(please answer in complete sentences - do not answer with a simple yes or no)

**Use case 1: Explosion of Molecular Structures:**what does the three dimensional structure of the virus and its inner compartments actually look like and how do they relate to each other hierarchically?  
<https://www.youtube.com/watch?v=FRyS-tffwNY>

1) do you feel, the presented transition could answer the posed questions adequately? if not, how could it be improved?

If you are asking about the high-level structure, then I think this animated transition using a layer-pealing exploded view approach does a good job to answer the posed question

1b) what do you like/dislike about the transition? I like the clamshell explosion technique- it does a nice job of revealing the spatial relationships without distorting or deleting any information. I think better lighting, e.g. global illumination/ambient occlusion, could show the dents left when large items are removed, for example the inverse hemisphere left in the blood plasma when the HIV is removed.

2) what kind of additional information could you infer from the transition that you were not able to infer from the target representation (final image) alone? I could infer where each piece had come from. As mentioned above, if the lighting had effects like ambient occlusion or global illumination, we would be able to infer where towards the left each piece had come from.

3) what do you like/dislike about the final representation? I like how the matryoshka doll approach (clamshell exploded view), reveals the hierarchical “nesting” of the various compartments of HIV and its environment. When thinking about publication standards, one problem with the final image is that the space may not be used efficiently since things get smaller and smaller in height towards the right.

4) can you estimate how long it would take you to manually create such a rep/trans with the tools that you commonly use? After loading the representation into C4D using cellPACK, it would take me about 30 minutes to setup the clamshell opening sequences and another 30 minutes to an hour to keyframe, rig, or script the more detailed pieces that travel with the extracted components as they are pulled from the models towards the right. A model this size might take an additional 30-90 minutes to render.

**Use case 2: Schematization of Molecular Structures:**what types of molecules are contained in which compartment of virus, what do they look like, and in which approximate quantity are they present?  
<https://www.youtube.com/watch?v=vvCqX3nnyOk>

1) do you feel, the presented transition could answer the posed questions adequately? if not, how could it be improved?

Feel free to pull any of the more detailed notes I emailed last month about this one:

Yes, this transition does a great job of taking a densely packed model and simplifying it to reveal the composition of molecules that are isolated to each compartment, while still retaining a simplified rendition of the compartment (organic wavy colored compartment shapes.)

1b) what do you like/dislike about the transition? Overall, I like the simplified representation and the brick of blue goo that still gives an impression of the shape and the relationship of the color scheme where molecular color schemes match the simpler fills that they become. This does a great job of still showing the compartmentalizations and comparment-to-compartment relationships.

A major thing missing- the matrix of the HIV Is packed with proteins (this is the main thing our published models show, but in this transition, the HIV matrix (space between the envelope and the capsid) is completely empty and the proteins are missing.

2) what kind of additional information could you infer from the transition that you were not able to infer from the target representation (final image) alone? In seeing the original model, I could truly appreciate how dense things were. In the cleaned up final image, that density is harder to appreciate.

3) what do you like/dislike about the final representation?

See above

4) can you estimate how long it would take you to manually create such a rep/trans with the tools that you commonly use?

This would likely take me between 4 and 6 hours to recreate with Cinema 4D.

**Use case 3: Representation of Quantitative Relations:**how large is the volume of each compartment and the molecules contained within in respect to each other?  
<https://www.youtube.com/watch?v=oo4n78bY8ZE>

1) do you feel, the presented transition could answer the posed questions adequately? if not, how could it be improved?  
I don’t thinks this current implementation gives me an easy to understand or accurate depiction of the compartment volumes. If I wanted to compare the volumes of the compartment, I would prefer to have a bar in the graph for each compartment. In this version I have to mentally stack each molecular tower to sum them up to understand how tall the compartments are relative to each other. The lighting on the bars is hard to read, so the 3rd dimension in the bar graph could be interepreted as a taller bar instead of one that goes back into 3D space. The camera moves during the transition which makes it hard for me to understand how big the original sphere-shaped particle was before the layers got pealed away. Lastly, the bars are out of the safe area of the movie, at the border of the screen which makes them hard to read.

1b) what do you like/dislike about the transition?

See above for critiques. I do like the continuous connected flow from the 3D structure to the bar graphs to help maintain a visual connection. It is a fun piece to watch, but scientifically, I’m not sure how useful it can be until the issues described above are addressed.

2) what kind of additional information could you infer from the transition that you were not able to infer from the target representation (final image) alone?

Everything… simply because there is no before state in the final image, only a collection of lumpy 3D bar graphs with no labels, so it would be tough to understand where they came from or what they refer to. In that regard the animation is nice because it makes a connection from the complex structure to the volumetric analysis.

3) what do you like/dislike about the final representation?

See above… its out of context, needs labels or some relationship to the original , e.g. if the original came back up somehow at the end it would be a moore complete comparison.

4) can you estimate how long it would take you to manually create such a rep/trans with the tools that you commonly use?

This would take me between 6 and 12 hours to create with rigging and a bit of scripting in Cinema 4D