**Annotated Bibliography: Viral Infection Strategies
Lily Barrett**

Bennett, A., Patel, S., Mietzsch, M., Jose, A., Lins-Austin, B., Yu, J. C., Bothner, B., McKenna, R.,

& Agbandje-McKenna, M. (2017). Thermal Stability as a Determinant of AAV Serotype Identity. Molecular therapy. Methods & clinical development, 6, 171–182. <https://doi.org/10.1016/j.omtm.2017.07.003>

* This paper demonstrates how to identify AAV serotype by temperature. Using differential scanning fluorimetry, only a small amount of sample is needed to identify the melting point, allowing for a reliable and relatively cheap method to identify serotype.

Botterill, J. J., Khlaifia, A., Walters, B. J., Brimble, M. A., Scharfman, H. E., & Arruda-Carvalho, M.

(2021). Off-Target Expression of Cre-Dependent Adeno-Associated Viruses in Wild-Type C57BL/6J Mice. eNeuro, ENEURO.0363-21.2021. Advance online publication. <https://doi.org/10.1523/ENEURO.0363-21.2021>

* This paper shows that cre dependent viruses produce low level expression in non-cre cells. However, there is a clear visual difference between the cre dependent expression and the off-target expression. However, amplification of the fluorescent signals with immunohistochemistry can reduce the ability to visually discriminate between the two expressions. DREADD experiments showed no behavioral changes due to off target expression.

Sun, L., Tang, Y., Yan, K., Yu, J., Zou, Y., Xu, W., Xiao, K., Zhang, Z., Li, W., Wu, B., Hu, Z., Chen, K.,

Fu, Z. F., Dai, J., & Cao, G. (2019). Differences in neurotropism and neurotoxicity among retrograde viral tracers. Molecular neurodegeneration, 14(1), 8. <https://doi.org/10.1186/s13024-019-0308-6>

* This paper looks at transsynaptic retrograde tracing using rabies and pseudorabies viruses. Here they compared type of neurons with expression and the neurotoxicity of different retrograde tracers. This paper also uses several retrograde tracers in conjunction to map more synapses.

Su, W., Kang, J., Sopher, B., Gillespie, J., Aloi, M. S., Odom, G. L., Hopkins, S., Case, A., Wang, D.

B., Chamberlain, J. S., & Garden, G. A. (2016). Recombinant adeno-associated viral (rAAV) vectors mediate efficient gene transduction in cultured neonatal and adult microglia. Journal of neurochemistry, 136 Suppl 1(0 1), 49–62. <https://doi.org/10.1111/jnc.13081>

* This paper looks at AAVs targeting either cultured neonatal or adult glial cells. The authors compare neurotoxicity and inflammation to lentivirus glial infection and found AAV had the least toxic or inflammatory effects. They also look at gene delivery and glial behavior post infection. While they primarily use AAV2, they also compare other AAVs at glial infection.

Zingg, B., Chou, X. L., Zhang, Z. G., Mesik, L., Liang, F., Tao, H. W., & Zhang, L. I. (2017). AAV

Mediated Anterograde Transsynaptic Tagging: Mapping Corticocollicular Input-Defined Neural Pathways for Defense Behaviors. Neuron, 93(1), 33–47. <https://doi.org/10.1016/j.neuron.2016.11.045>

* This paper functionally uses AAVs to trace anterograde projections from the visual cortex. The authors compare fluorescent expression from AAVs acting as an anterograde transsynaptic tracer, primarily AAV 1 and 9. From there, they chose to use AAV1 primarily. Next, they looked at injection site spread, fluorescent expression in downstream neurons, as well as, titer and expression time to develop their protocol to best suit their tracing needs. This lab also looks at cell type specific AAV1 anterograde expression, as well as the cellular mechanism of AAV tracing, in their paper titled “Synaptic Specificity and Application of Anterograde Transsynaptic AAV for Probing Neural Circuitry”.

<https://datahub.addgene.org/aav/?gclid=Cj0KCQiAkNiMBhCxARIsAIDDKNXl9j7OEPEsPcYjpe4cp7MsITg7jIRHDuH5EA9ORQAvmTntx7E9zIkaAopwEALw_wcB>

* This website is a reputable source for purchasing AAVs for viral infection. They also have several guides out to understand the science of AAVs, which work best in what tissue, and how the gene delivery works, especially when utilizing the cre/lox system. This website provides a database for AAV use in real, published experiments.

<https://www.vectorbiolabs.com/intro-to-aav/>

* This website provides a thorough background on all aspects of AAV development, production, and use. At the bottom of this page you can find information on customizing your own viral vector as well as FAQ links.

<https://www.bioinformatics.org/sms2/orf_find.html>

* This website contains a database of sequences, allowing for quick searching for open reading frames for your gene of interest. However, this website is very large and has many useful features for in-depth genomics and bio informatics. This is useful when developing a custom AAV.

<https://spirit.cladiac.com/aav.html>

* This website recommends AAV serotype when you input host, tissue, and cell-type you are interested in. This is a convenient way to discern which AAV to buy to test your specific hypothesis.

<http://ml-neuronbrowser.janelia.org/>

* This is an ongoing project to condense traced pathways in the CNS and allows for the quick search of brain areas, cell types, and their projections. You start by searching by brain region and a 3D model of the area will appear with colored lines representing labelled neuron types. Currently, not all neuron types are known and not all neurons/ areas are well represented as this is a relatively new project.