Dynamic Molecular Principles for Science Animators

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The “Principles”

Background & Objective

Through our research into how biology students learn from animation, it appears there is often a disconnect between molecular processes (e.g., a cell signal cascade) and behaviours. Visualizations may help bridge this gap. However, because of technical limitations, design constraints, or a lack of awareness of some fundamental concepts, 3D animations can show macromolecules with biophysically inaccurate properties.

Science animators must ask themselves, “How shall I depict molecular motion?” and “How will these molecules interact?” and “How shall I populate the environment?” We have identified twelve principles that serve as reminders of concepts and behaviours. We hope they will encourage designers to consider how to depict molecular phenomena accurately while conveying information clearly.

Visualization Design

Each principle is presented as a pair of short animations where Treatment A does not adhere to the principle and Treatment B does. For the sake of clarity, each pair depicts a simplified biological example and each principle is presented in isolation from other principles. The rendering style is clean and simple, yet uses plausible molecular representations.

The completed scenes are rendered with a few layers to allow for adjustments during compositing.

The animations are exported at full HD (1080p), suitable for publishing on the web and other platforms.

References & Funding


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