Elongated Capsid Generation in the Browser

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[Introduction]

Previous work implemented the Caspar-Klug capsid model in the browser. This work adds functionality based on the Moody construction and results from Luque and Reguera (2010) to accommodate additional viral phenotypes. The result is a parameterized application built on paper.js that generates elongated capsid nets as high-quality SVG images. Next steps include the generation of three-dimensional models with alternate tiling models.

- **Repository:** https://github.com/dnanto/capsid
- **Prototype:** https://dnanto.github.io/capsid/net.html

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Dissertation committee:

- Dr. Donald Seto (chair)
- Dr. Patrick Gillevet
- Dr. Sterling Thomas

[References]

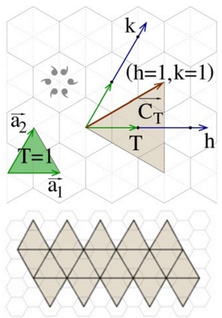
- Caspar, D. L., & Klug, A. (1962). Physical principles in the construction of regular viruses. *Cold Spring Harbor Symposia on Quantitative Biology*, *27*, 1–24. https://doi.org/10.1101/sqb.1962.027.001.005
- Moody, M. F. (1965). The shape of the T-even bacteriophage head. *Virology*, *26*(4), 567–576. https://doi.org/10.1016/0042-6822(65)90319-3
- Luque, A., & Reguera, D. (2010). The Structure of Elongated Viral Capsids. *Biophysical Journal*, *98*(12), 2993–3003. https://doi.org/10.1016/j.bpj.2010.02.051
- Lehni, J., & Puckey, J. (2020). *Paperjs/paper.js* [JavaScript]. Paper.js. https://github.com/paperjs/paper.js (Original work published 2011)

[Methods]

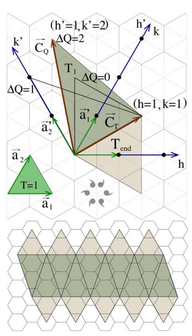
Reference

(Luque & Reguera, 2010)

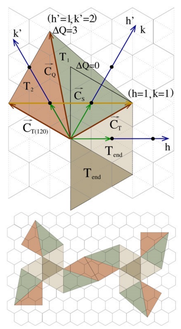
Caspar-Klug



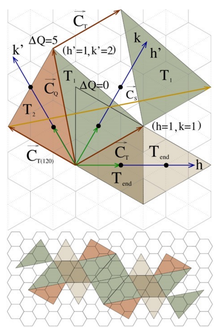
Fivefold Symmetry



Threefold Symmetry



Twofold Symmetry



[Results]

Application Screenshot