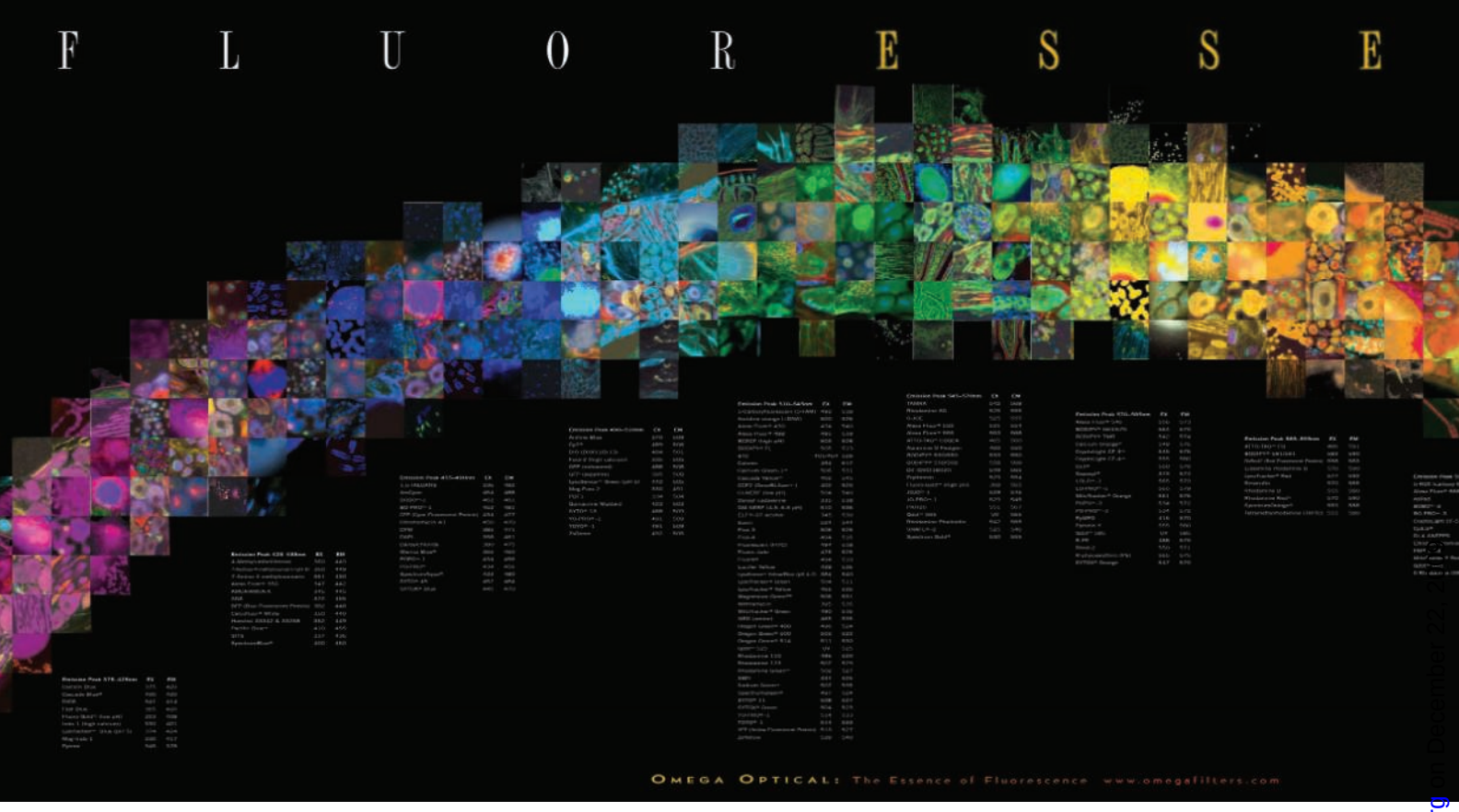

The Synapse Revealed

Graham Johnson, Graham Johnson Medical Media

Deep inside the brain, a neuron prepares to transmit a signal to its target. To capture that expectant, fleeting moment with painstaking detail, science illustrator Graham Johnson based his elegant, highly accurate drawing on ultrathin micrographs of sequential brain slices.

The brain contains billions of neurons, whose network of chemical messages form the basis for all thought, movement, and behavior. Johnson's illustration tells the story of one such signal, a synaptic millisecond that is both eye-catching and accurate in scale and shape. Using the brain slices as references, Johnson sketched the layout of the illustration in pencil, from the convoluted labyrinth of neurons in the background to the clusters of organelles inside the neural cells. After scanning the drawing into three-dimensional modeling software, he colored the image with a palette of dreamy, underwater colors and added the bumpy, realistic texture and glowing lighting reminiscent of a scanning electron micrograph—qualities that help outline the image, pull the central neural interaction forward, and give it a stronger impact, he says.

ILLUSTRATION
First Place

The resulting image is a careful balance between precision and beauty. Because the original data were so complex, Johnson cut the number of neuron interactions depicted to only 30% of the original data—"otherwise, it's just a mass of spaghetti in front of you," he says.

"It gives us the information we need, but at the same time brings an aesthetic, a refinement," says panel of judges member Felice Frankel. "That's really important: to get the viewer to want to look—and then to ask questions."

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