3DVC_Yellow3_PhysicalModels

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Yellow 3
Topic: Physical Models
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Publications are always missing the story of how the author got there. It gets edited out by others though.

Physical Models – Model systems that have enough simplicity that we can verify rapidly how they work. With just a few components you can get enough interesting behavior to demonstrate basic cell function. We should be able to make a computational model that simulates physical models. Simple subsets can give insight without complicated interactions for complex objects.

Some students don't get or appreciate physical models though. Different people need different types of stimulus for education. How do you reach out to students who need different educational modalities.

But physical models are important even graduate students who have taken biochemistry still get a lot out of physical models once they see them. It gives them a new approach to the material they've learned already. 'If you understand something only one way then you don't really understand it complete'. These are good thinking tools for discovering something on your own as opposed to rote learning and internal visualization.

These physical models are useful not just for education but also for discovery because they help you reconceive things you already know.

Augmented reality simulations may also help with a type of physical model you could manipulate with your hands.

Most molecules are bipolar so magnets inside of physical models could be helpful.

Is there a risk by being fooled from physical models? You just have to give the warning and keep in mind this isn't the real thing in every way.

It's important to keep in mind these models may not be complete.

Should we keep in mind protein overcrowding in protein models? It's definitely the goal it's still a complicated process under lots of research. Does overcrowding change rate constants, in what way and in what regimes of the occupied volume. There is different levels of range for random walks for different sized molecules.

Could kinetics not mean much for protein kinases? In some sense yes. But as data points at certain nature there is also many complicated processes occurring at the same time that could factor in.
What if the physical models were smart gadget with sensors that can detect their own positions and report to a computer that can send a command back to say: the resistance force has to be this strong at this distance. The computer could now give you a dynamic physical model that is closer to the real thing. You would need tiny electro magnets and wireless connections. Accelerometer and gyroscopic chips could help with determining position.