-wake patterns of the 3×Tg-AD mice based on the circadian mammal cycle, they demonstrated that abnormalities in the circadian pattern actually proceed Alzheimer's Disease pathology in mice just as is seen in humans. By adding to the ways that the 3×Tg-AD mouse model can be used to study Alzheimer's Disease, this was the precedent for my project. This paper's conclusions led me to question that if this phenotype is seen in the 3×Tg-AD mice, than is it subject to maternal genotype influence as is with other phenotypes of the 3×Tg-AD mice (such as general fitness).

Wu, Y., & Swaab, D. F. (2007). Disturbance and strategies for reactivation of the circadian rhythm system in aging and Alzheimer's Disease. *Sleep Medicine, 8*(6), 623.

This paper outlines how circadian rhythm disturbances are seen in aging and even pronounced Alzheimer's disease cases in humans specifically looking at how this disturbance could be altered back to undisturbed state (how the disease phenotype could be treated). Though this paper was not directly related to my project, it assisted in understanding how Alzheimer's disease in mammals can be linked to disturbances in the circadian sleep-wake pattern by outlining the role of the suprachiasmatic nucleus. This paper became key in the development of my project as it allowed for the connection of a human-mouse model phenotype that connected to Alzheimer's disease pathology.