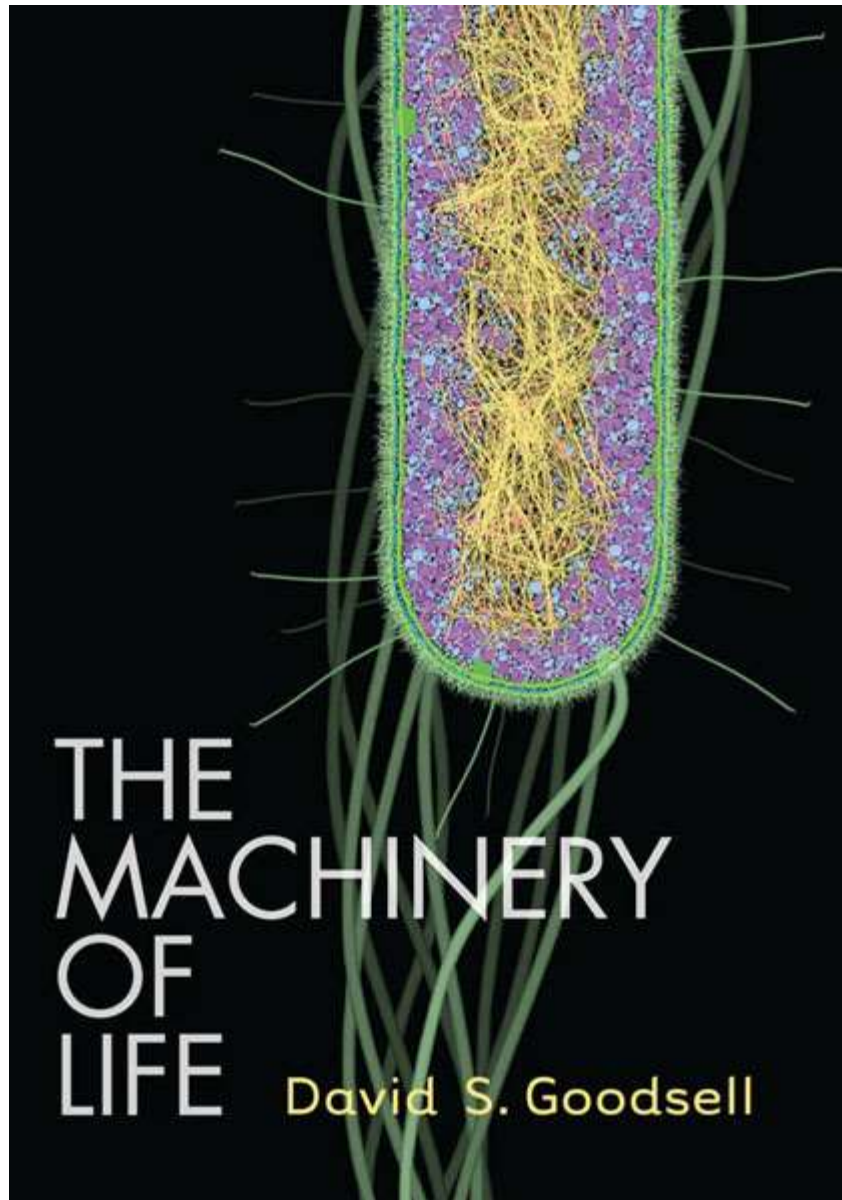


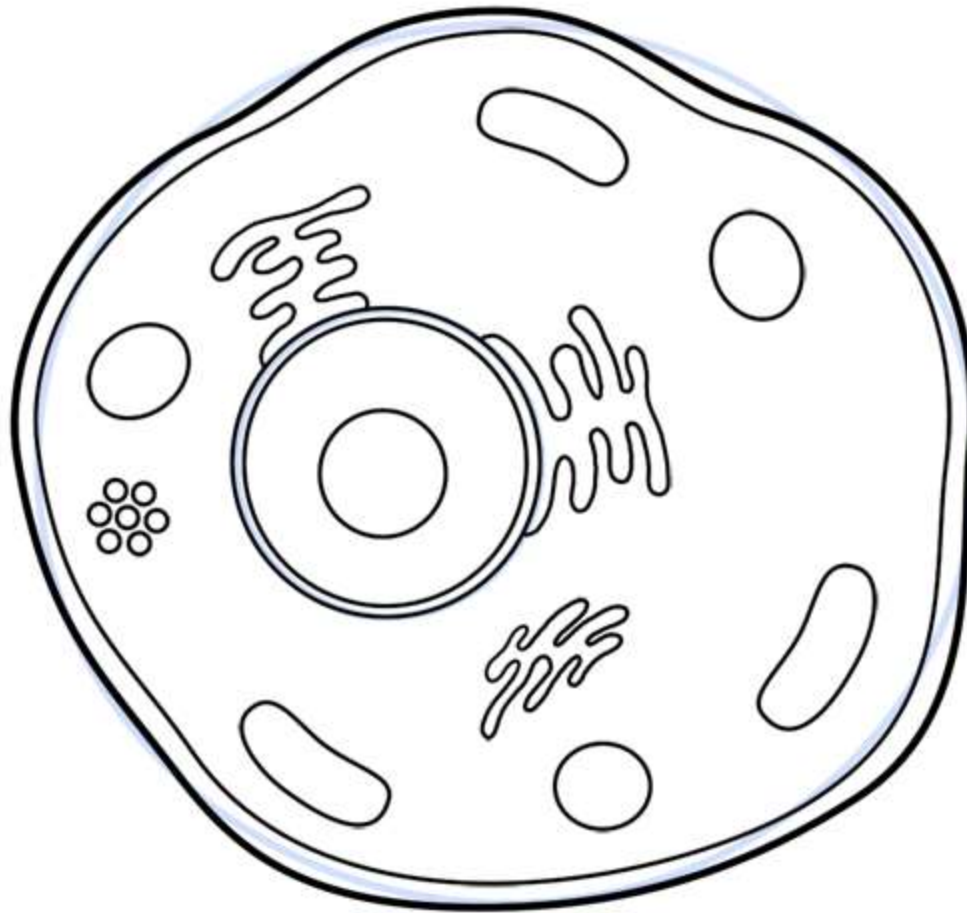


David Goodsell

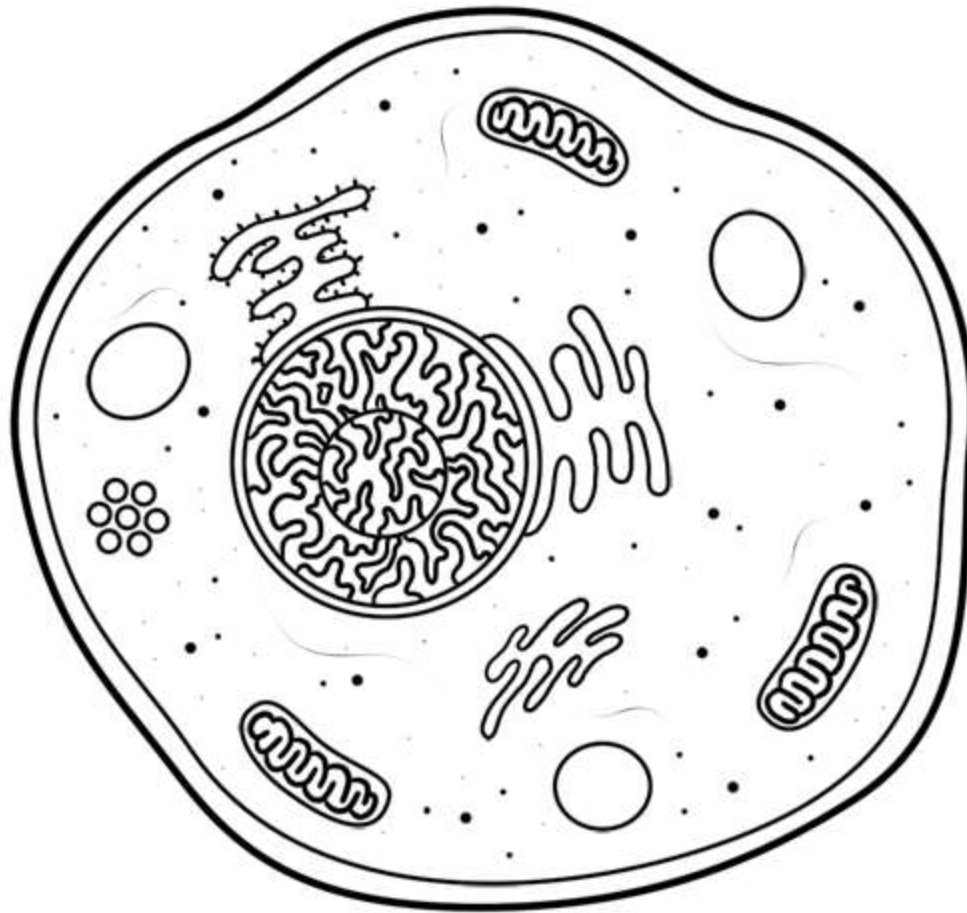
Scripps Research institute

*Scientist..., Author,... and
Artist of all things small.*

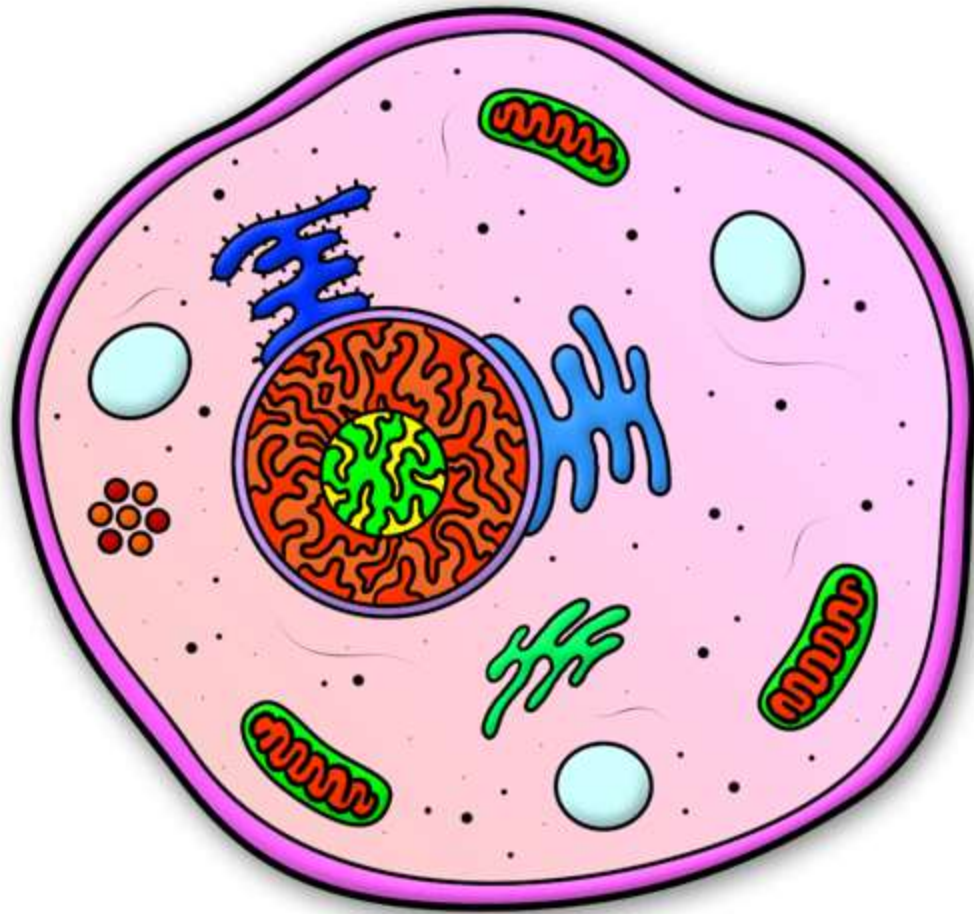




And finally... finish it off with lots of little details



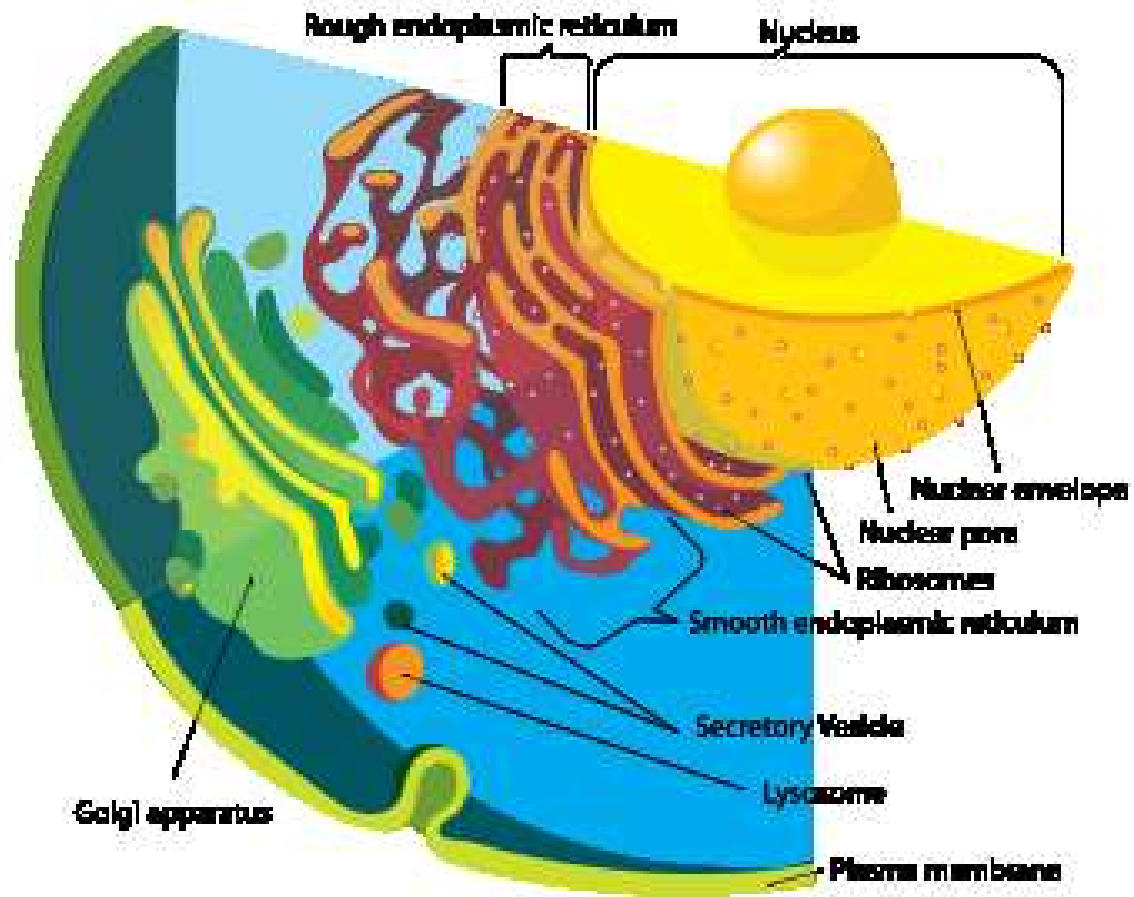
-thus completing the **cytoplasm**



And you're done!

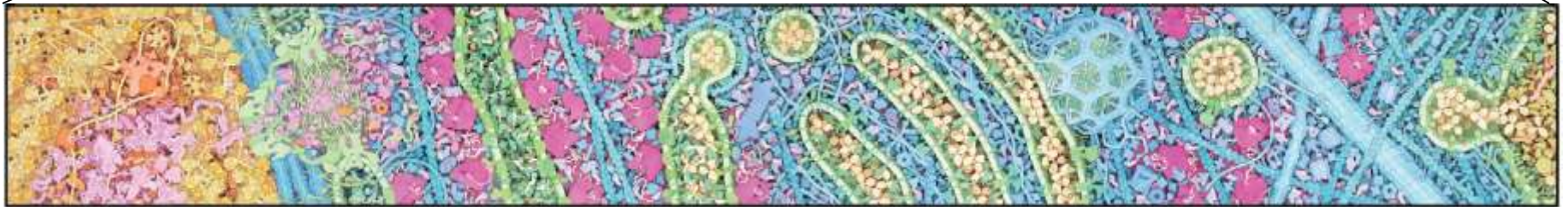
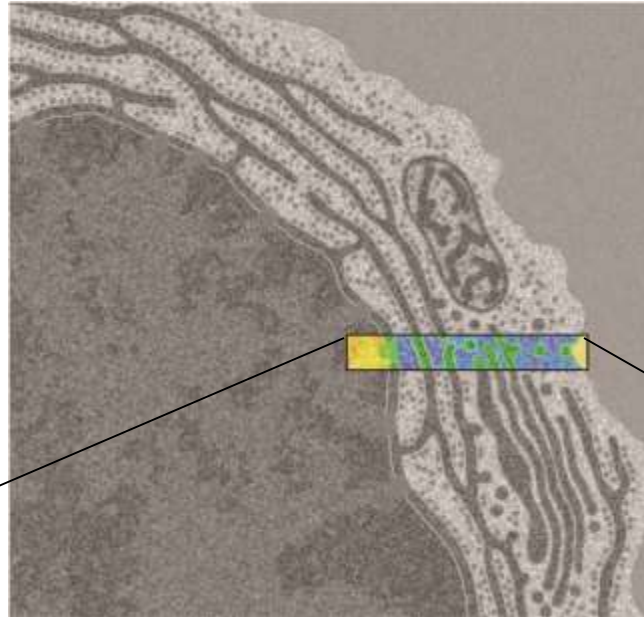


- | | |
|--------------------------------|-----------------|
| 1. Nucleolus | 7. Cytoskeleton |
| 2. Nucleus | 8. Smooth E.R. |
| 3. Ribosome | 9. Mitochondria |
| 4. Vesicle | 10. Vacuole |
| 5. Rough Endoplasmic reticulum | 11. Cytosol |
| 6. Golgi Apparatus | 12. Lysosome |



http://en.wikipedia.org/wiki/Animal_cell

An electron micrograph of an antibody-producing B-cell



Your recent flu shot,...in action.

Article

Miniseries: Illustrating the Machinery of Life

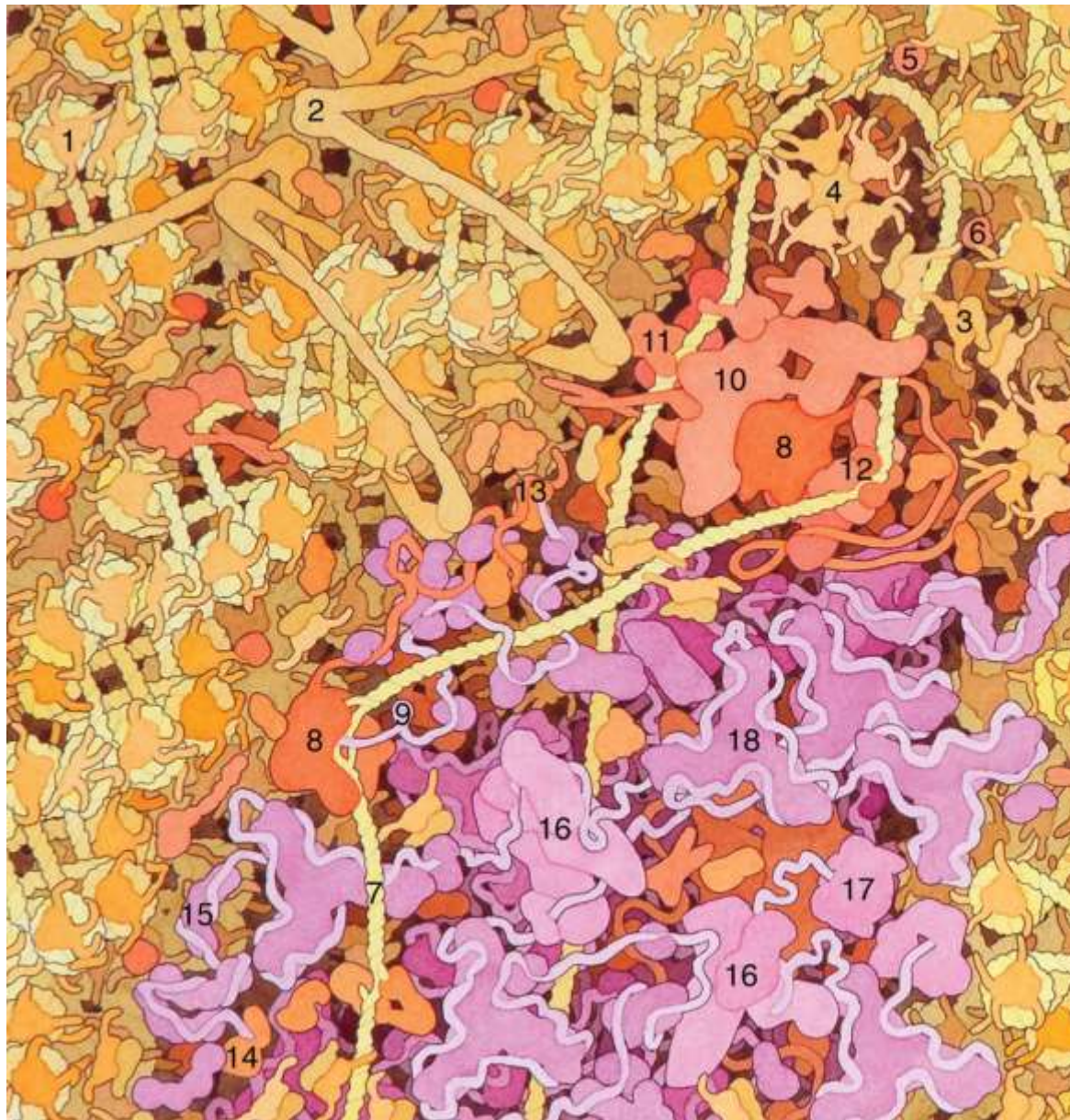
Eukaryotic Cell Panorama

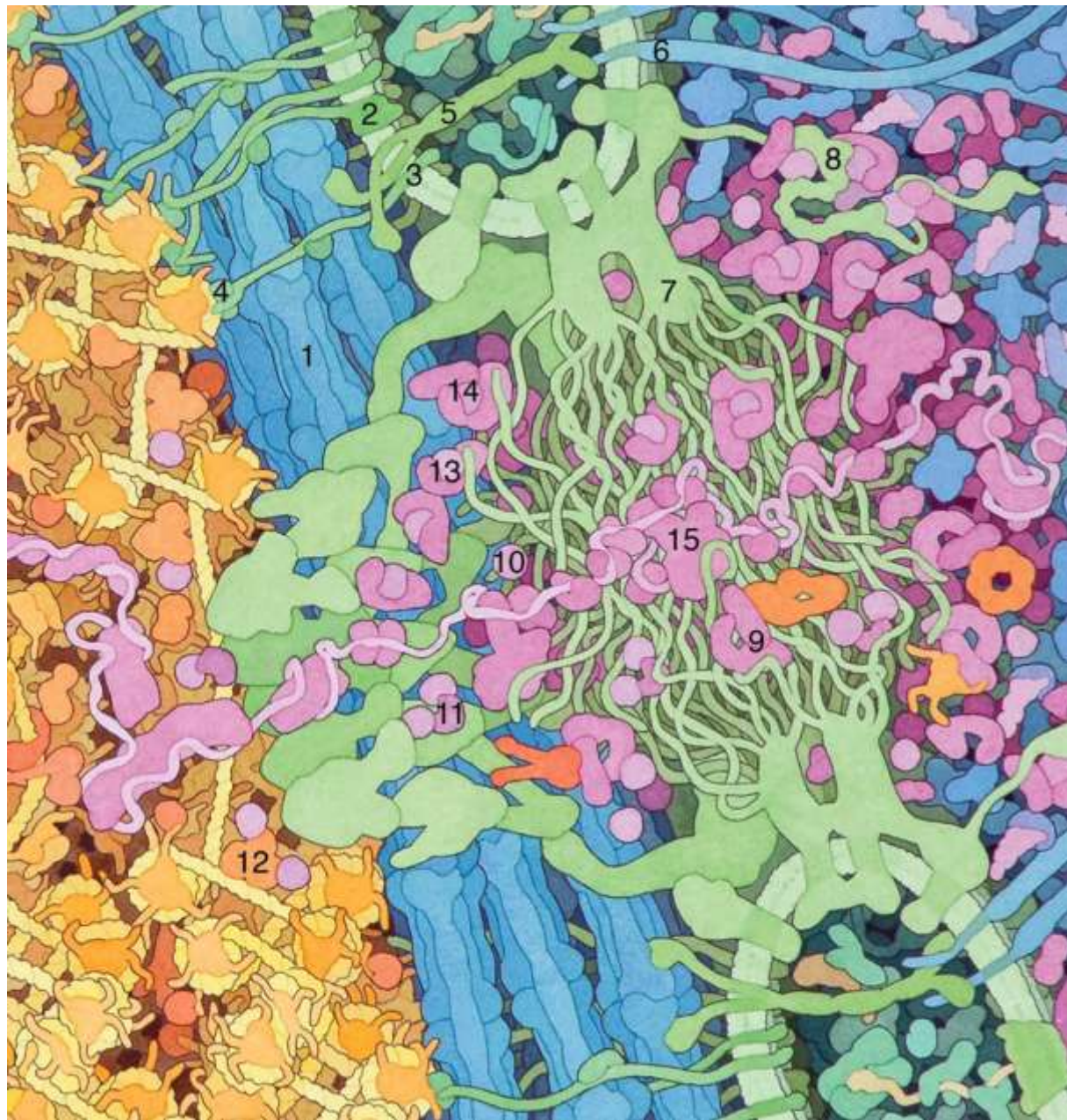
Received for publication, October 7, 2010, and in revised form, December 13, 2010

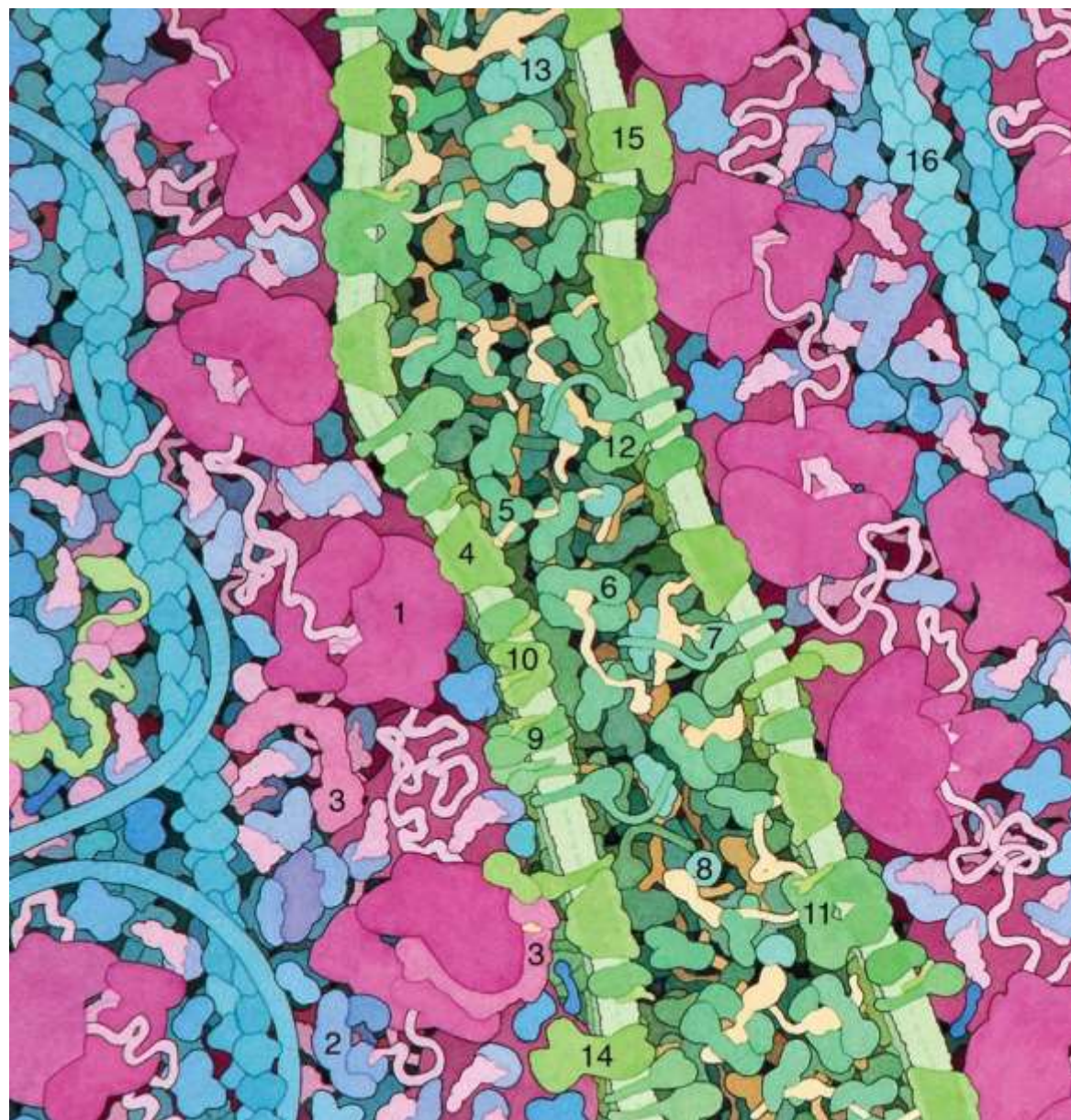
David S. Goodsell†

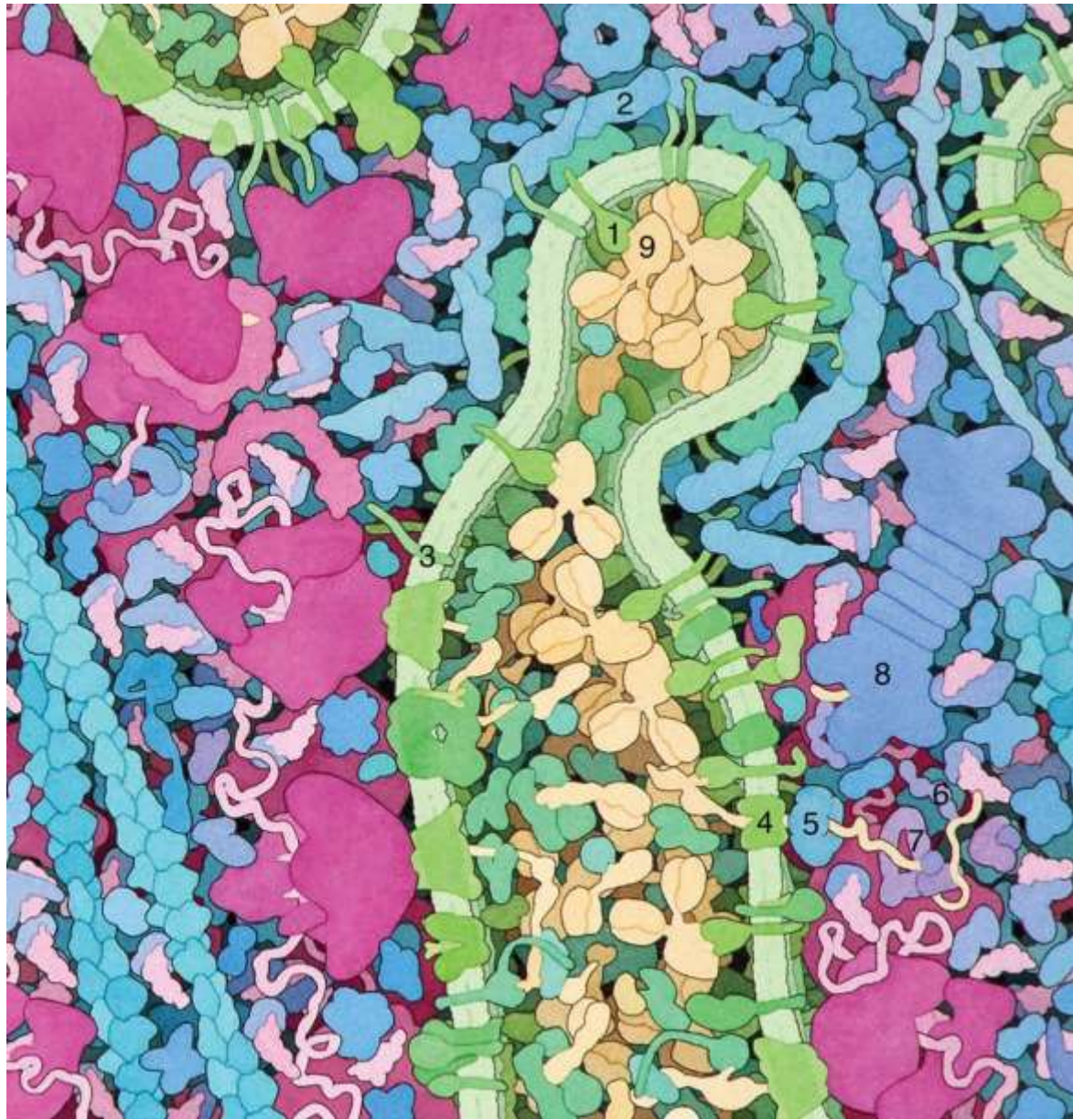
From the Department of Molecular Biology, The Scripps Research Institute, La Jolla, CA 92102

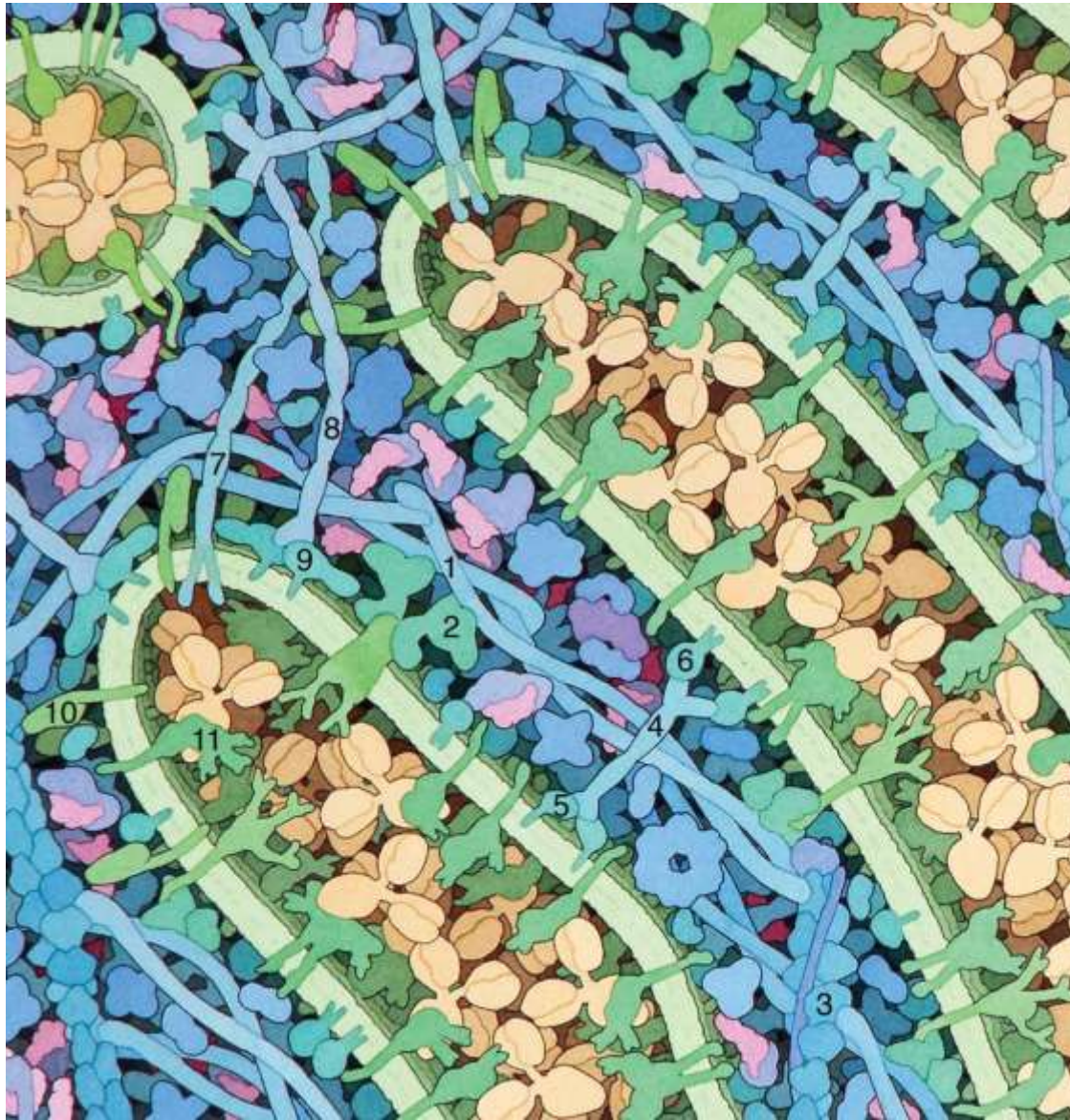
Diverse biological data may be used to create illustrations of molecules in their cellular context. This report describes the scientific results that support an illustration of a eukaryotic cell, enlarged by one million times to show the distribution and arrangement of macromolecules. The panoramic cross section includes eight panels that extend from the nucleus to the cell surface, showing the process of protein synthesis and export. Results from biochemistry, electron microscopy, NMR spectroscopy and x-ray crystallography were used to create the image.

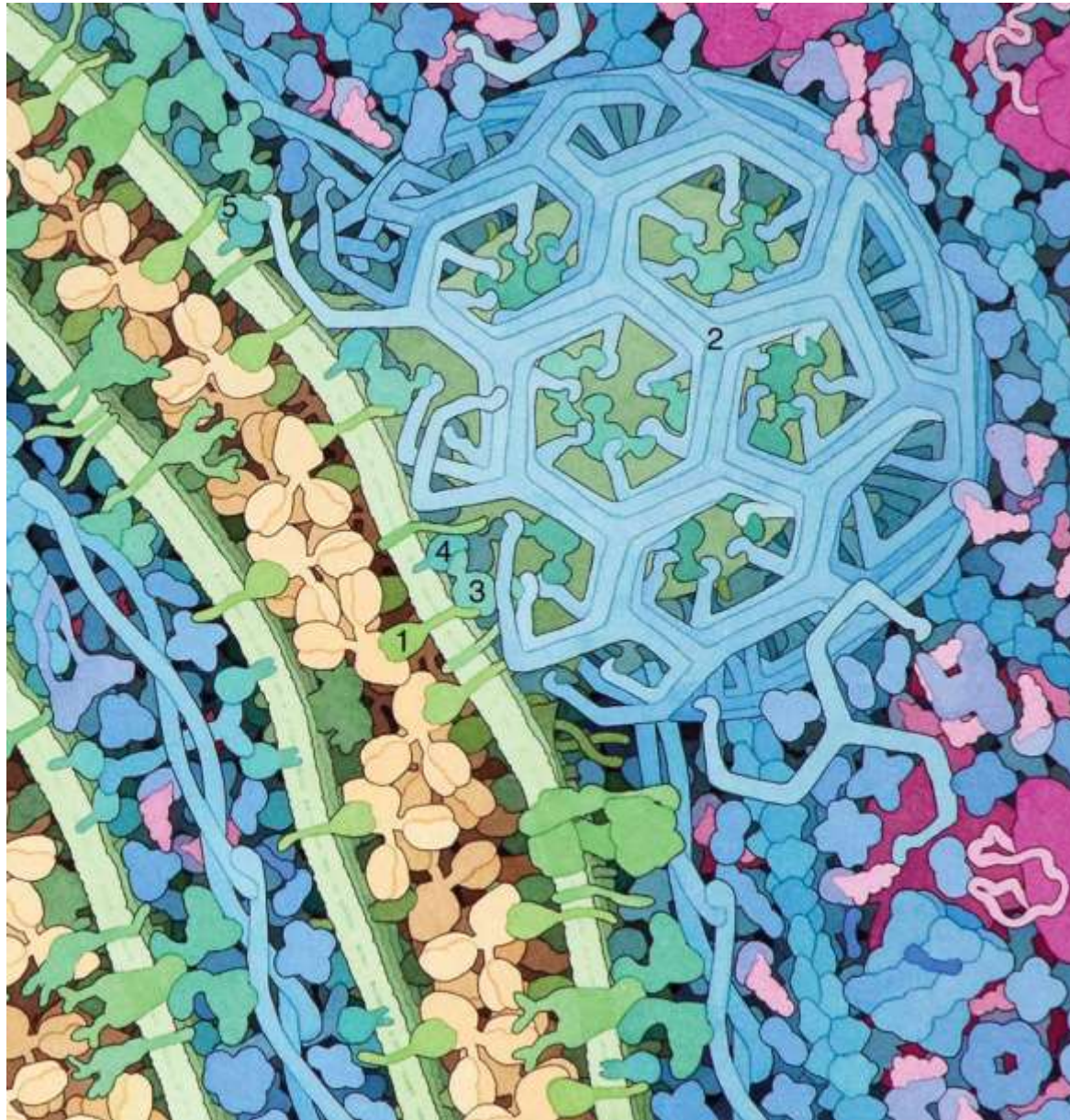


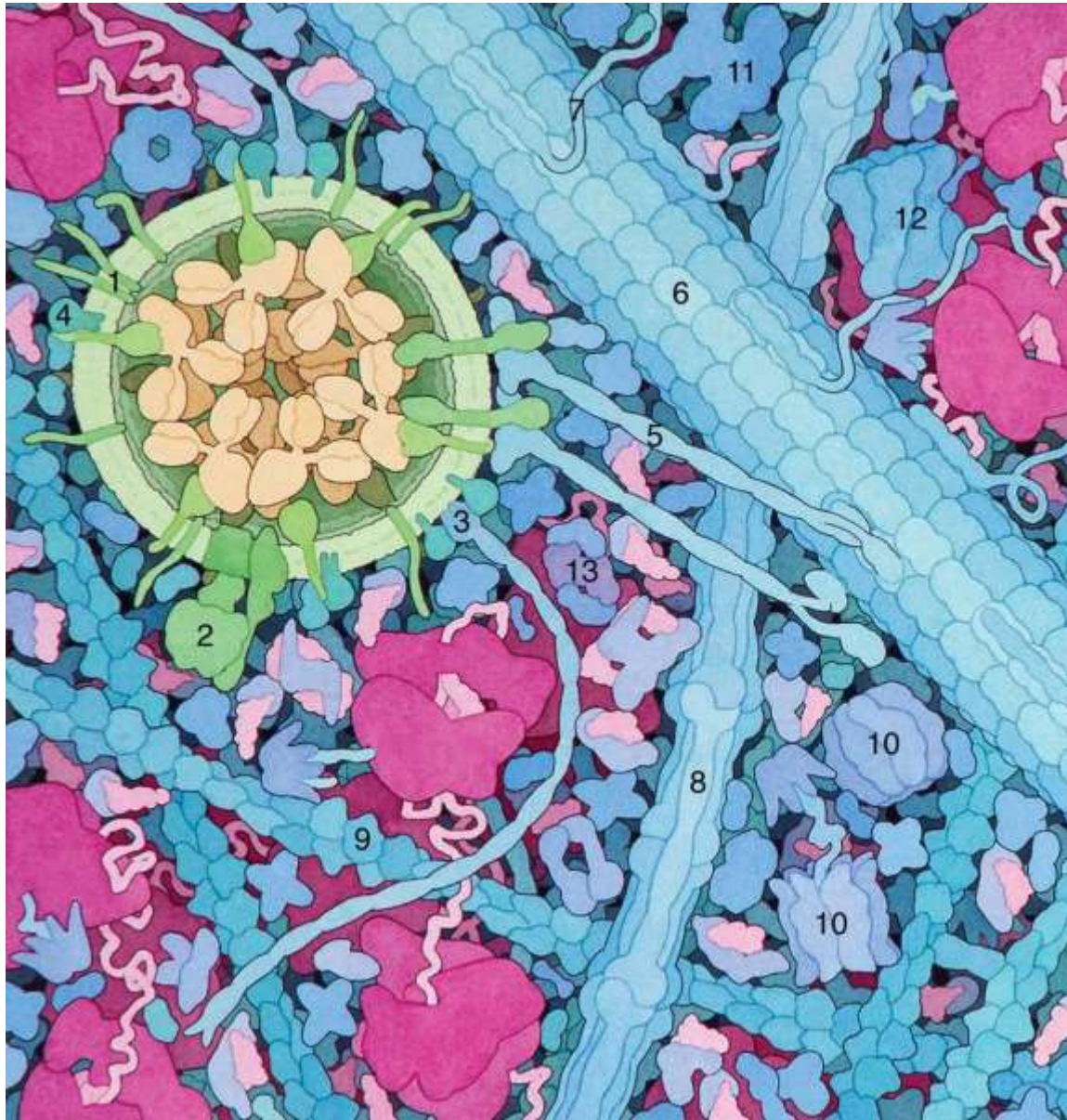






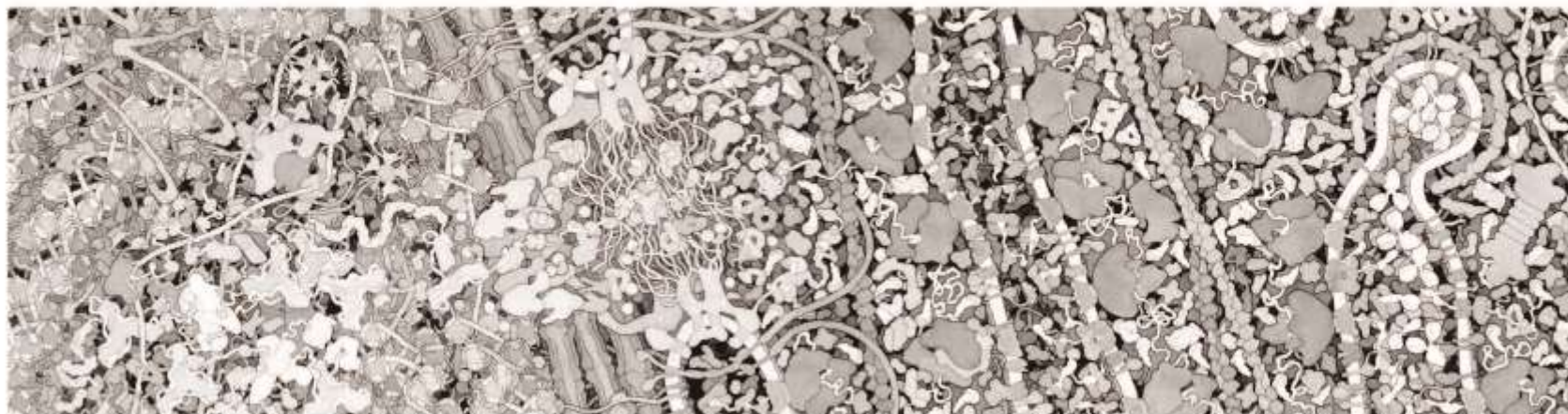








Tour of a Human Cell®



Find/Color/Label – a nucleosome
Find/Color/Label – the antibody gene

Find/Color/Label – an mRNA leaving the nucleus

Find/Color/Label – a ribosome, docked onto the E.R.

Find/Color/Label – a folded antibody protein



A Molecular Landscape by David Goodsell

3dmoleculardesigns.com/Education-Products/Tour-of-Human-Cell.htm

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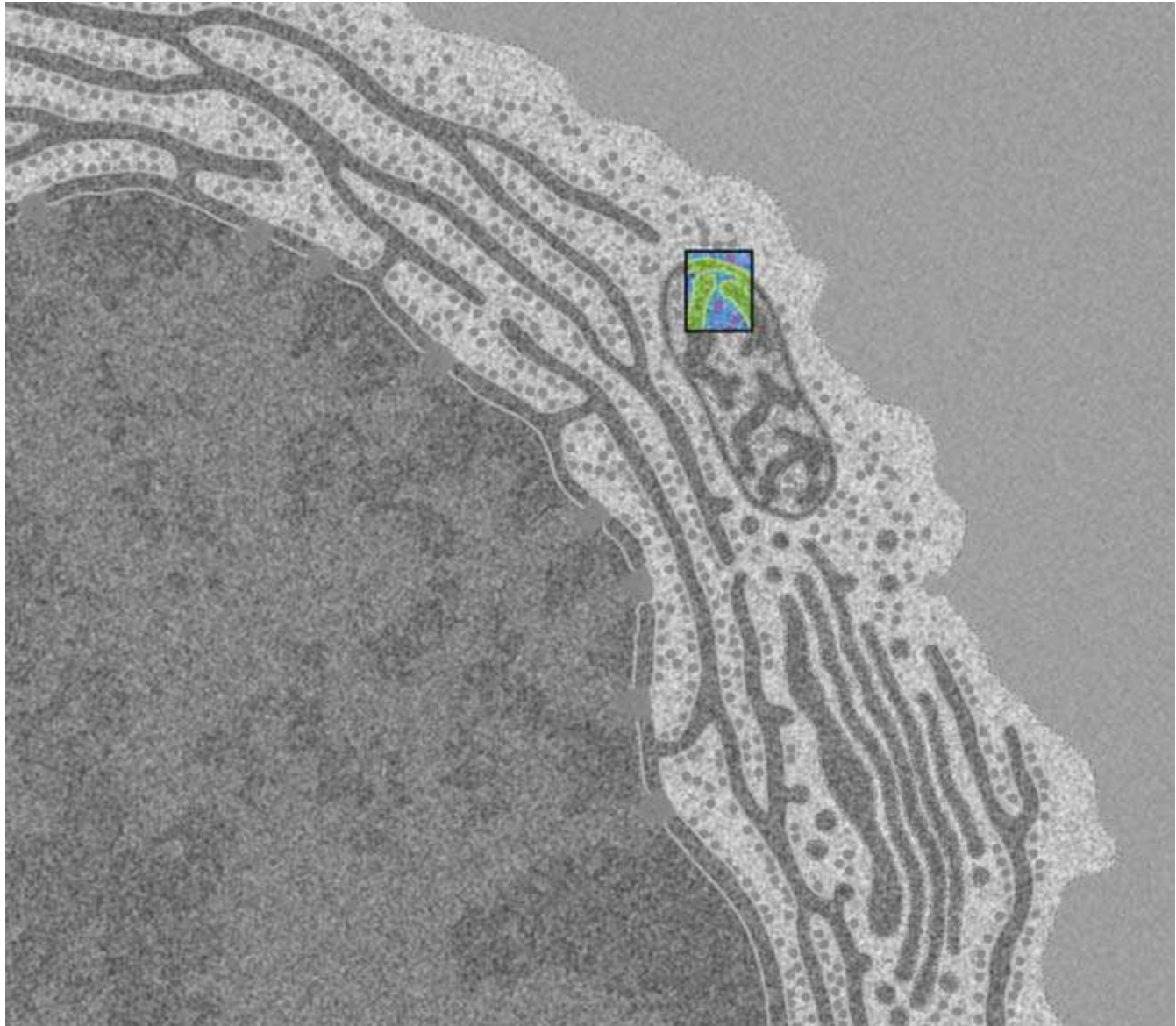


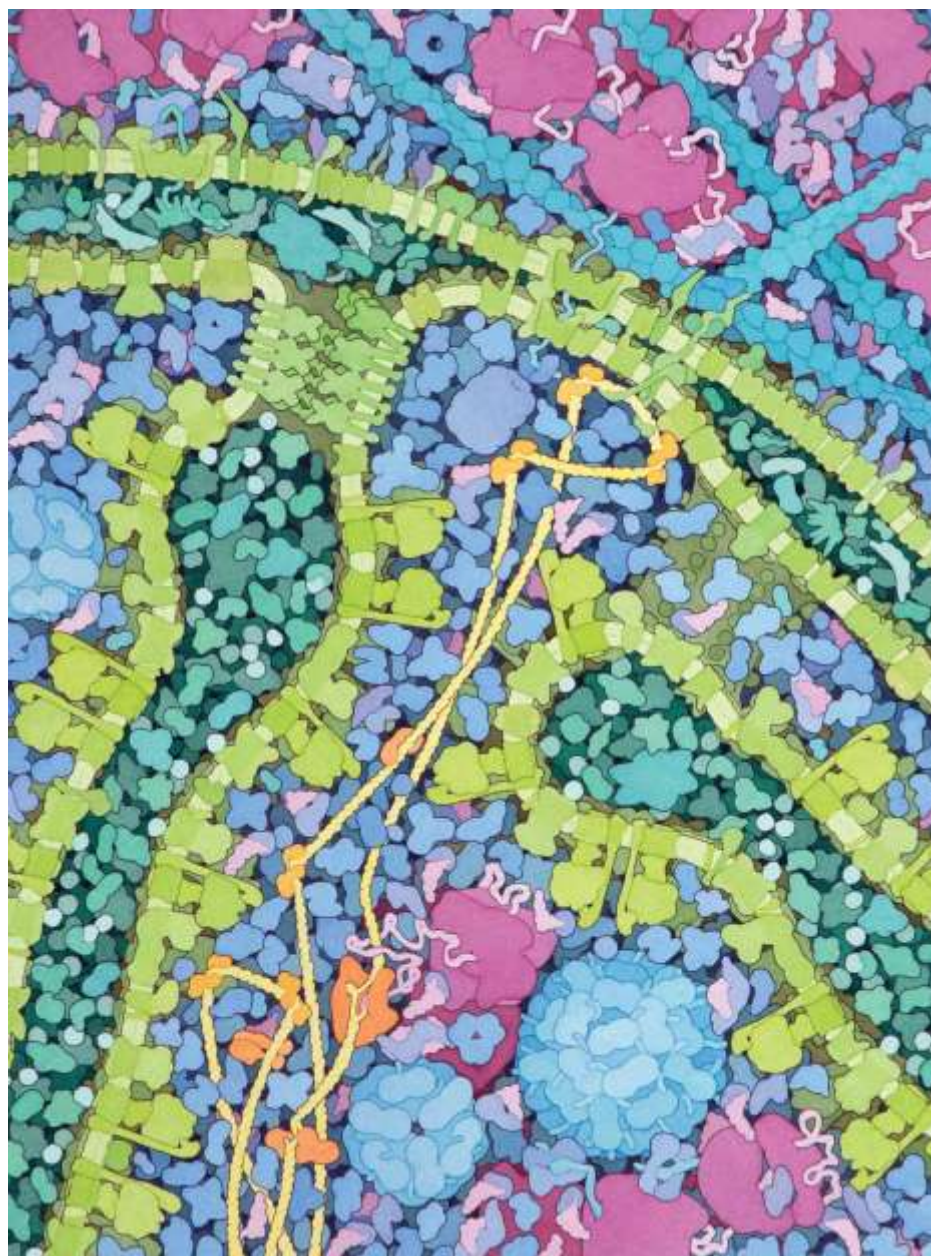
Find/Color/Label – the Golgi Apparatus

Find/Color/Label – a clathrin cage, forming an endosome

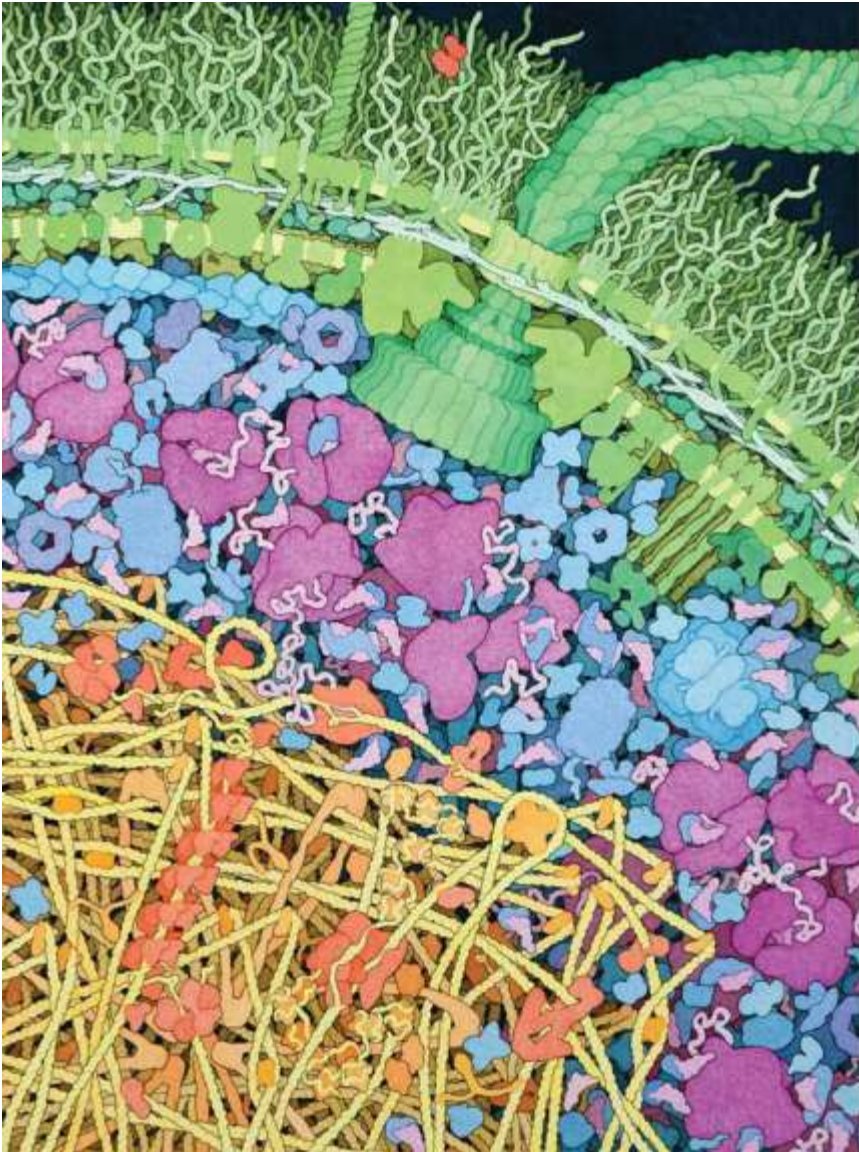
Find/Color/Label – kinesin motor proteins

Find/Color/Label – antibodies released into the circulation

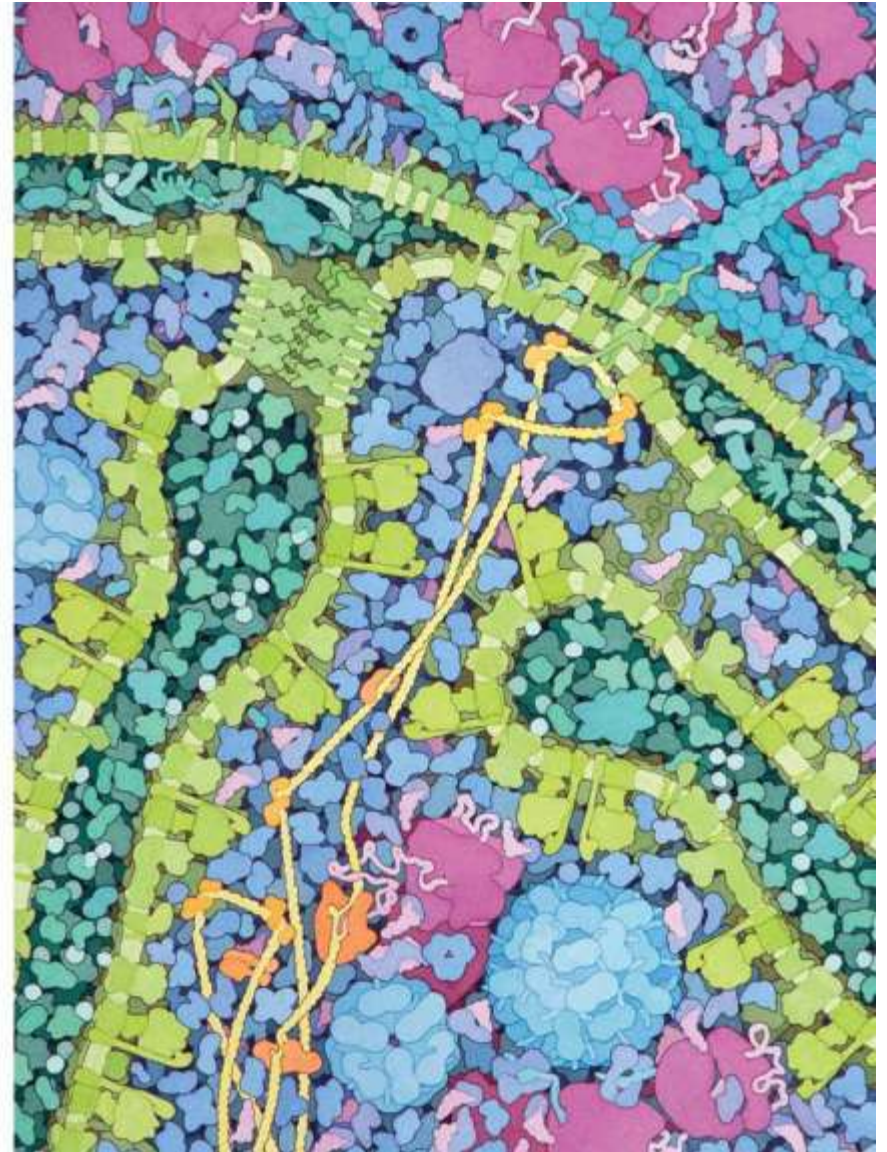


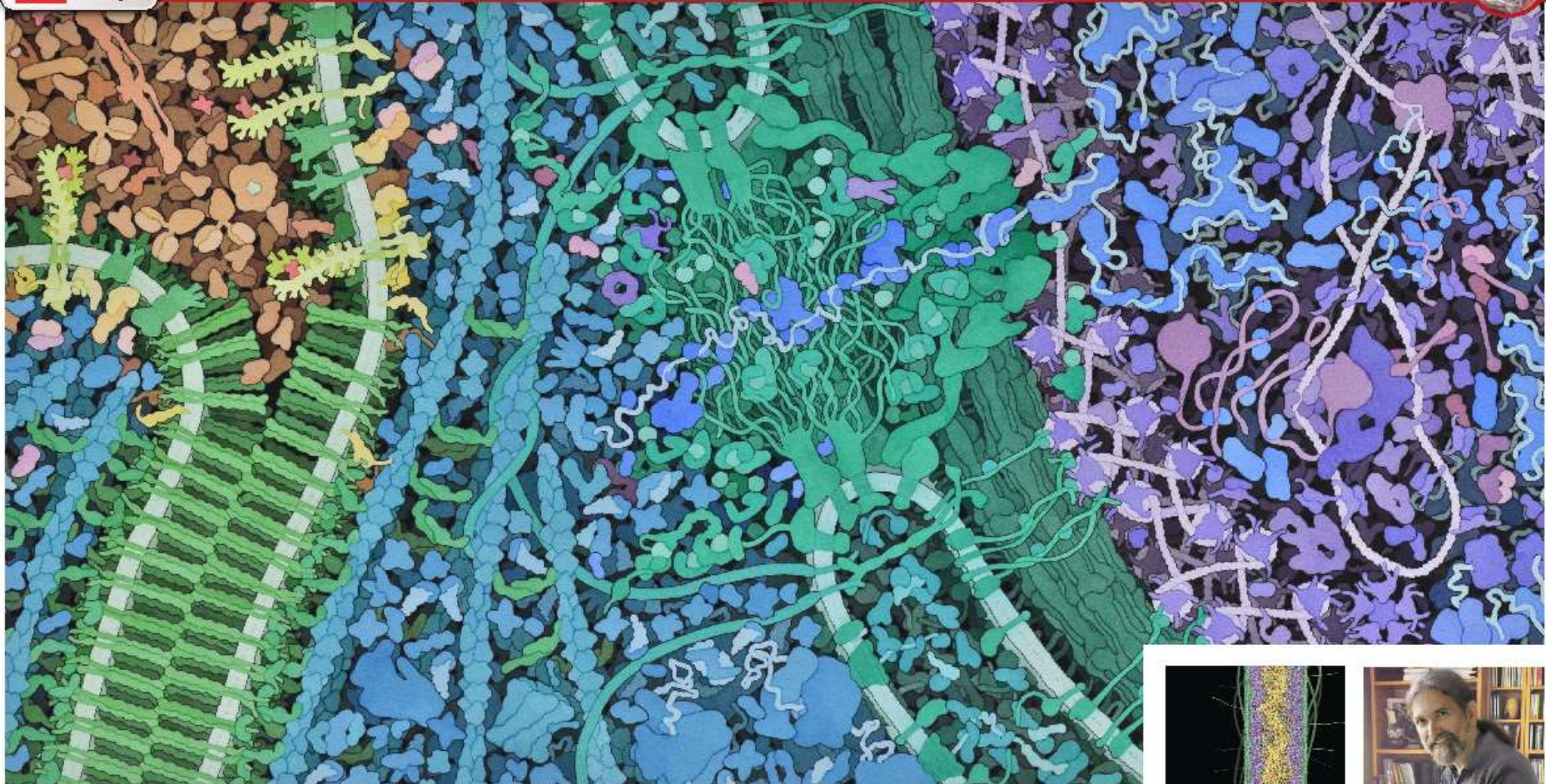


E. coli



Mitochondrion





Angiogenesis is the formation of new blood vessels from existing vessels. This is an essential process during development and wound healing. However the initiation of angiogenesis is also the key event in the transition of a tumor to the malignant state and is a limiting factor in tumor growth, making it a promising target for new cancer therapies.

Dr. Elise Span, then an undergraduate student in the laboratory of Dr. Daniel Sem, collaborated with biologist/artist Dr. David S. Goodsell to create this cellular landscape that illustrates a key intercellular and molecular process in angiogenesis: vascular endothelial cell growth factor (VEGF) signal transduction. Elise identified the relevant proteins in the pathway and researched their physical properties and interactions by reviewing the primary literature from which David was able to create this scale depiction of an intricately complex molecular process.

E. Span, et al, *Biochemistry and Molecular Biology Education* 41:213-23 (2013)

