Purpose:
Bridge the gap in science education between viewing receptor binding as a “lock-and-key” to more biologically accurate mechanism of dopamine receptors.

Background:
- D1-like receptors (D1 & D5) are GPCRs
- They are 80% homologous in transmembrane domains but differ slightly in residues in the third cytoplasmic loop & C terminus 1,2
- Binding pockets are identical except for additional residue, Ile169, on D5 3

Methods:
- Conducted research on current models of D1 and D5 receptors
- Created initial prototypes using MakerSpace design kits (fig. 1)
- Completed 3D printing training
- Drew sketches of receptors (fig. 2)
- Designed 3D model using TinkerCAD and SWISS software4
- Printed 3D model at BeAM Makerspace using alternaker with CPE filament assembled using deryun magnets and rubber bands

Design Process:
We planned to create 3D printed models of D1&D5 (fig. 1), but after difficulty replicating that degree of detail, we decided to focus on a general binding mechanism of dopamine GPCRs for our 3D printed model. We also changed the original design from a sphere to a cylinder to better reflect the structure of the receptor (fig. 3).

Discussion and Implications:
Our model demonstrated the complexity of dopamine receptor binding. Dopamine “binds” above the shaft pushing on a spring which exposes a magnet that the G-protein binds to. As a result, the G-protein will dissociate into its signaling subunits. (fig 3)

Contribution:
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