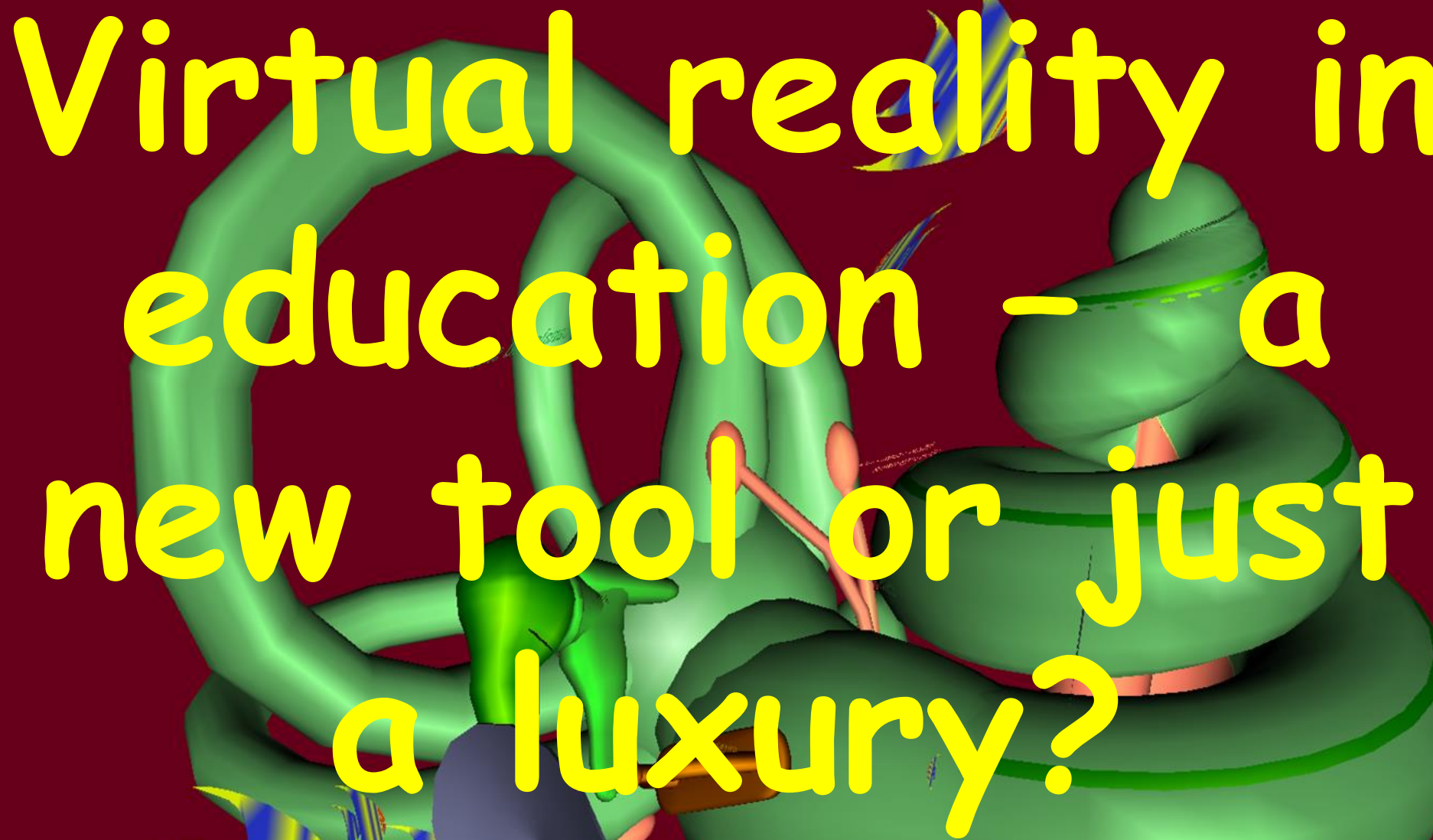


Virtual reality in
education – a
new tool or just
a luxury?

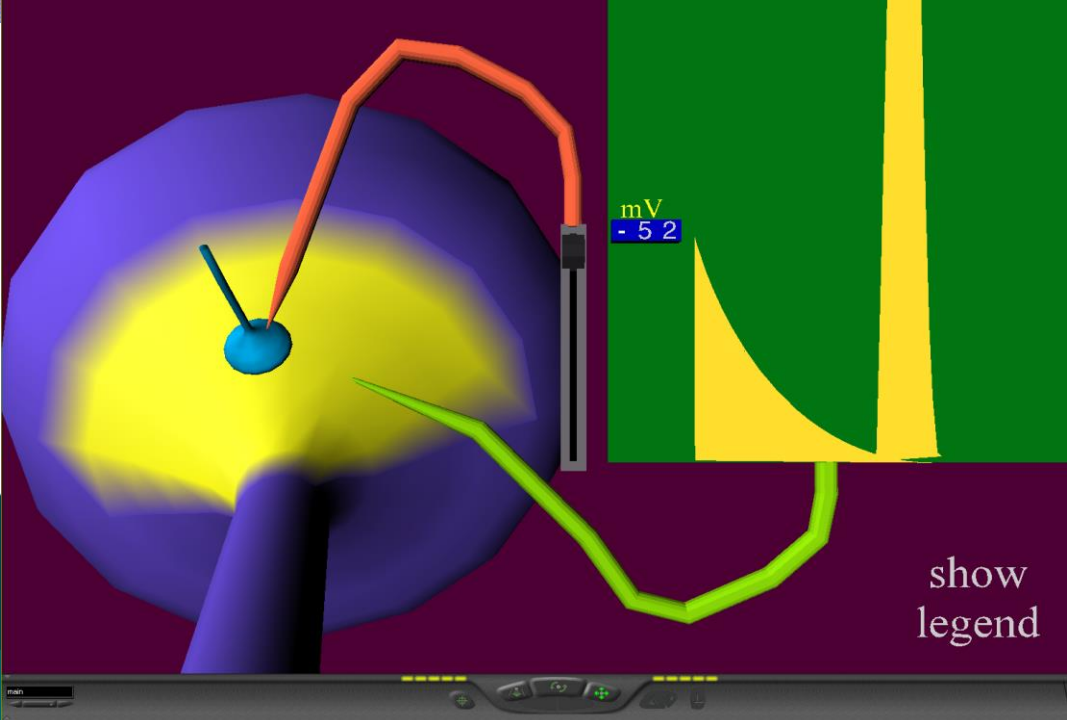
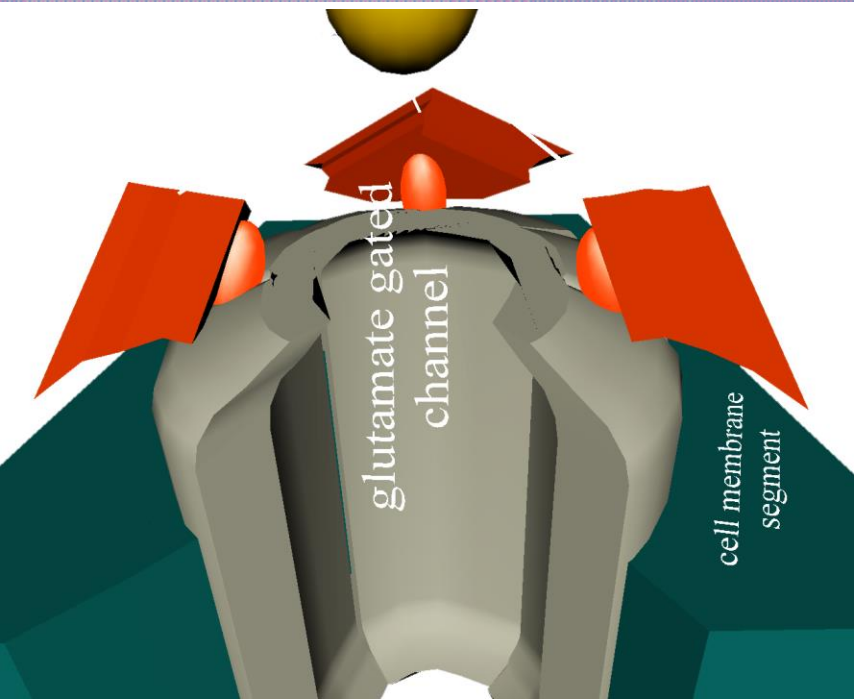
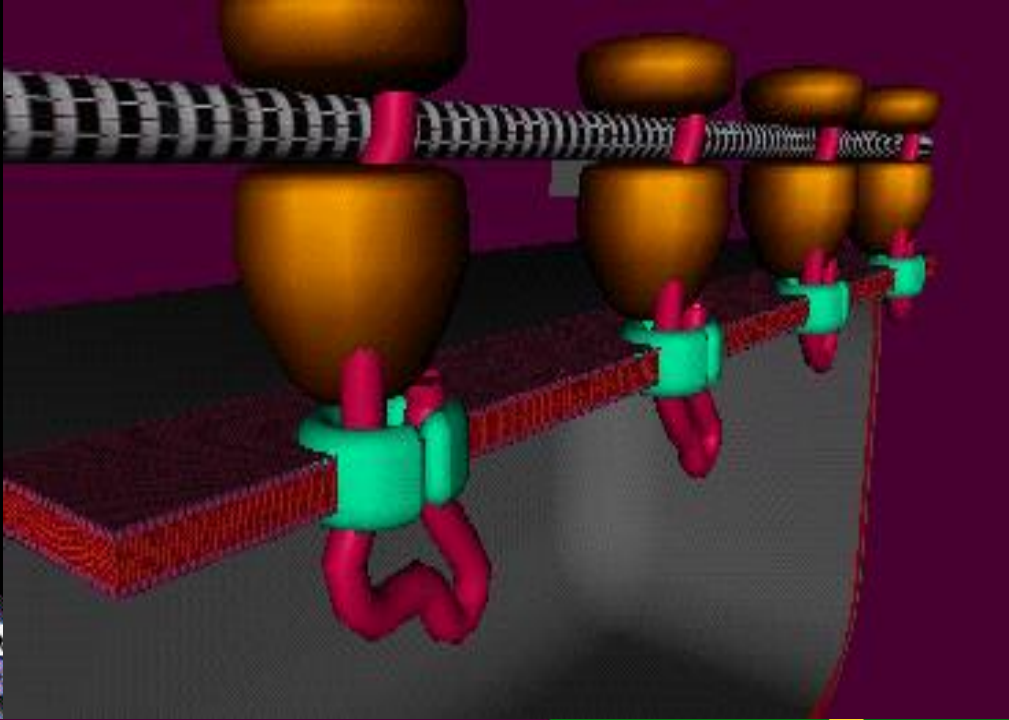
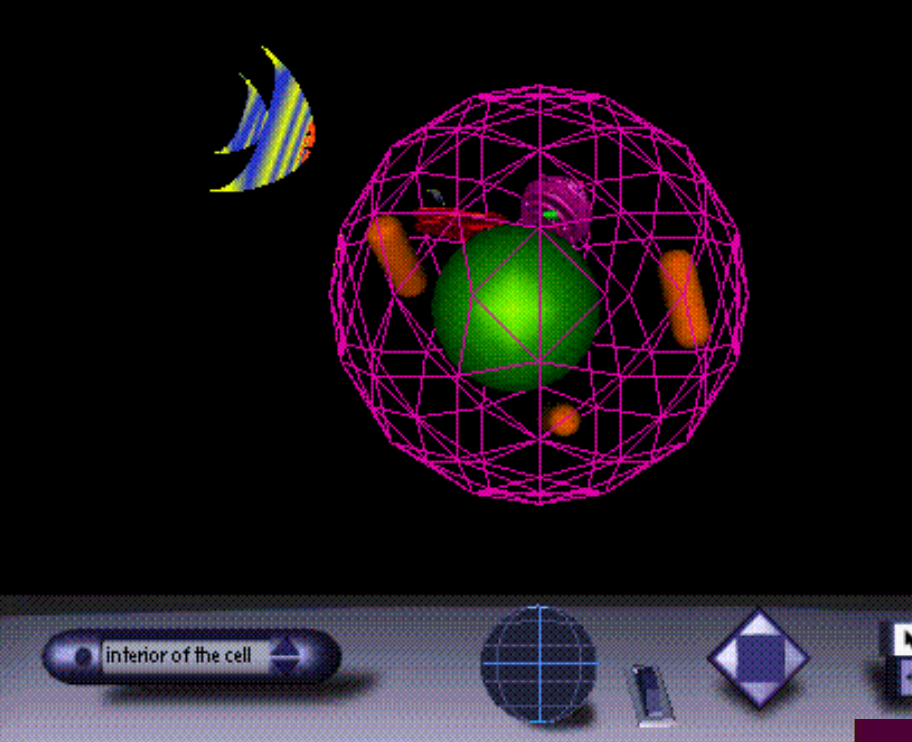


A bit of history

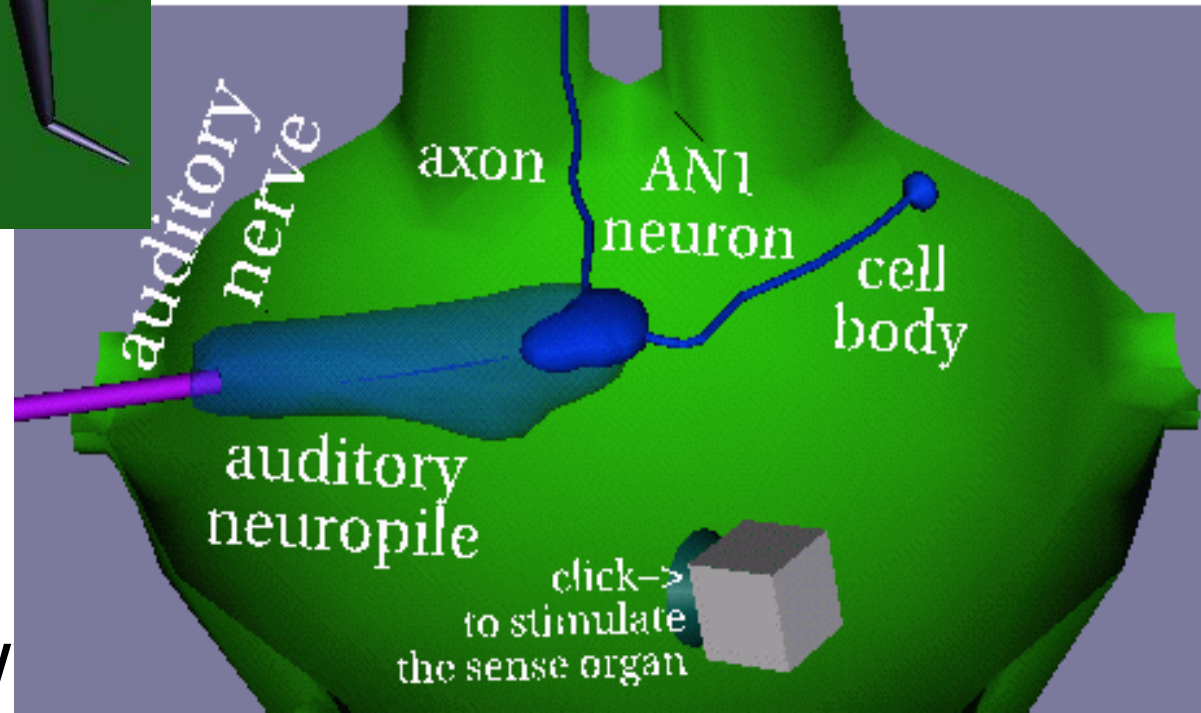
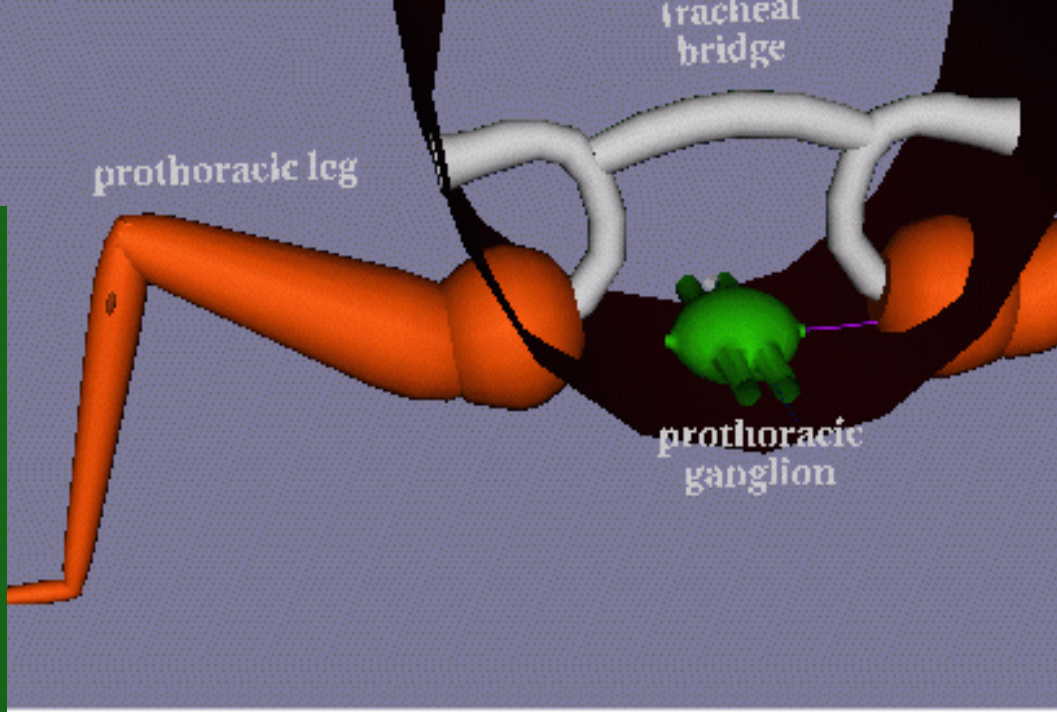
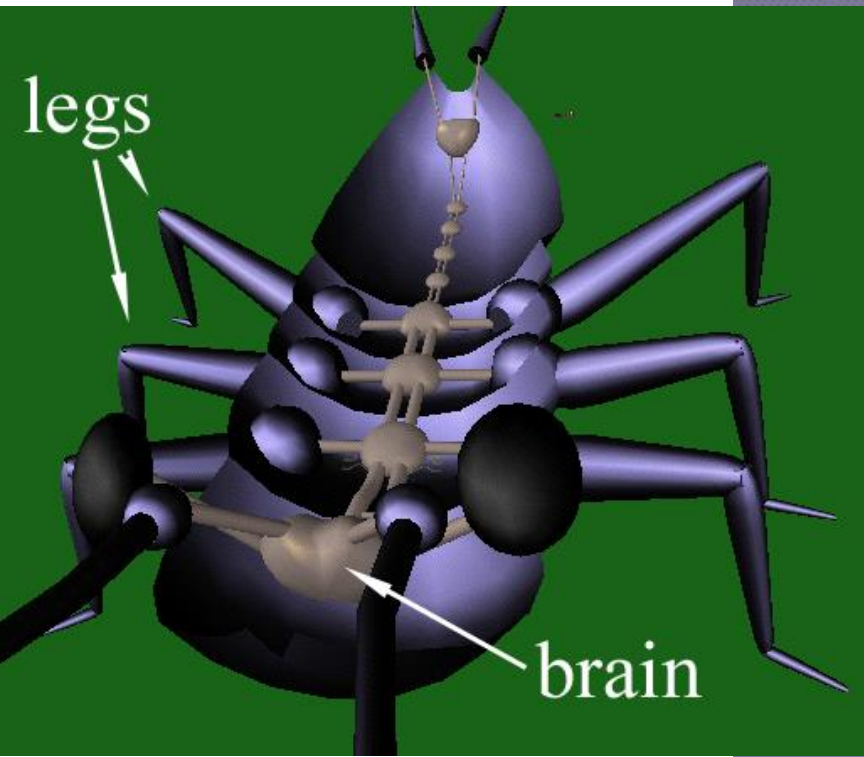
- Web3D started about 20 years ago. At that time we thought that in a couple of years web3D e-learning tools would become a standard, but it turned not to be so.

First there was VRML:

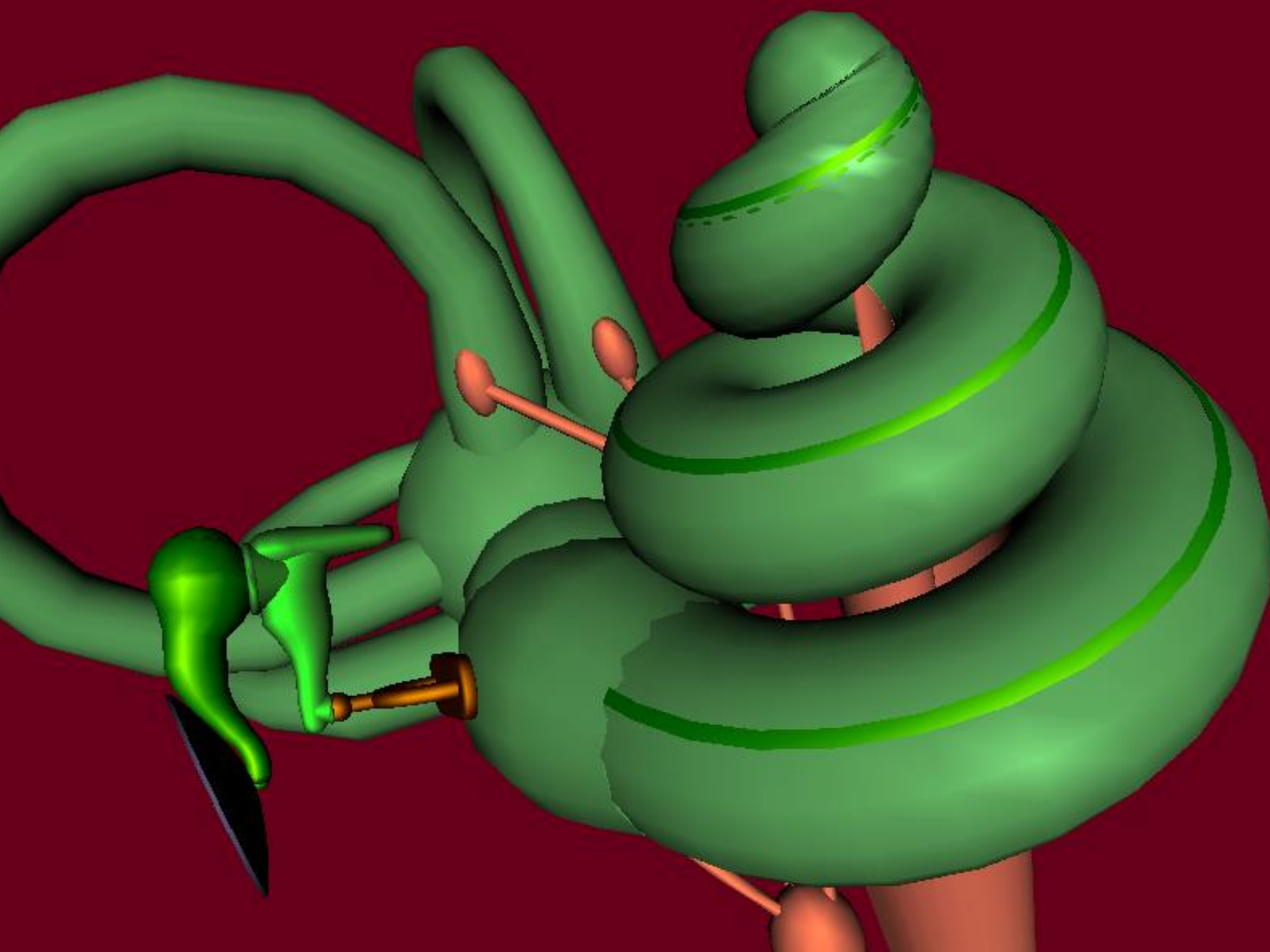
- true open source
- small file size
- easy to author with Cosmo Worlds on Silicon Graphics
- VRML is not supported well today
- It is a kind of Latin language of web3D

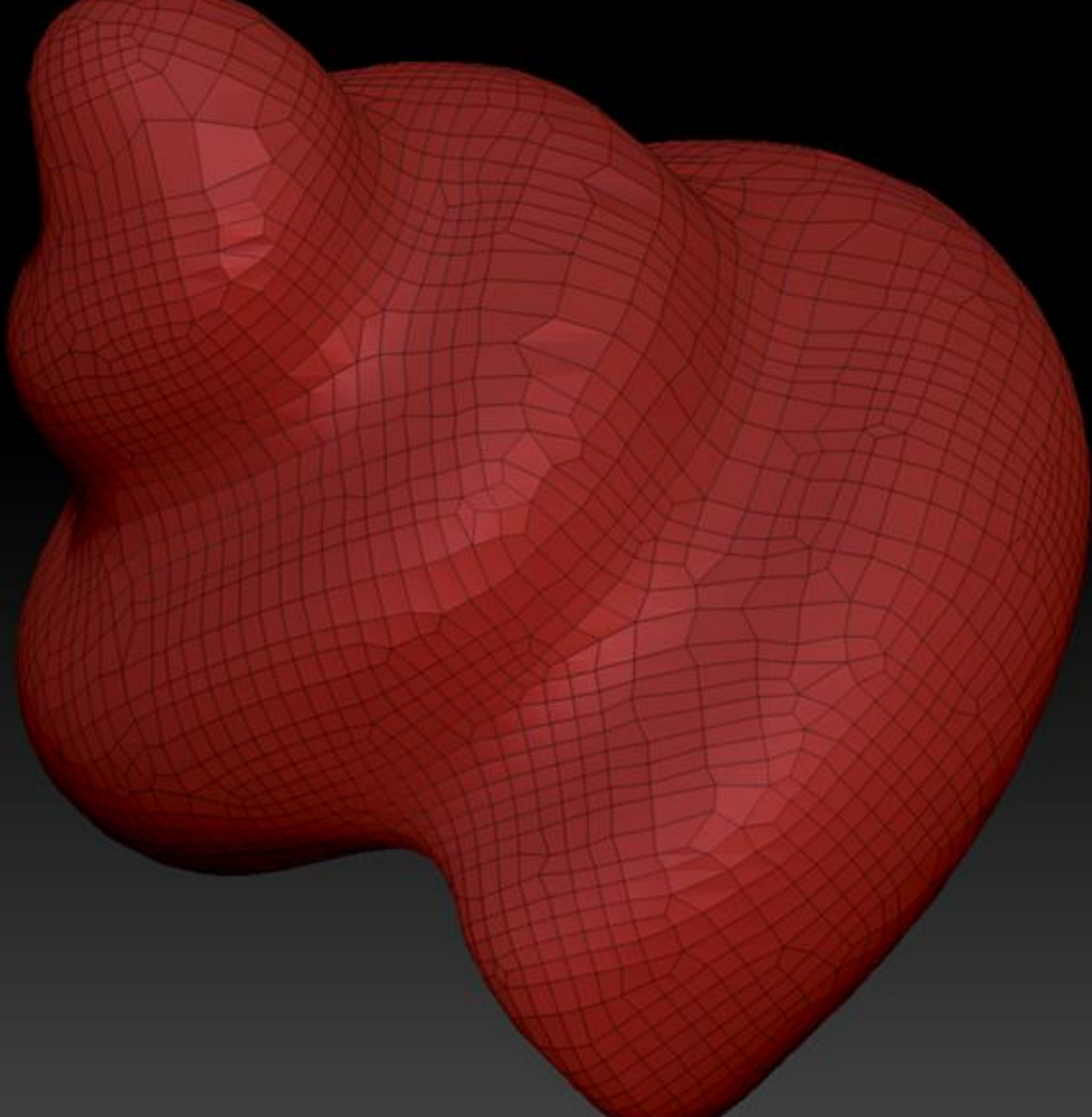


a



WW





Why edutainment?

- Teenagers are used to high-tech computer games and why not to use this habit also for education?
- The textbooks alone are not so useful anymore even if they are basically interactive.

I want to play a game and then
maybe learn also something.

or...

I want to learn with a modern tool
and sometimes also play in order to
learn more efficiently and not get
bored or sleepy.

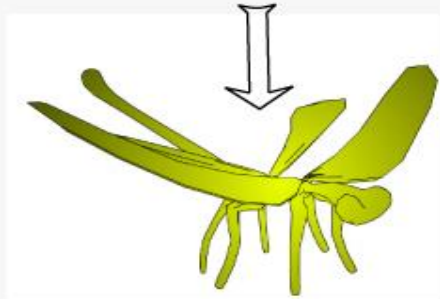
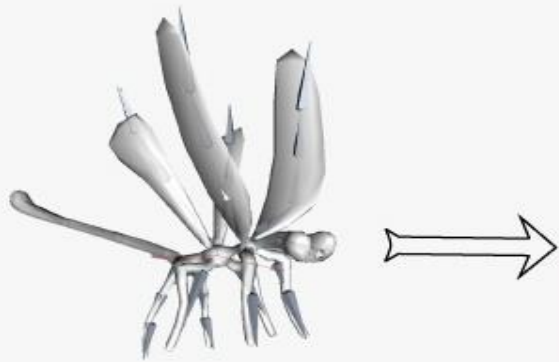
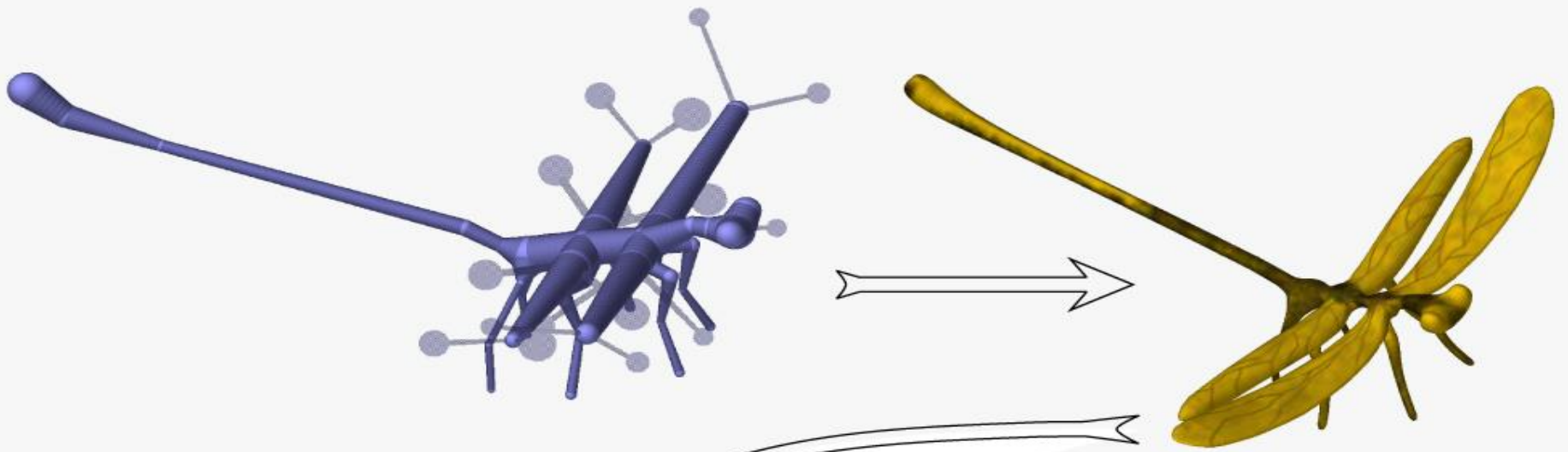
www.bioanim.com

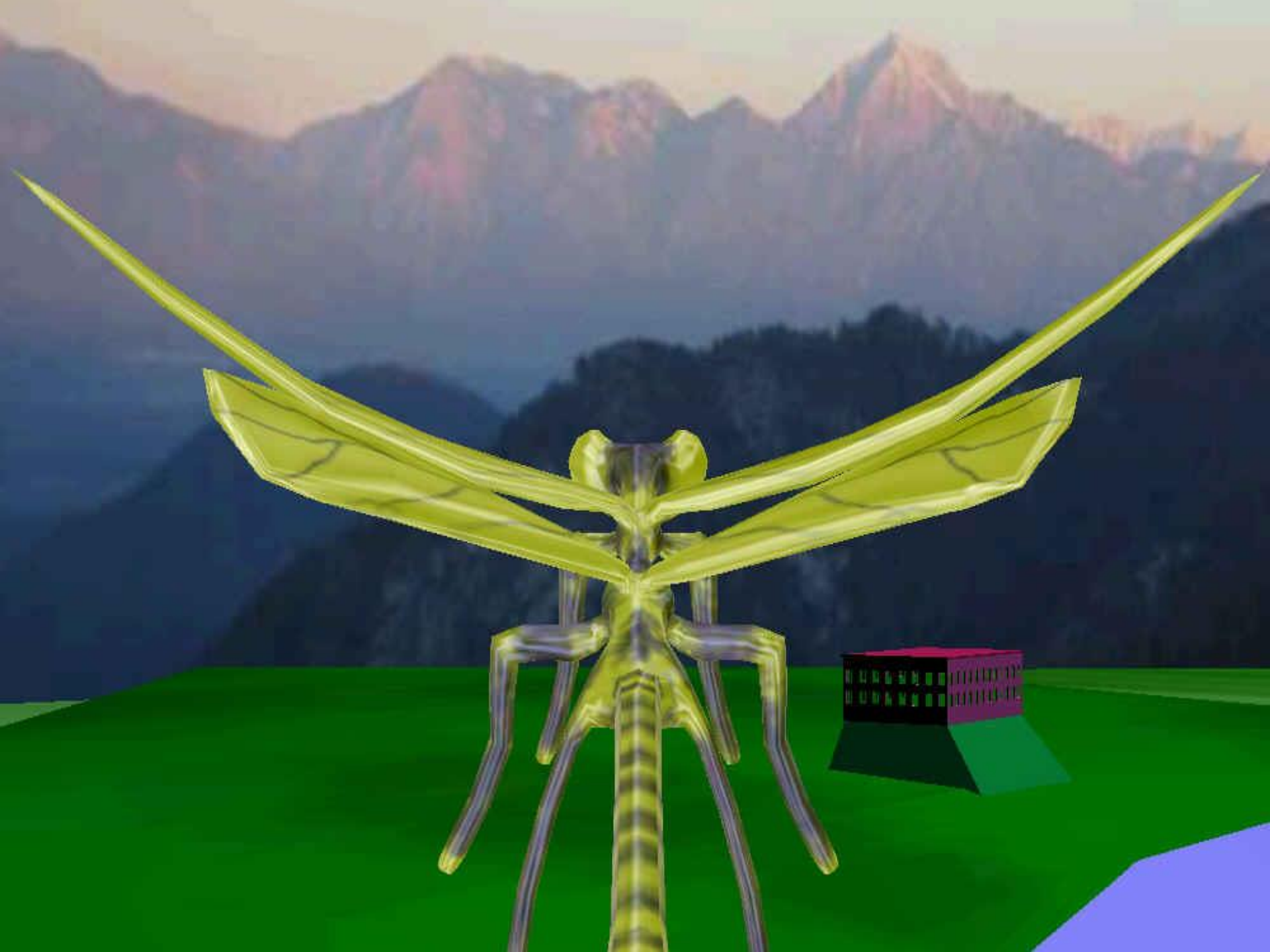
We primarily explore the second option -

So we develop tools that help the students who already have motivation to study, but they want to study in a modern and exciting way.

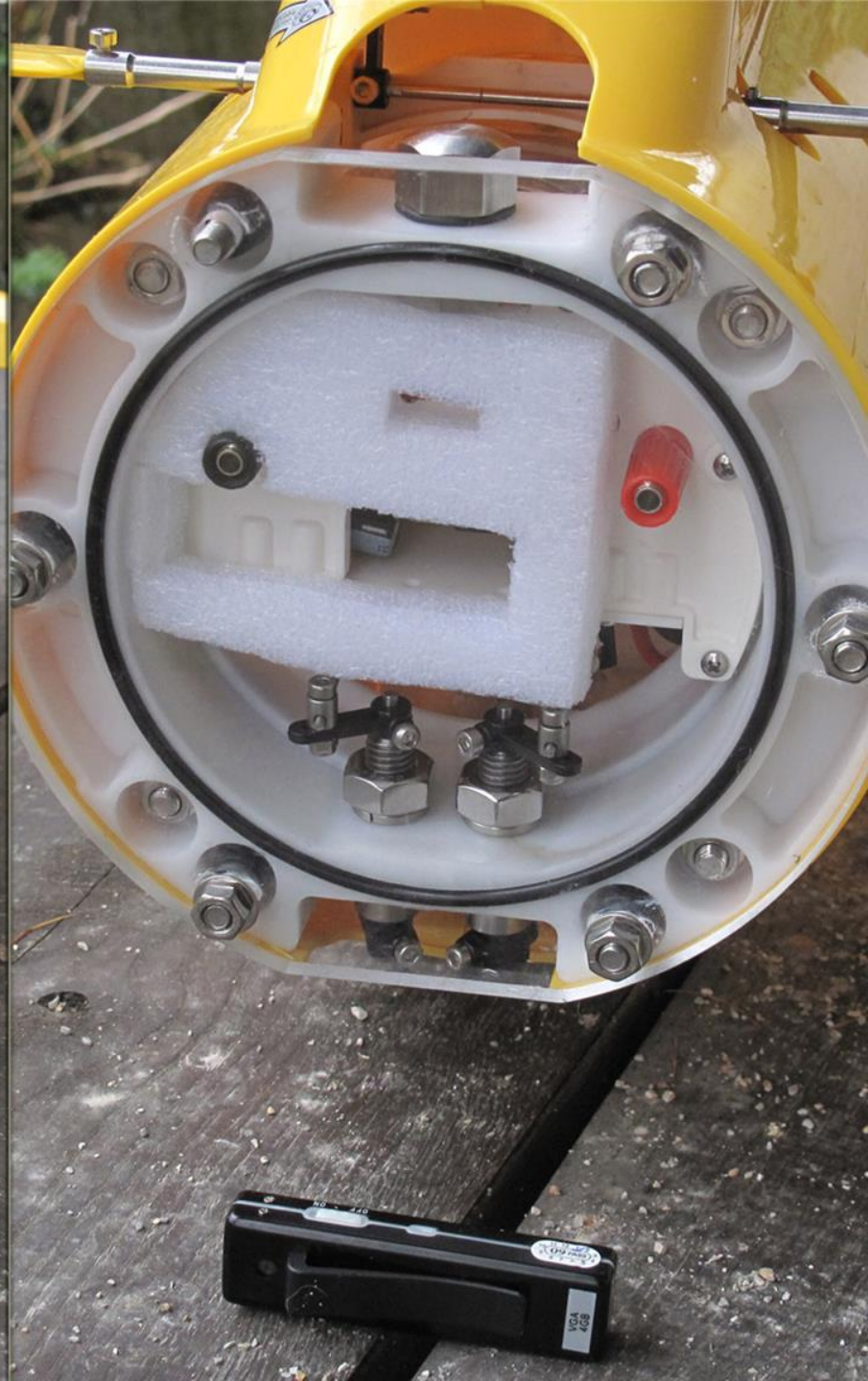
We prefer doing the virtual reality
(3D, web3D) projects,

Because they explain well the
nature and invite us to explore and
play at the very beginning.













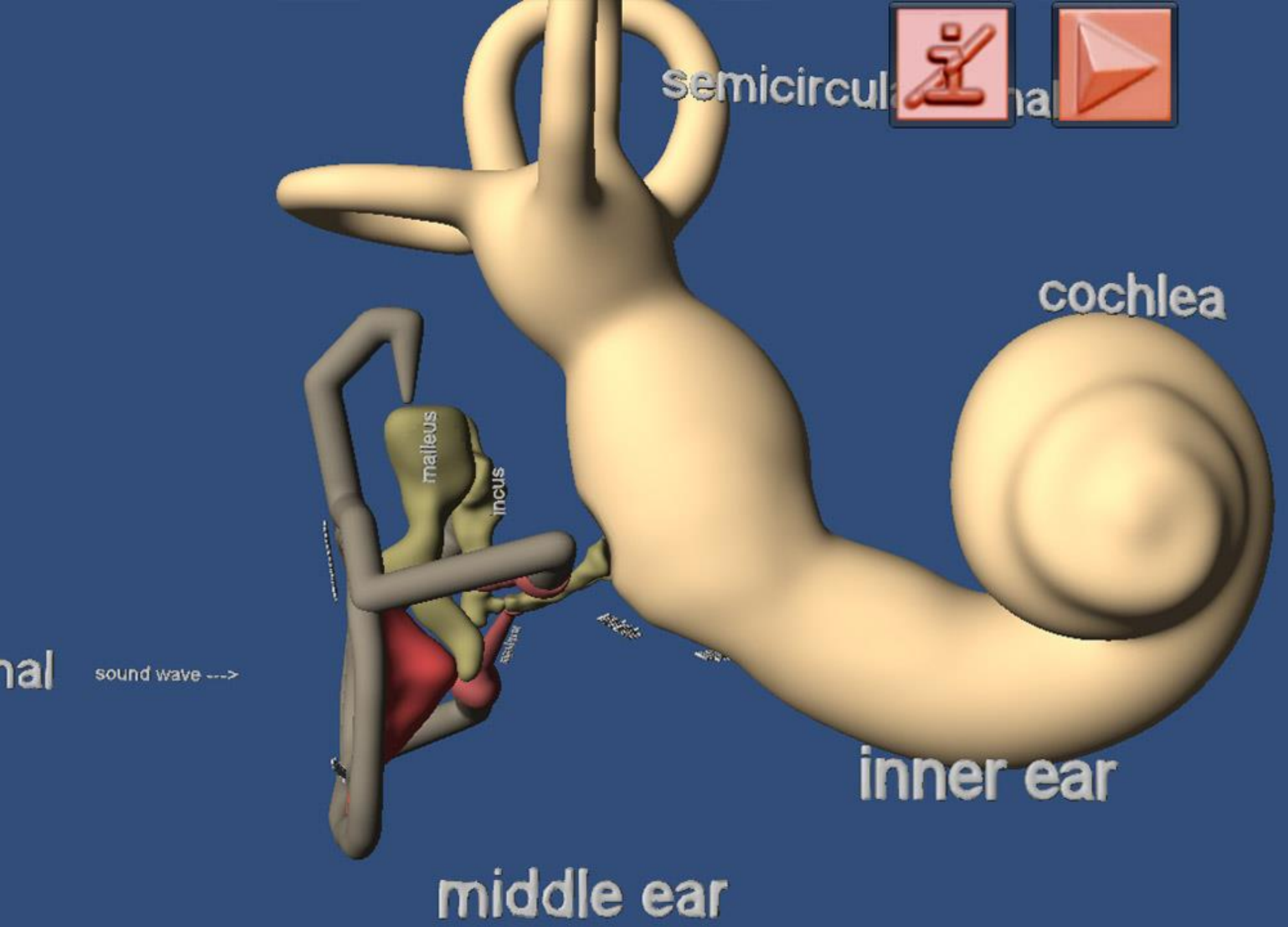


Computer Tablets -
Probably the Optimal
Devices for Science
Education in Virtual
Reality Today ?

- Tablets like Apple iPad, Android and Windows 8 tablets as well as smartphones with larger screens are very popular today. At the same time they are also powerful computers.

- The tablets are wonderful devices for learning in virtual reality since one can navigate with fingers naturally and intuitively in the 3D world.

- We produced several applications about the cell structure and function like :
- Metabolism and motor proteins as well as
- Structure and function of some sense organs like human eye, ear and
- Proprioceptors (muscle spindle and skin receptors).





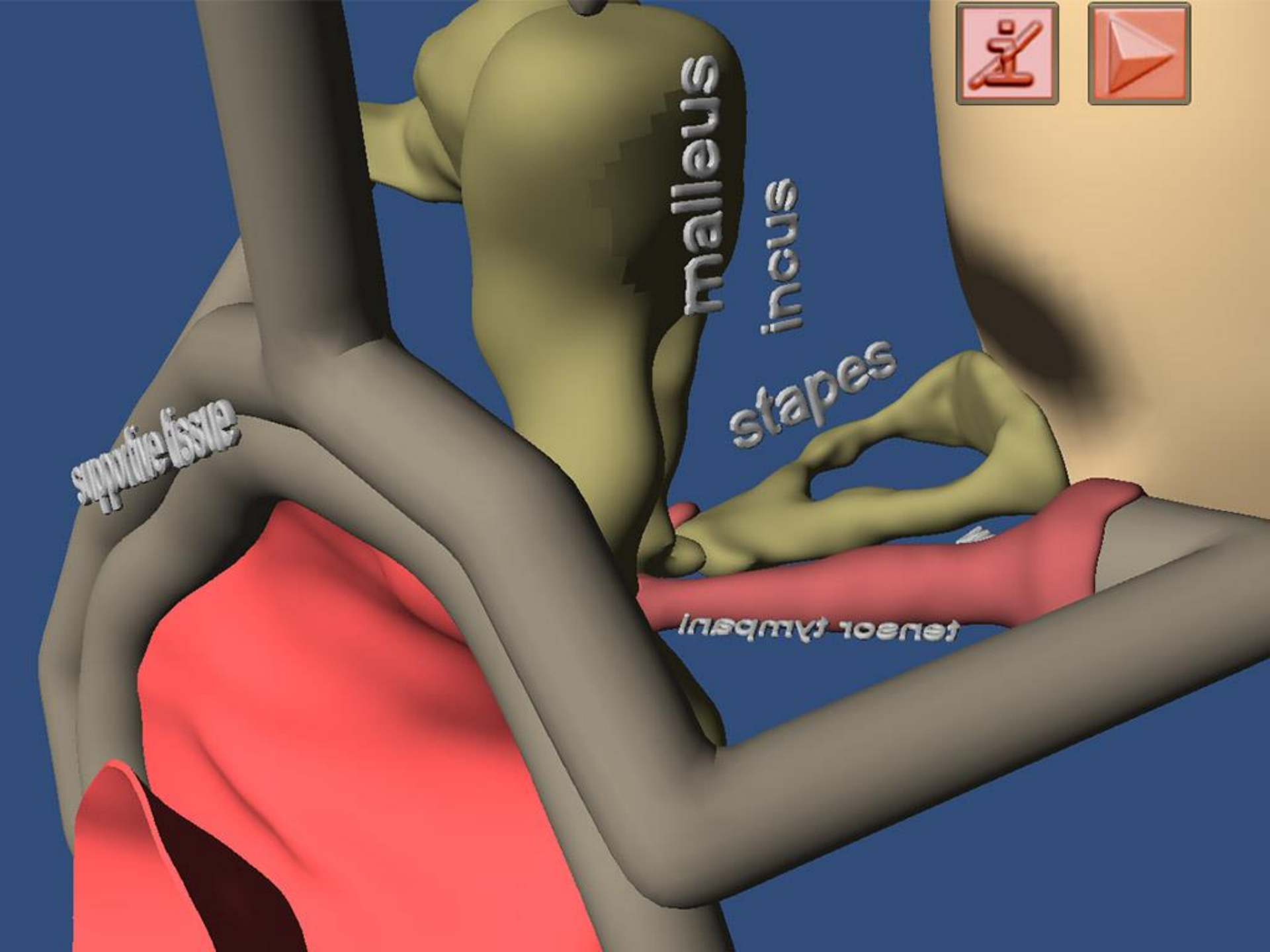
malleus

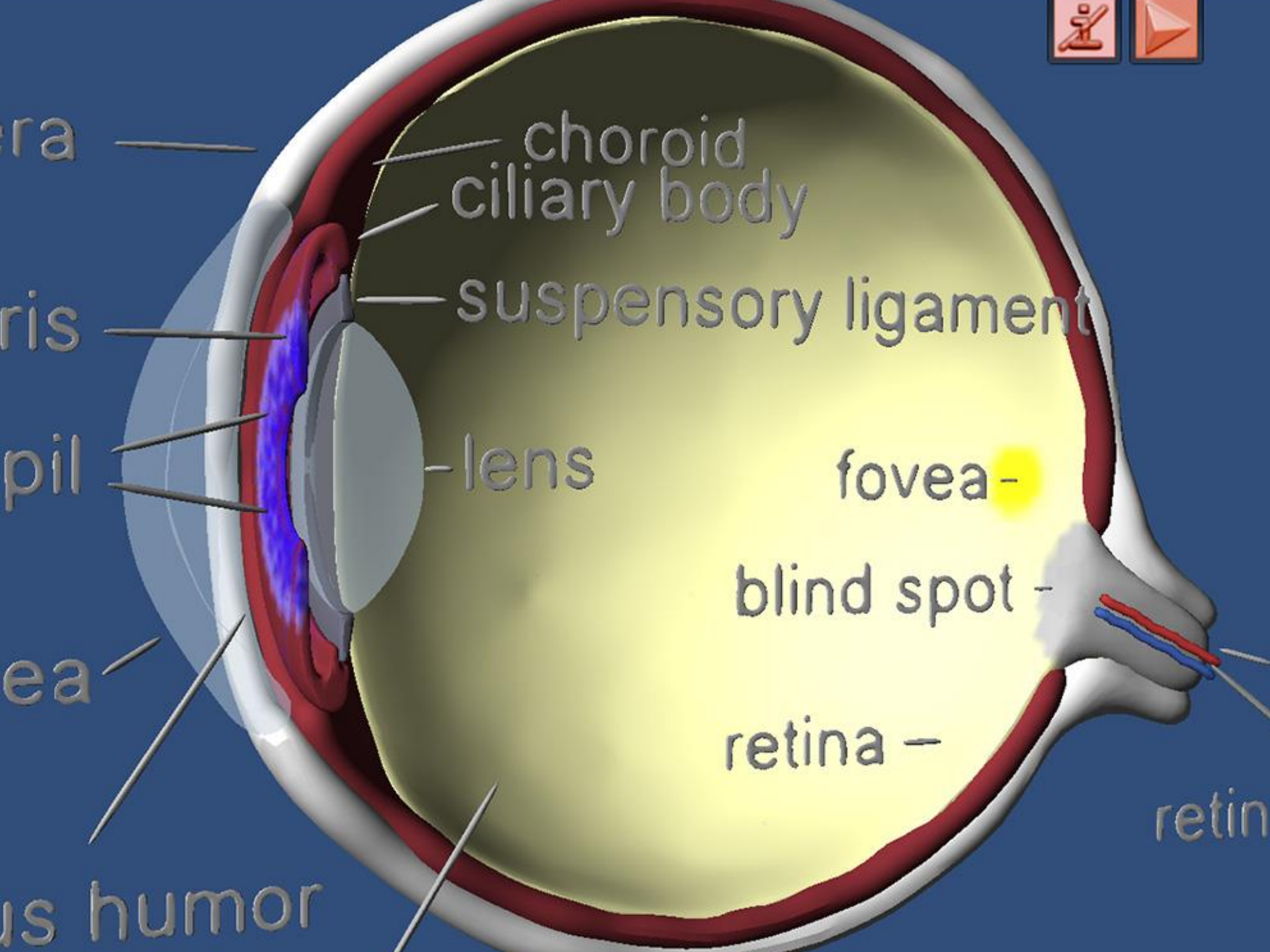
incus

stapes

supraorbital fissure

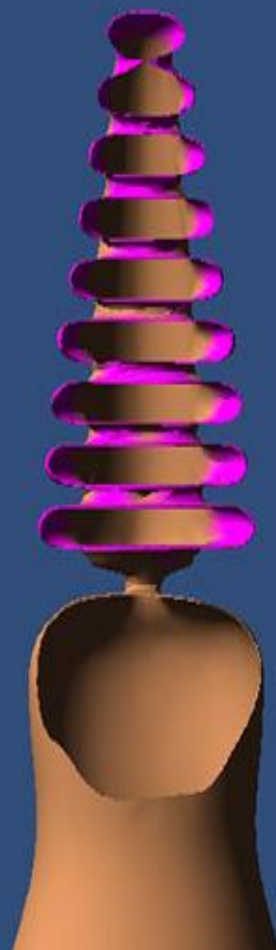
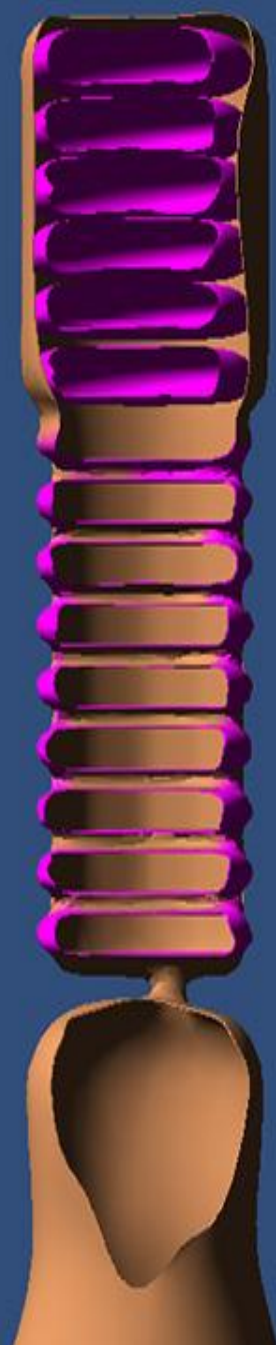
tensor tympani



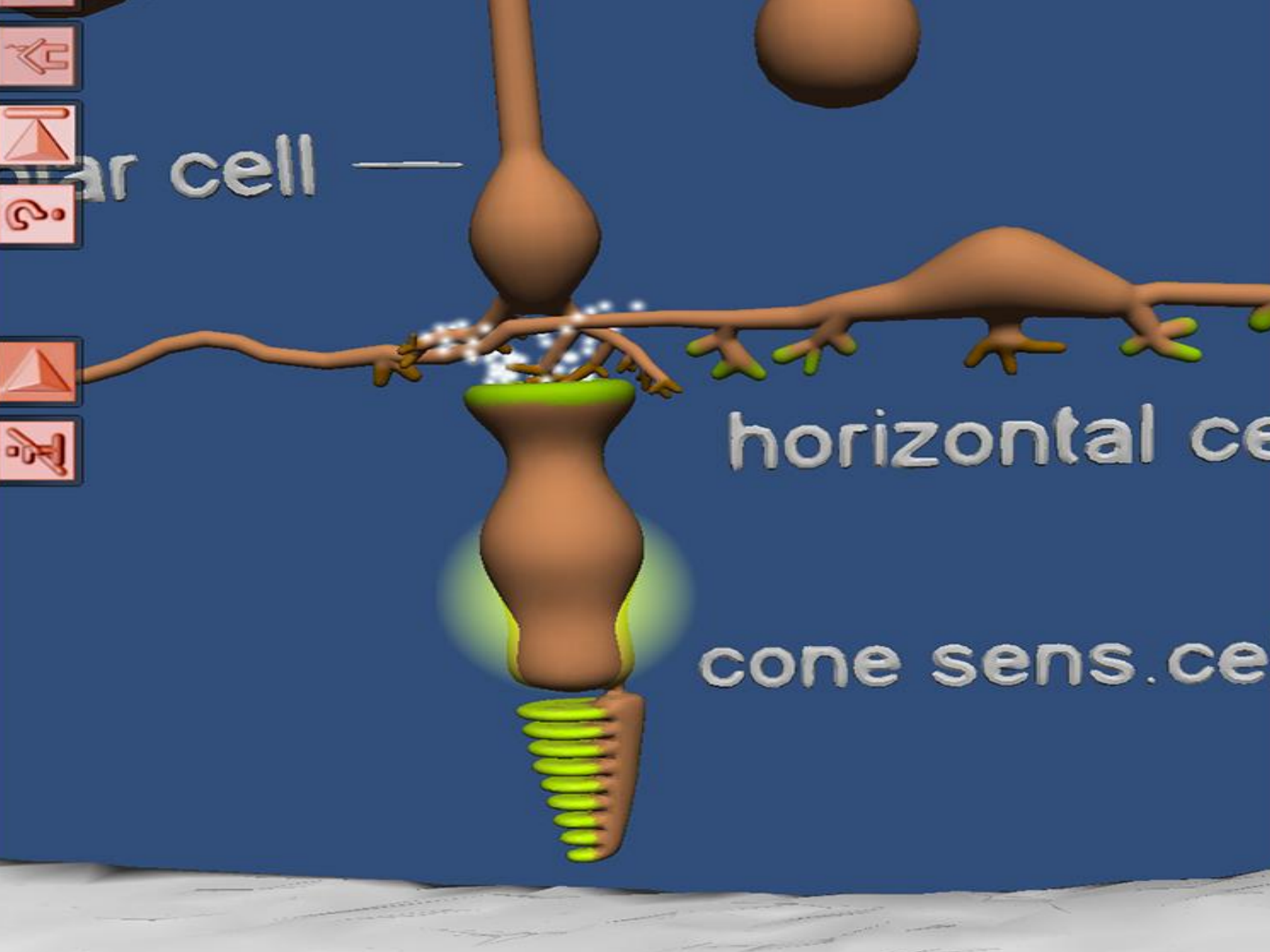


out connection
rod membrane

disks connected
rod membrane



disks connected
to cone membrane

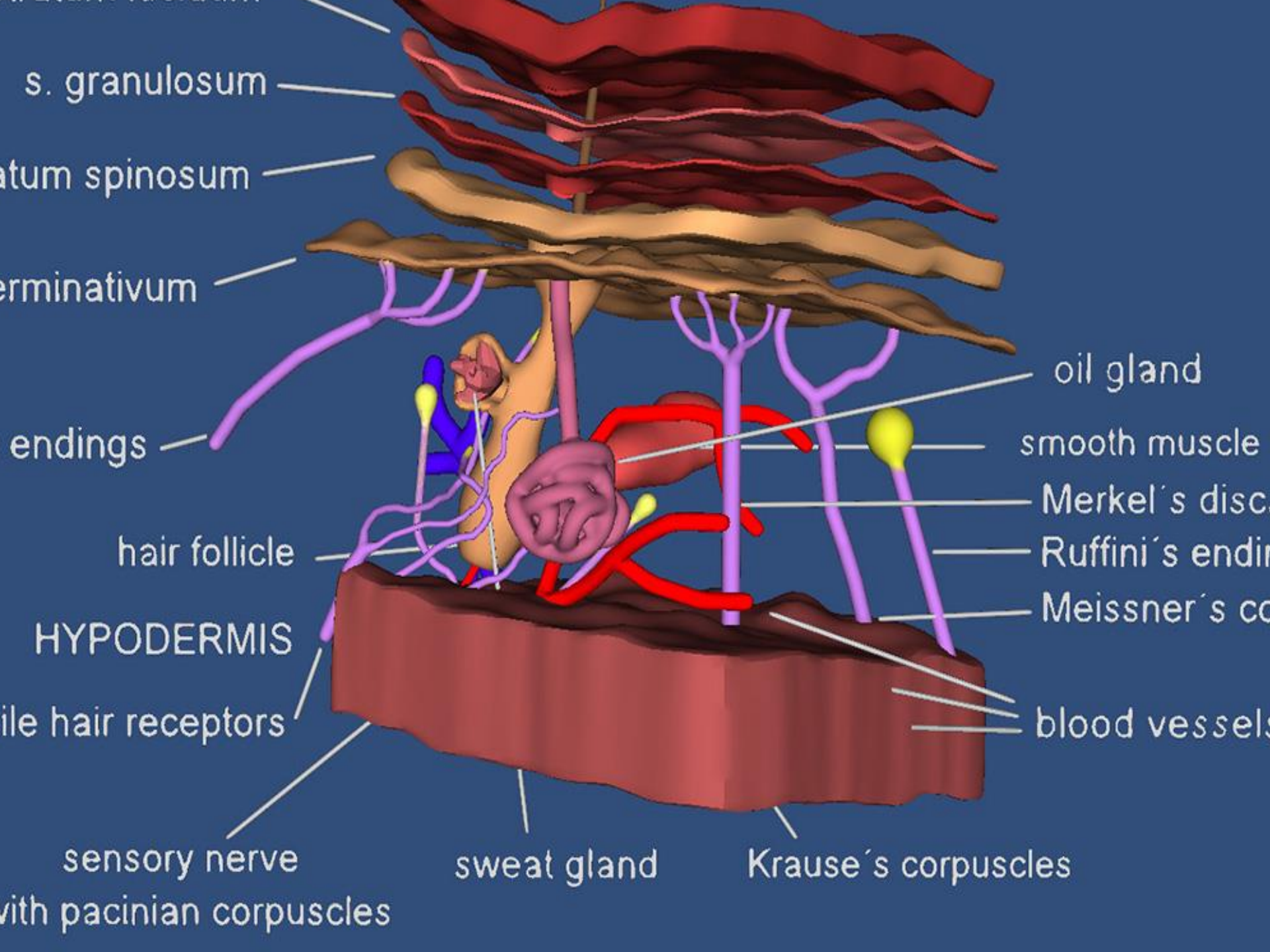


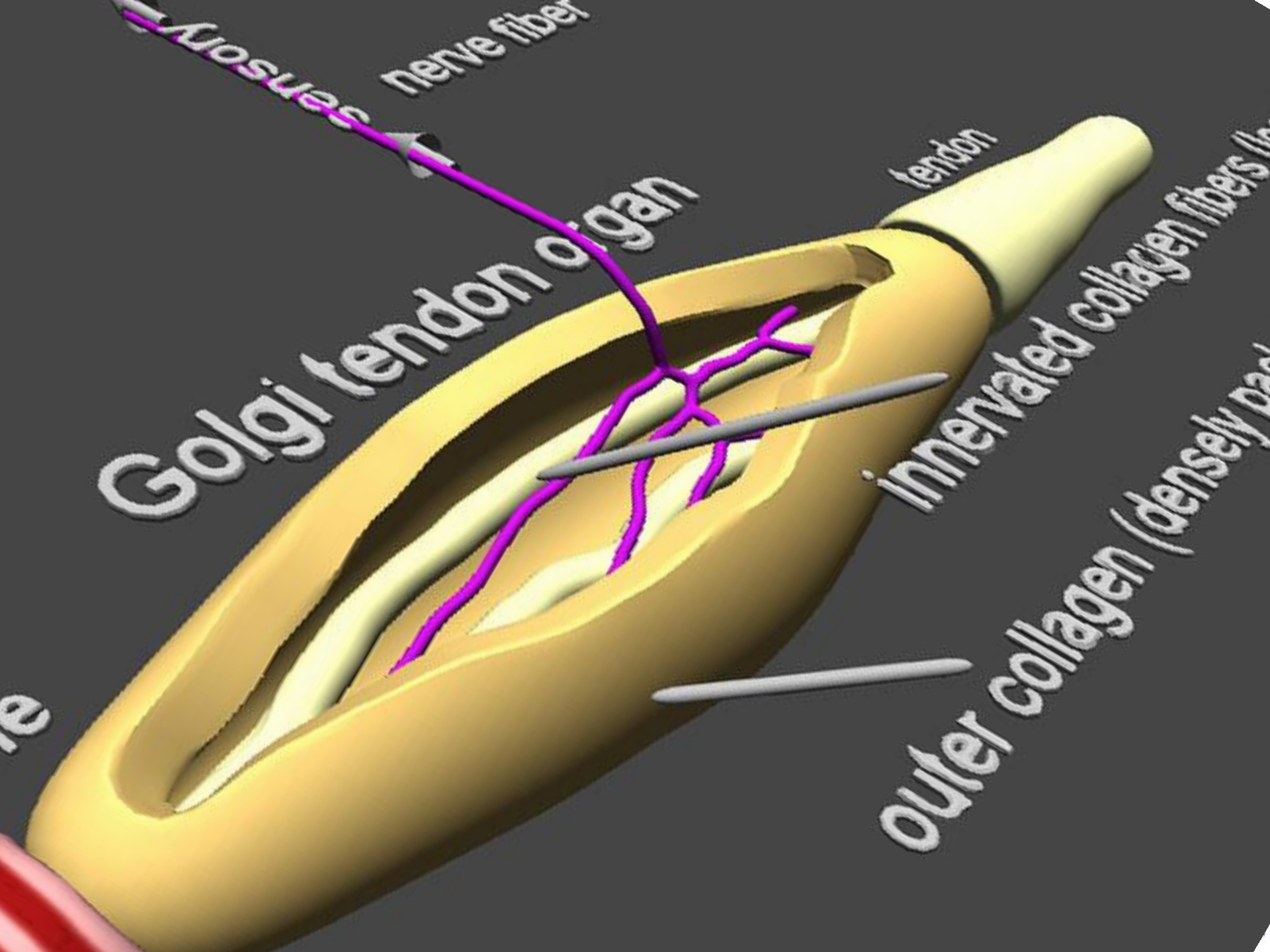
rod cell

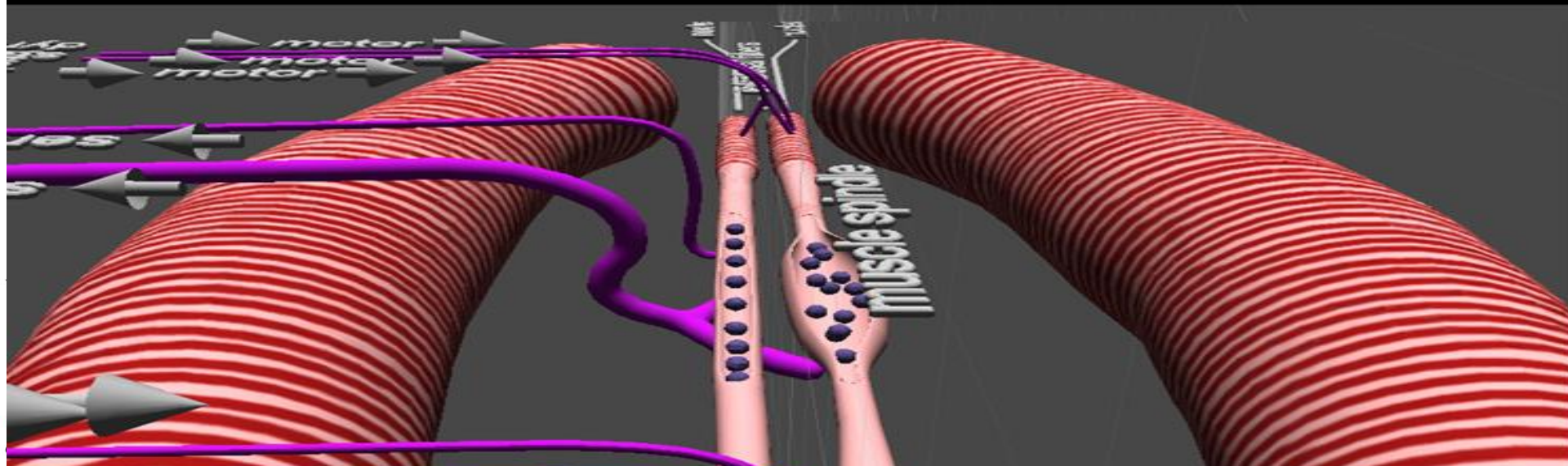
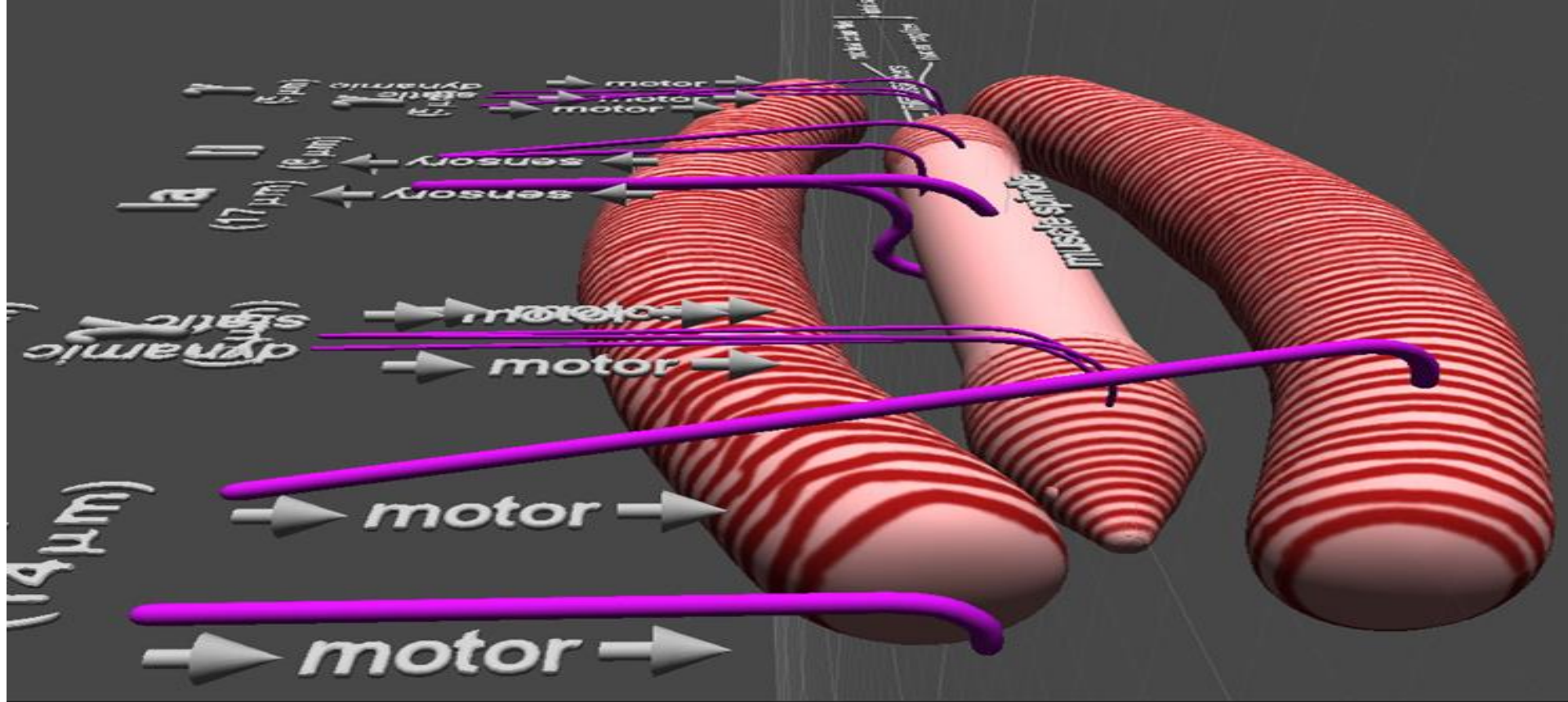
horizontal ce

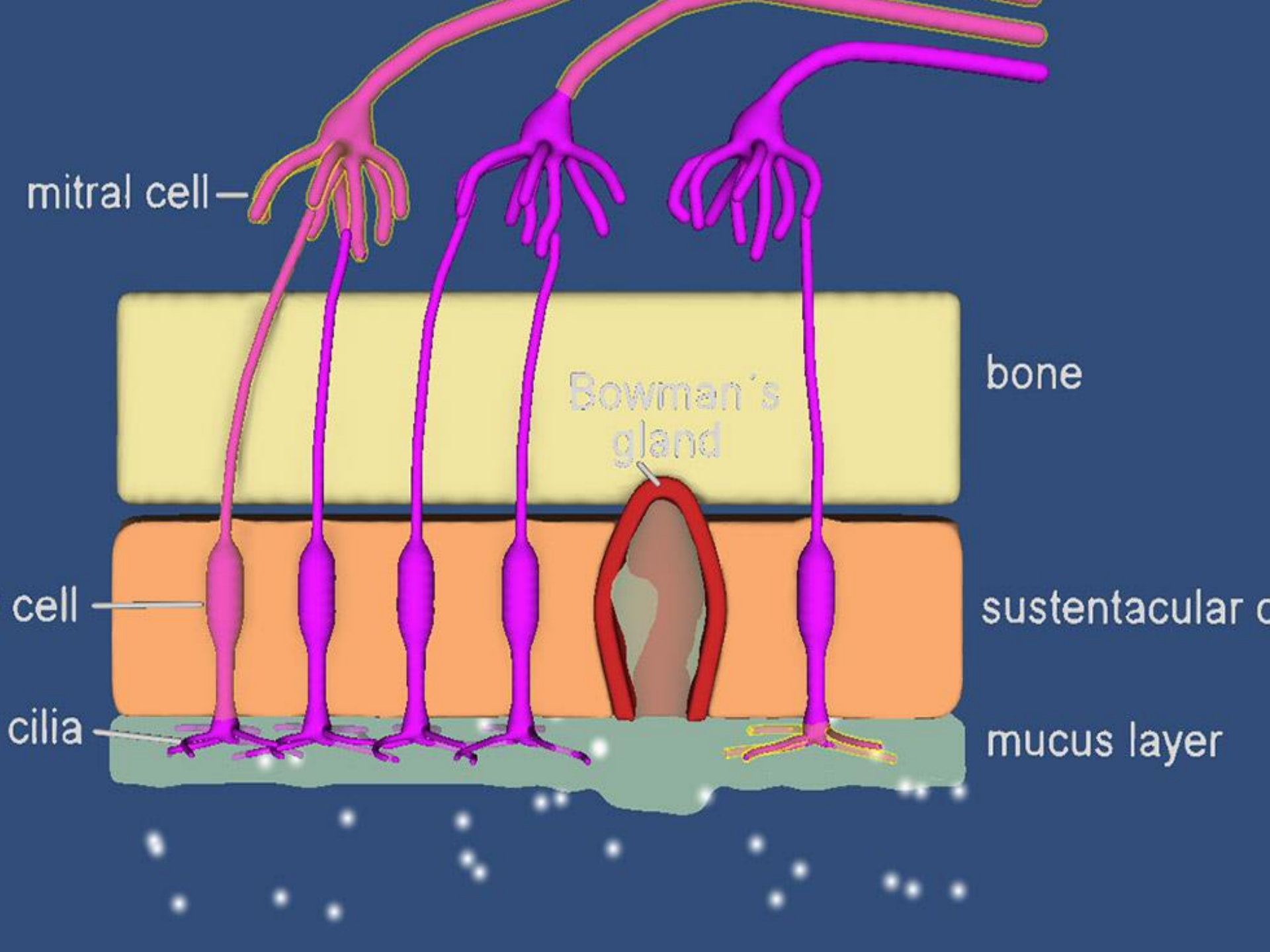
cone sens. ce

- Clearly this virtual reality world is not just like a video. The user can at any time press the "diver" button and so discover along with the animated camera the scene also by himself.

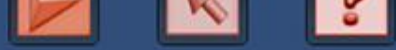








- Our intention is to make the learning session as simple as possible,
- in other words, one should spend as little time as possible with our software session.
- Above is in contrary to the classical game flow.



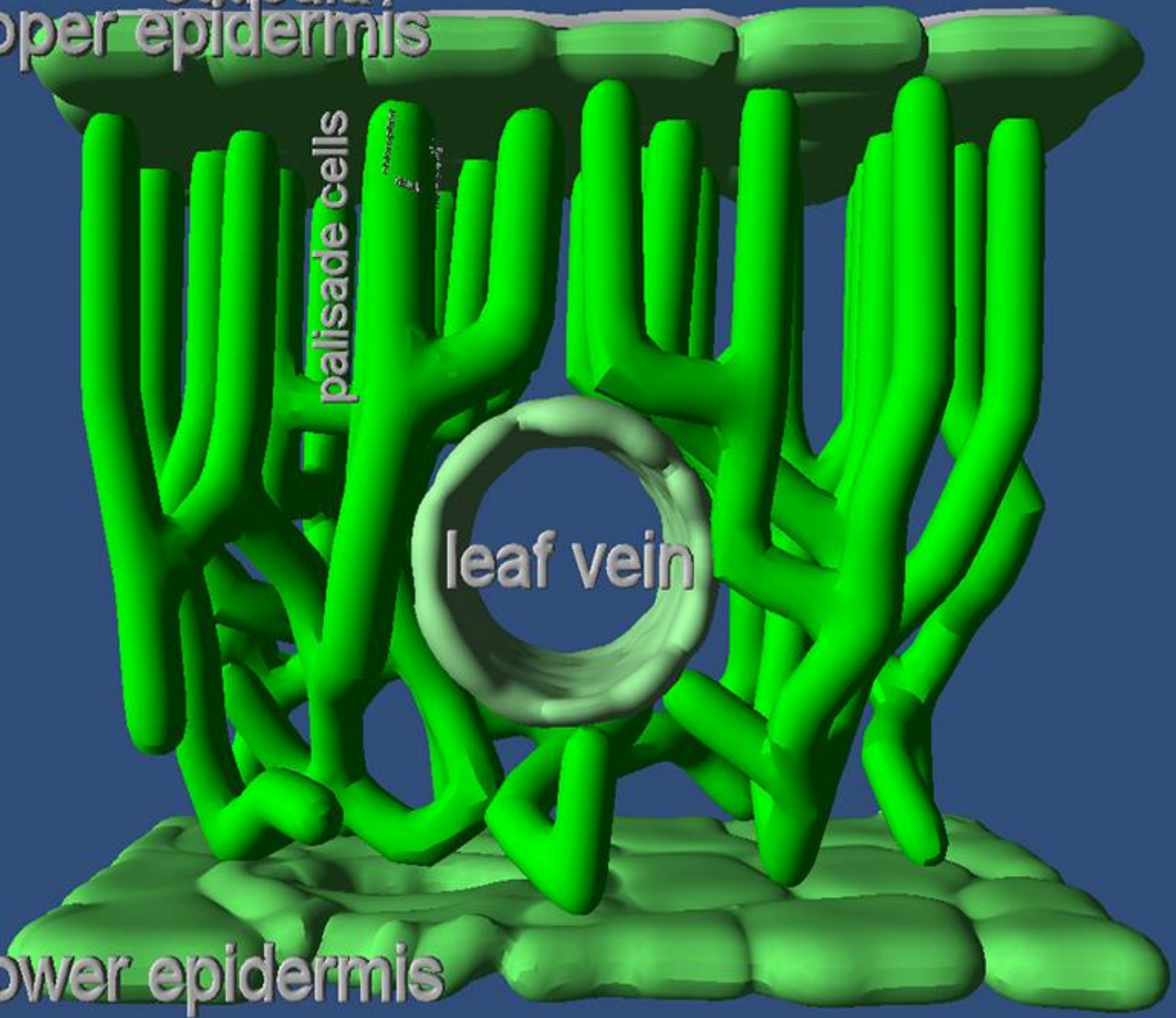
cuticula
upper epidermis

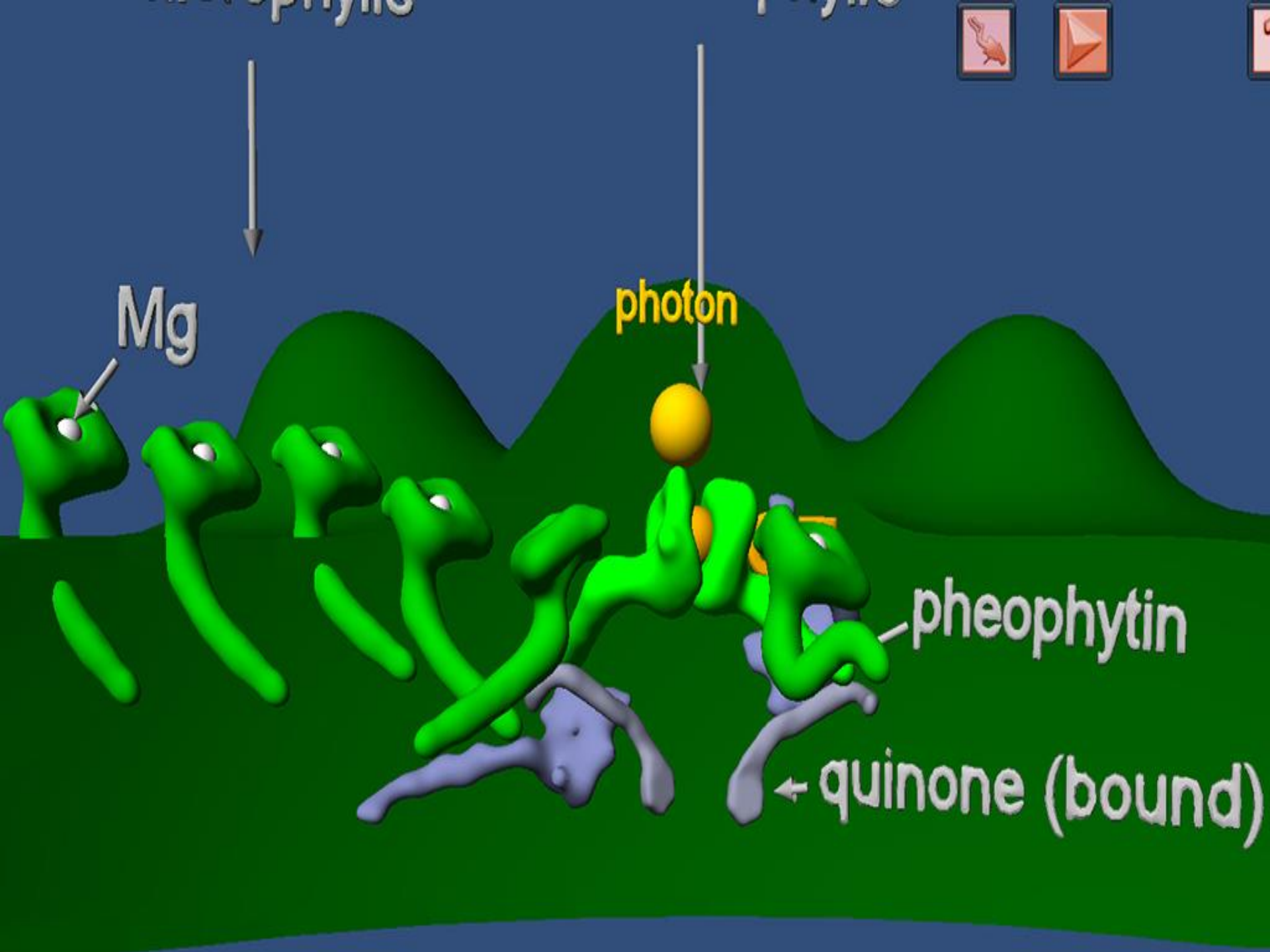
palisade cells

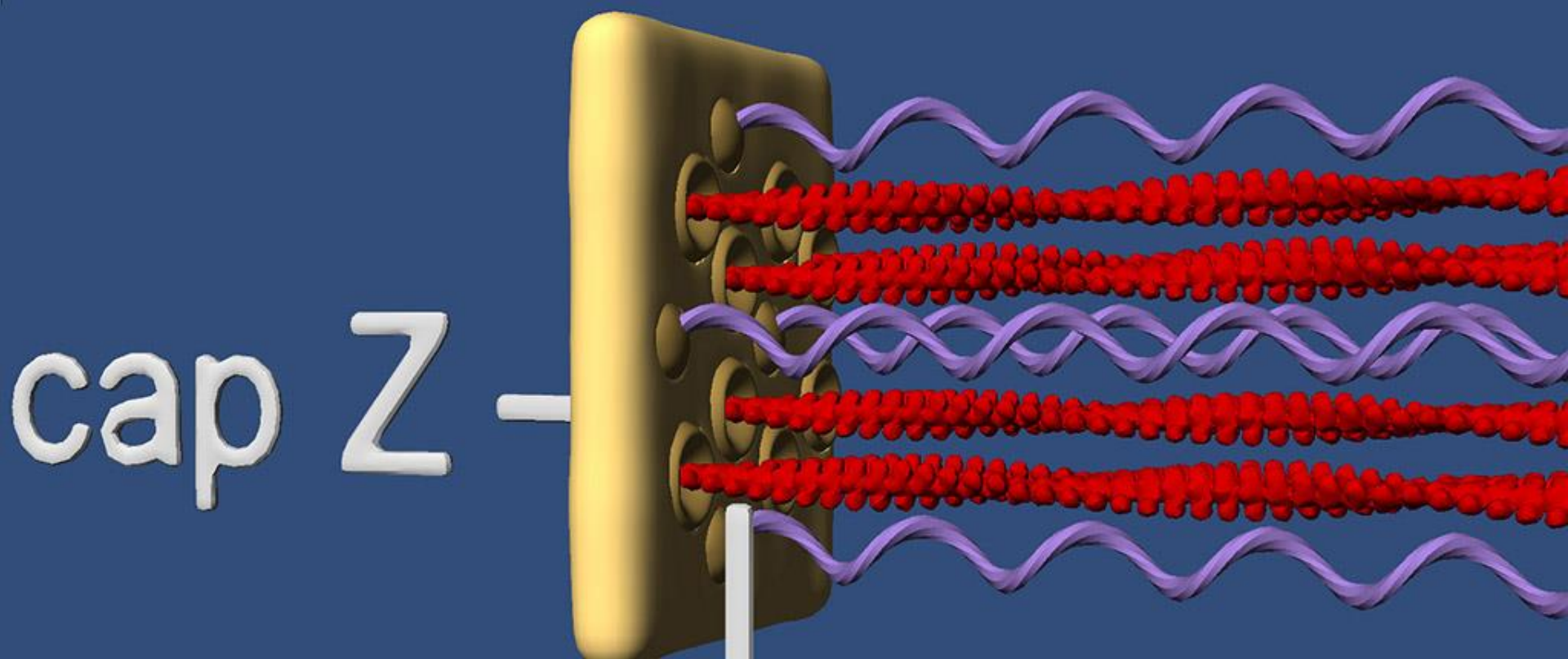
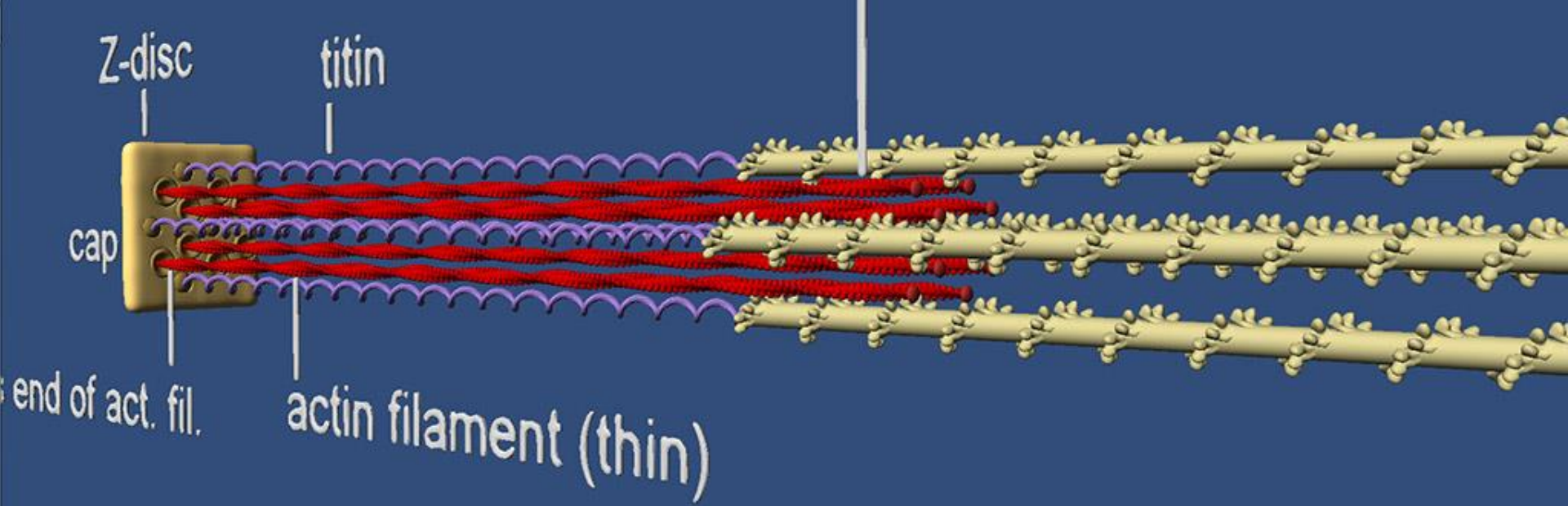
leaf vein

mesophyll

lower epidermis



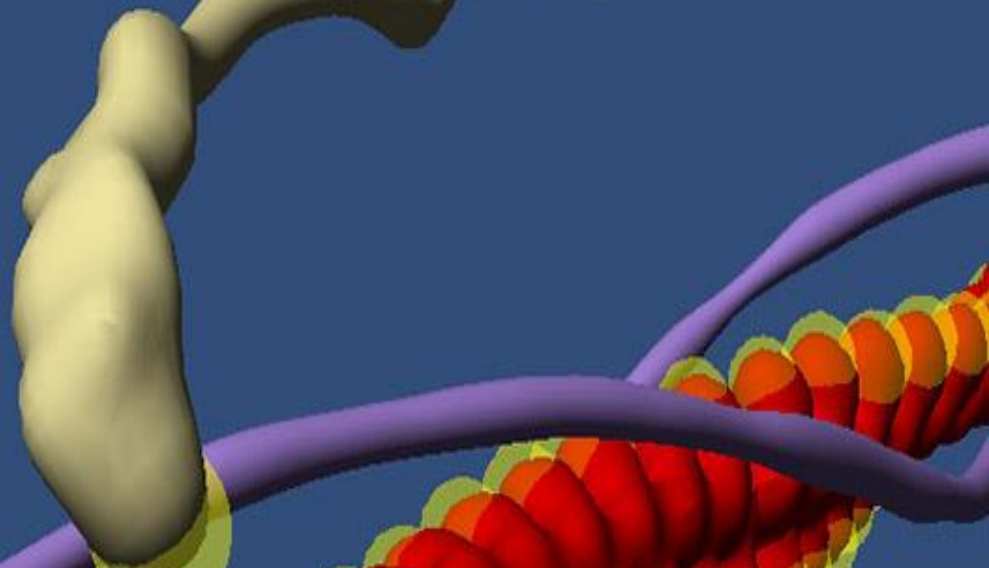




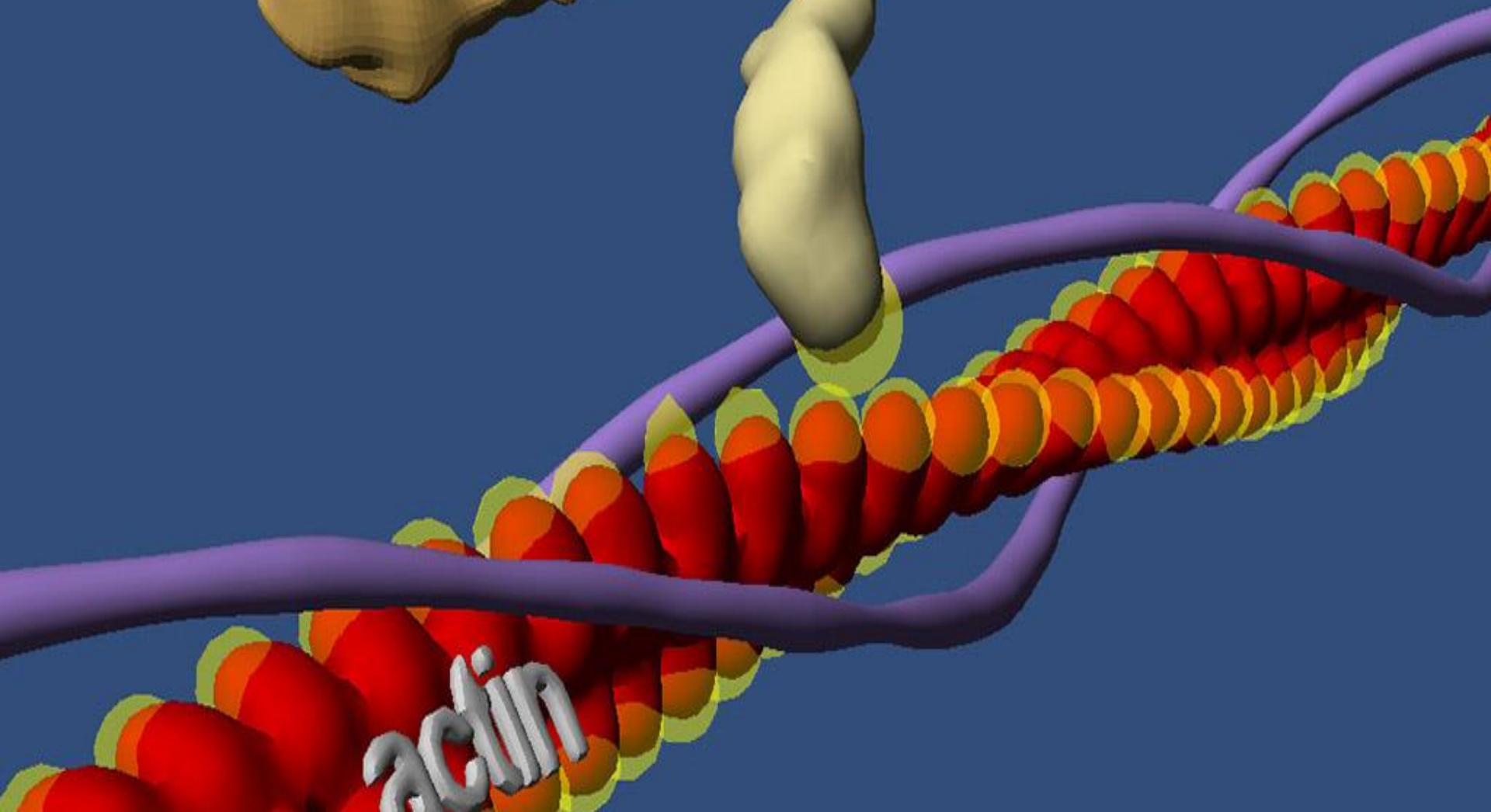
actinin



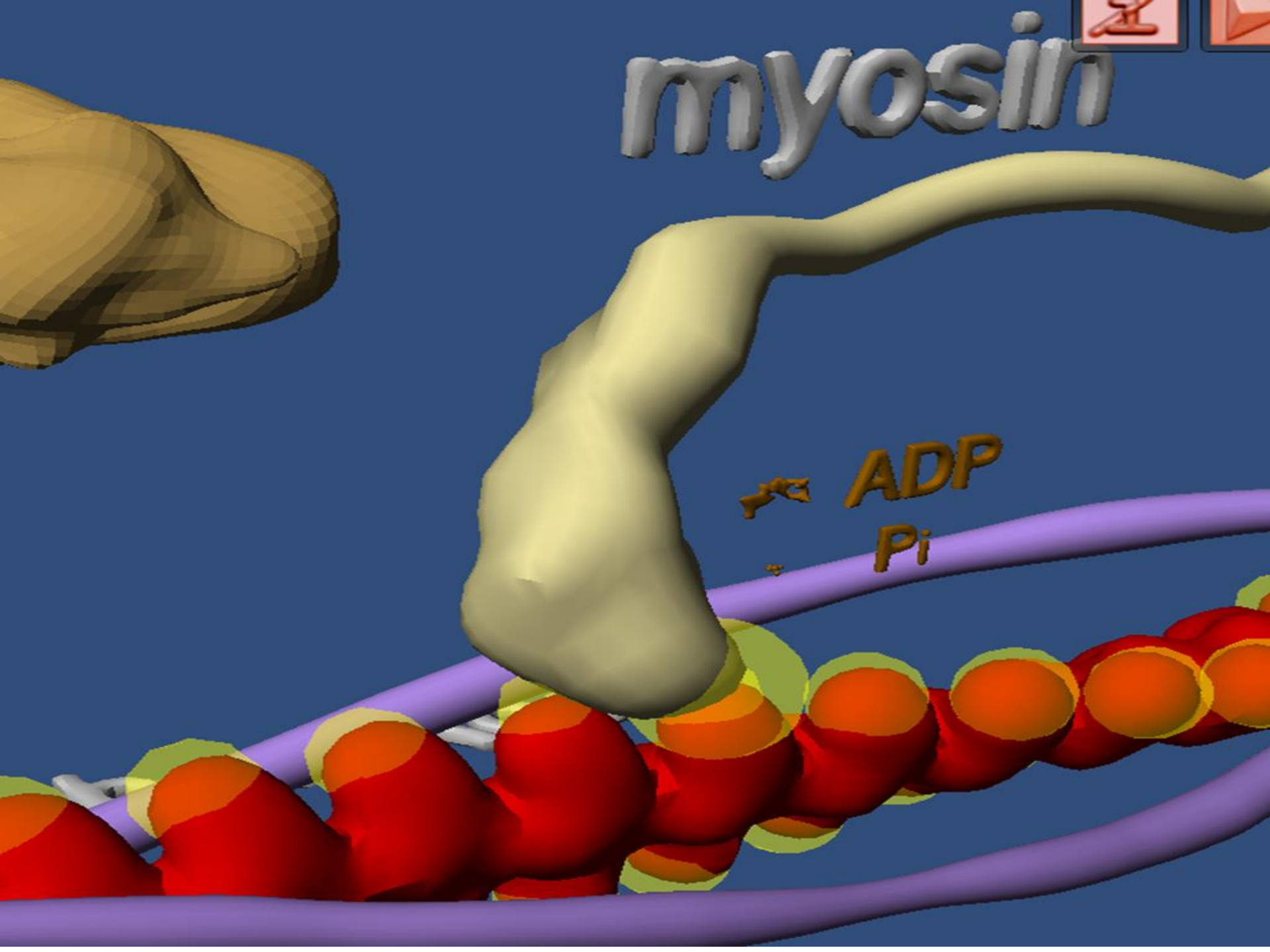
myosin



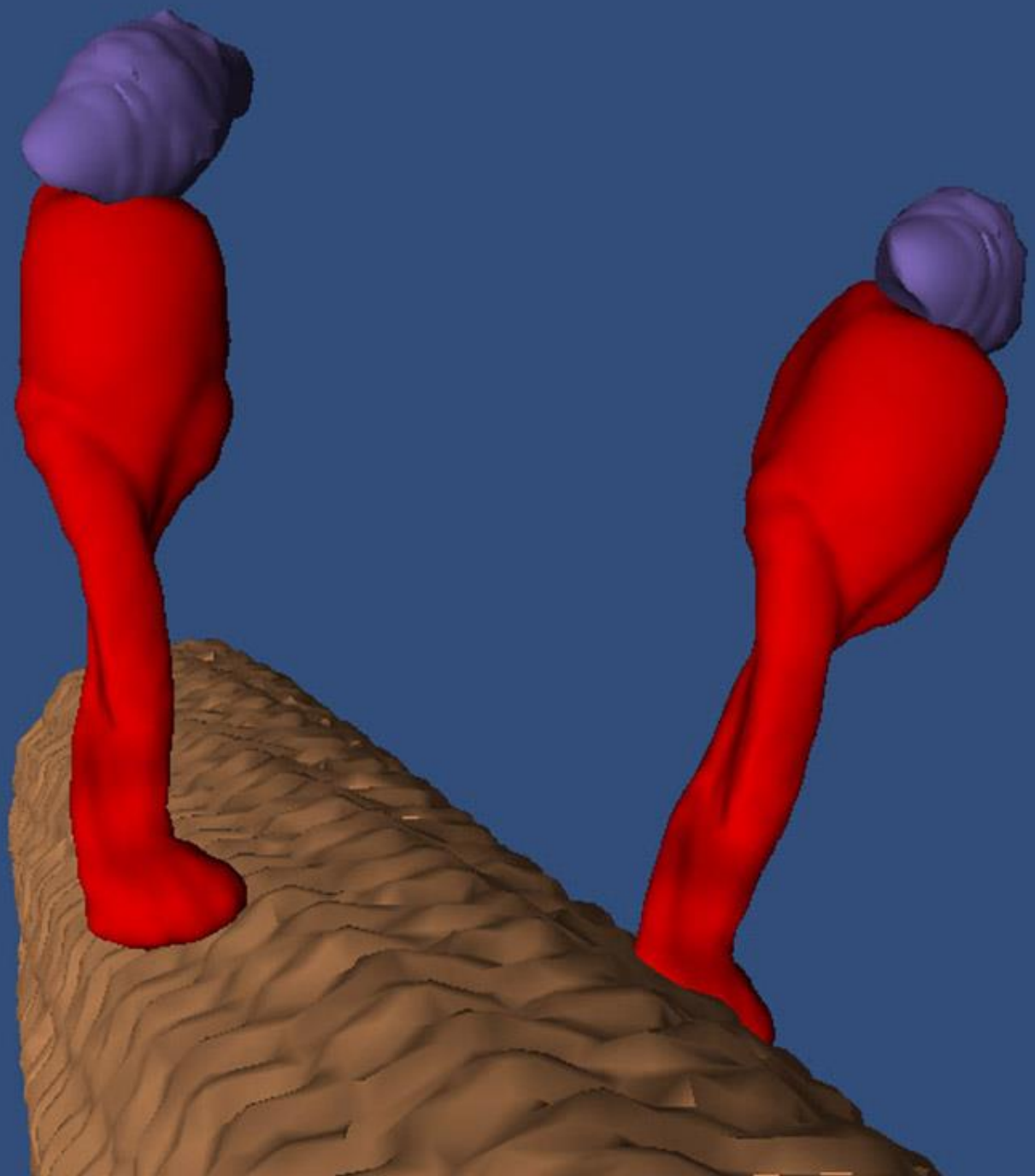
actin



myosin



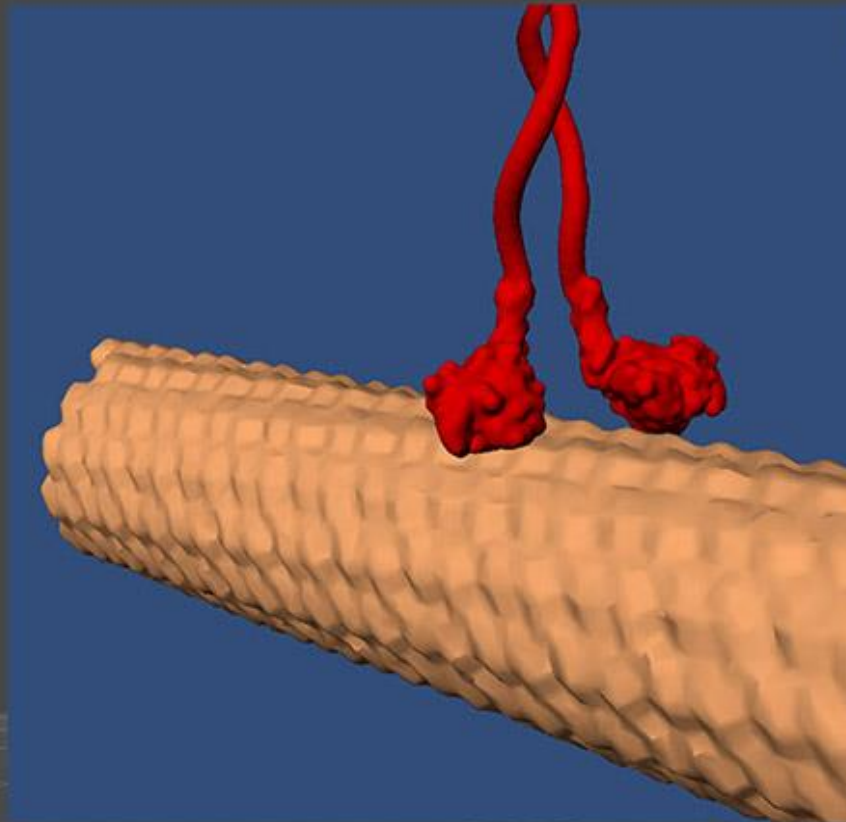
ADP
Pi



carried vesicle

kinesin

microtubule



- Anyway the real virtual reality worlds provide a special and unique user experience. They attract you almost like a computer game. In addition they also provide an excellent tool for the teacher in order to enrich his or her lectures.



Gut Microbes Battle Microbiome Game

Gut Microbes Battle Microbiome Game

- The microbes in our gut are both our helpers and possible enemies.
- In this game you get the idea about this important and complicated microbiome by playing an attractive game in 3D virtual reality.
- This is a kind of a stealth game. You are represented in this 3D world as an avatar finding yourself in the cross section of the gut with mouth somewhere above you (not visible).





Gut Microbes Battle Microbiome Game

- So the food transport occurs from top to bottom and you soon encounter e.g. a cucumber that lands on your level and small bears (=healthy food particles) start to march out of it to the gut wall having for their goal the factory which denotes the metabolism and biosynthesis. There they enable the creation of the elephants - macrophages - which jump towards you and circle around you in order to protect you.



Gut Microbes Battle Microbiome Game

- You have also another way of getting your protection. If you bump into the good food that has descended, bunnies come out of it. They stand for antibodies killing the evil antigens just like the macrophages also kill the antigens. However when you bump into bad food the antigens (small white combatants) emerge and start to shoot around. The antigens come also out of the harmful food or bacteria you swallowed - denoted here by the battle bus.





AUGMENTED REALITY

=

VIRTUAL REALITY
COMBINED WITH
THE REAL WORLD





w

Cen

ADD 3D PRINTED
OBJECTS TO
ENHANCE THE
LEARNING PROCESS



W

Cent







Let's Learn

in Nature !









**VIRTUAL REALITY
IS NOT VIRTUAL
BUT THE NEW
REALITY OF THE
FUTURE TO COPE
WITH !**

Jean-Pierre Pennec, Centre Européen de
Réalité Virtuelle Brest France

Thank you.

**Tomaz Amon
Center for scientific visualization**

tomaz.amon@bioanim.com

www.bioanim.com