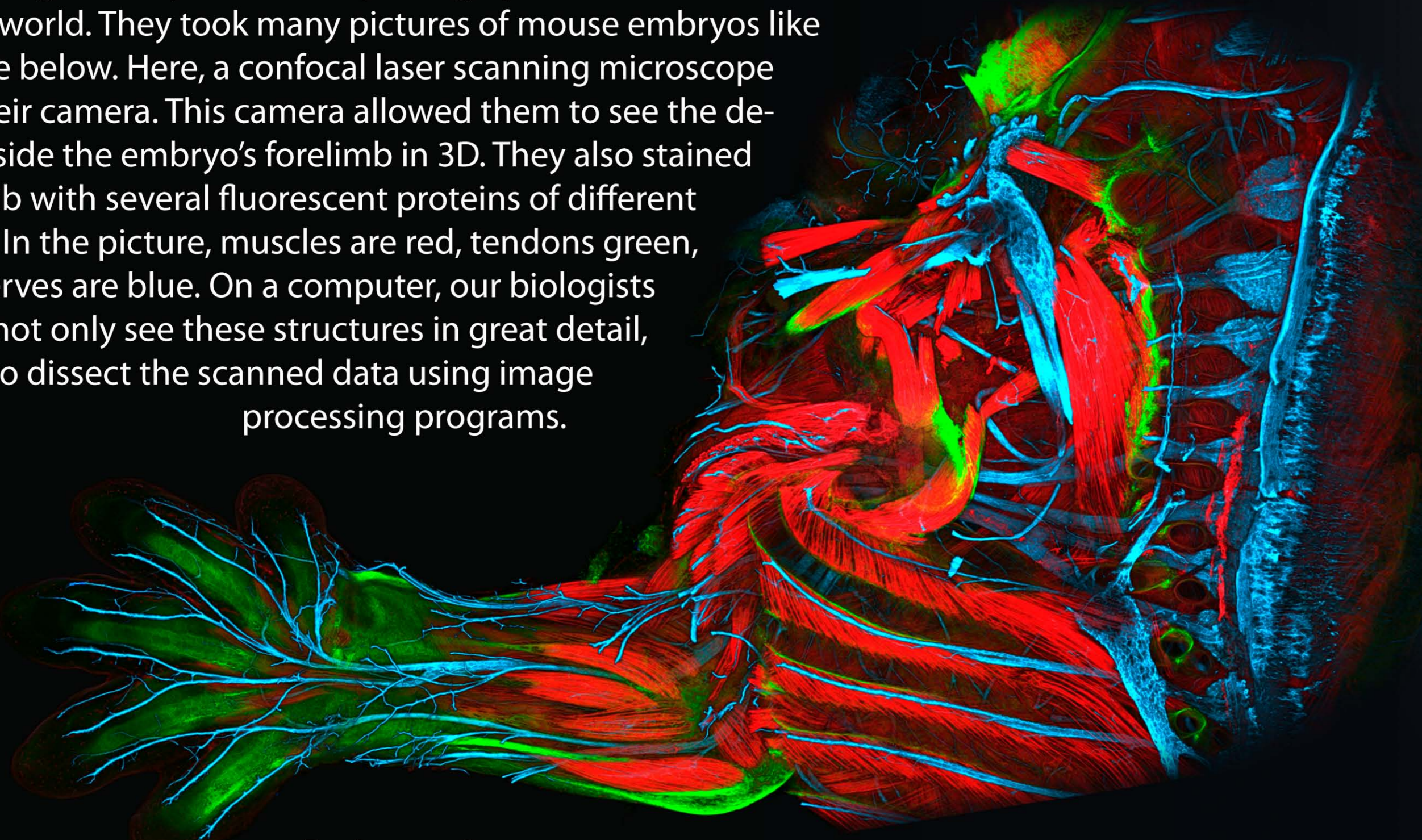


A STORY OF REANIMATING AN EMBRYONIC MOUSE LIMB

Many biologists work with mice, but they never had a vivid representation of a mouse embryo's inner workings. One day, a group of biologists decided to make detailed models of embryonic mouse limbs, so that other biologists could use them as references in their experiments. They talked their ideas to an artist working with mice too, but those of computers. The artist was glad that he could work with scientists and perhaps learn a little of the unseen world. So, they discussed, experimented, studied, and worked, sometimes together and sometimes separately. Here is the story of their journey through embryonic anatomy.

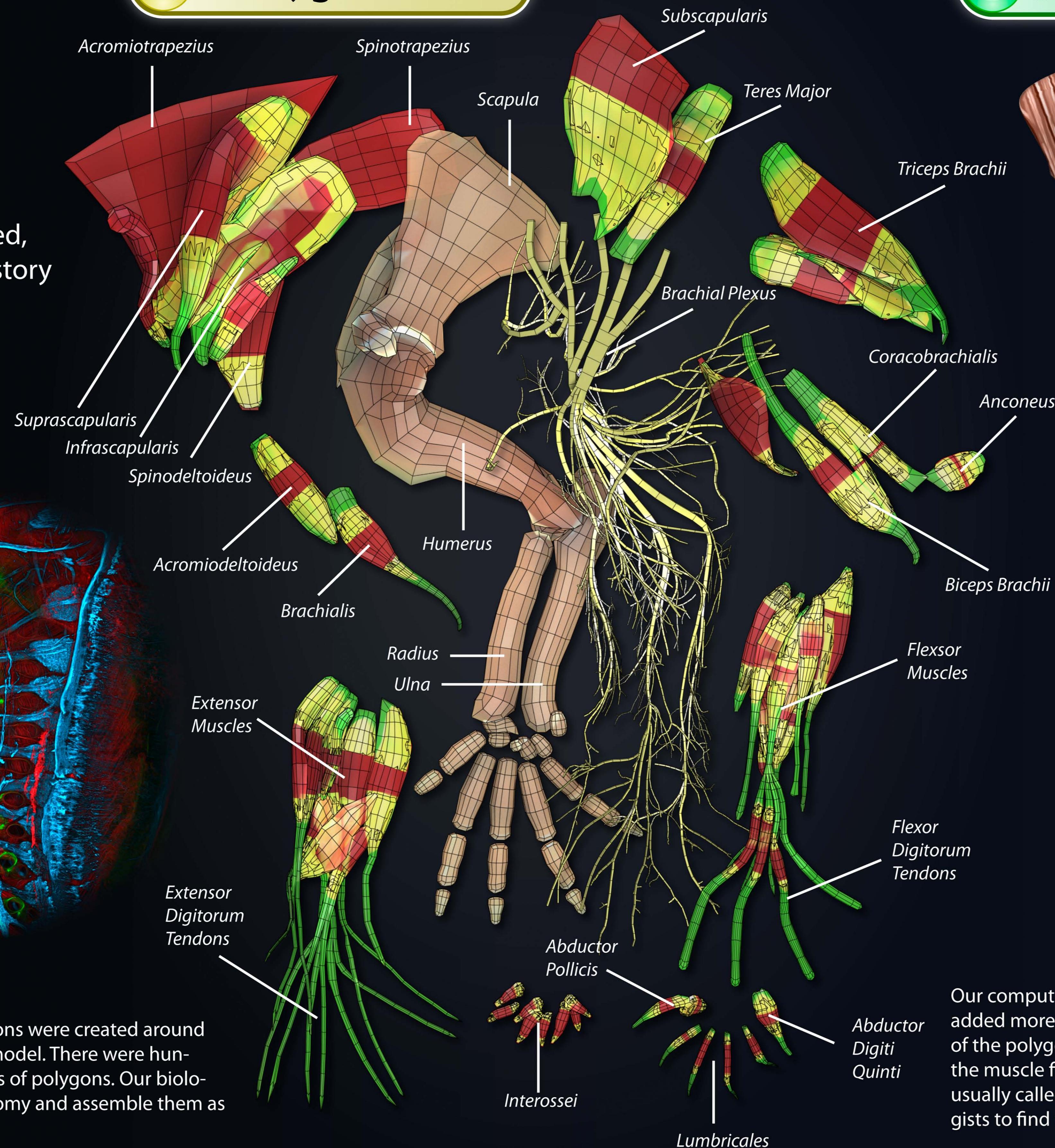
1 3D Photography of Mouse Embryos

Our biologists are professional photographers of the microscopic world. They took many pictures of mouse embryos like the one below. Here, a confocal laser scanning microscope was their camera. This camera allowed them to see the details inside the embryo's forelimb in 3D. They also stained the limb with several fluorescent proteins of different colors. In the picture, muscles are red, tendons green, and nerves are blue. On a computer, our biologists could not only see these structures in great detail, but also dissect the scanned data using image processing programs.

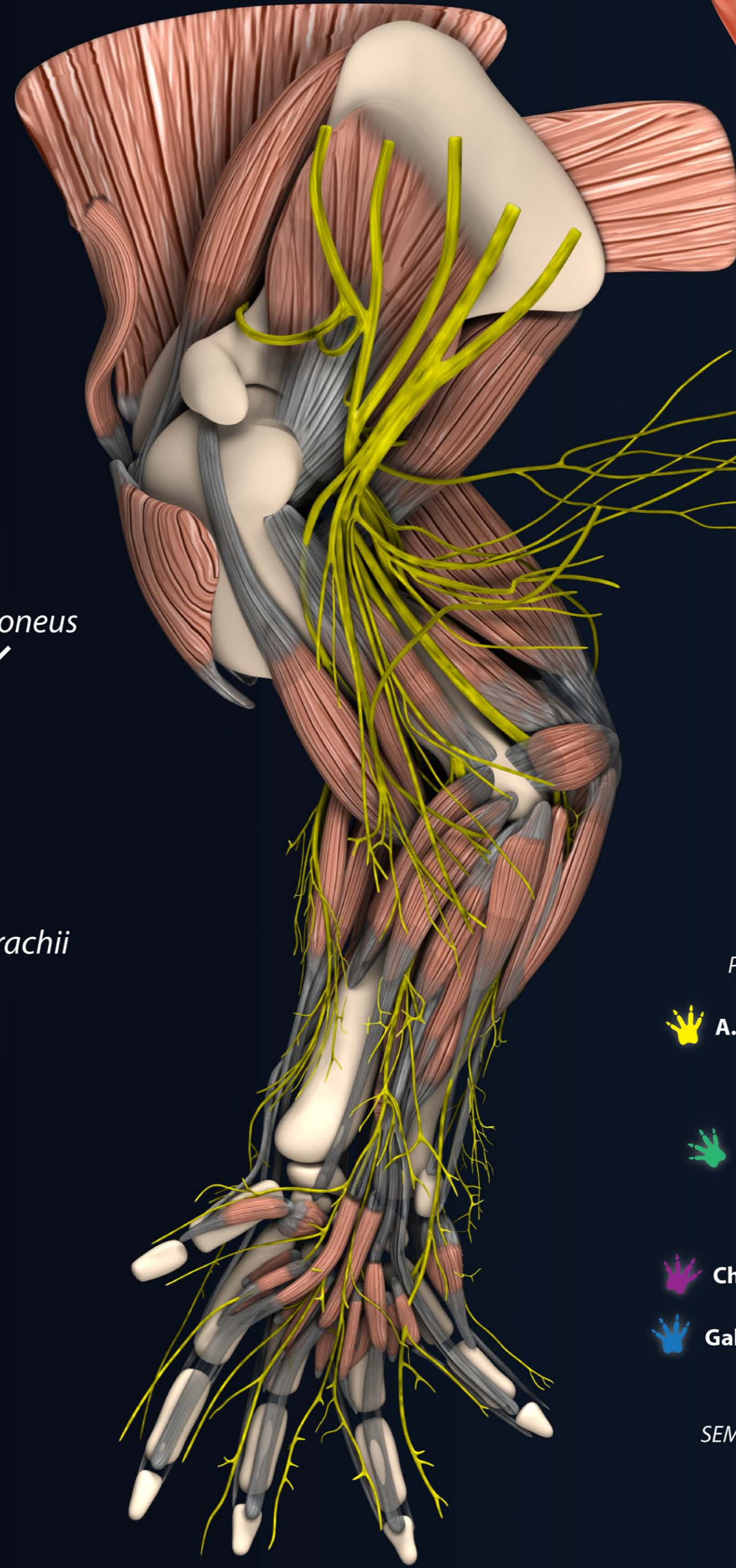


Each muscle, tendon, bone and nerve was dissected from the 3D data. With the help of our computer artist, polygons were created around the dissected pieces. Then each structure became a polygon model. There were hundreds of these models. Each model was composed of hundreds of polygons. Our biologists had to identify each model with their knowledge in anatomy and assemble them as if they were solving a 3D jigsaw puzzle.

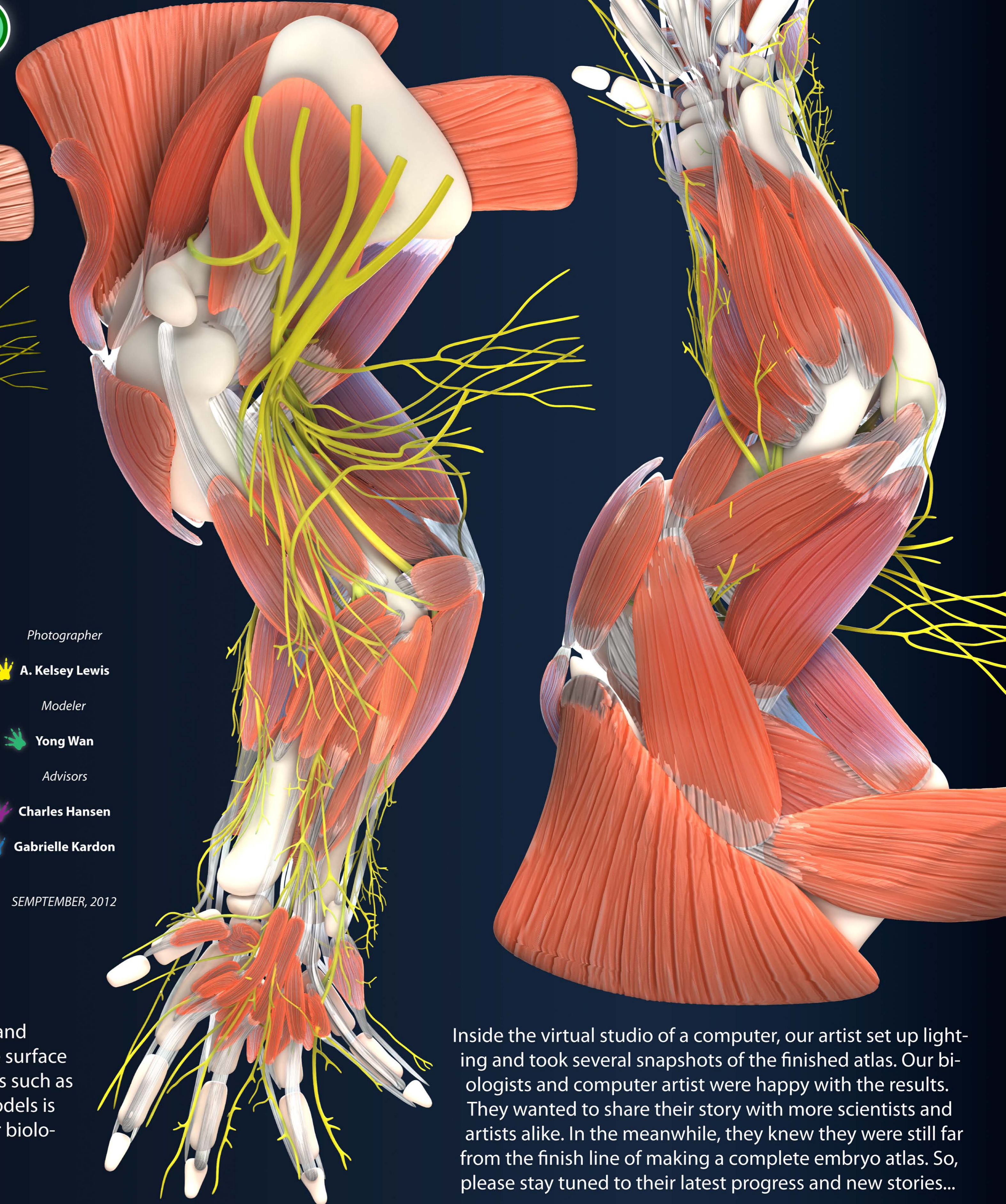
2 A 3D Jigsaw Puzzle



3 Dress Up and Makeup



4 Let There Be Light



Photographer
A. Kelsey Lewis
Modeler
Yong Wan
Advisors
Charles Hansen
Gabrielle Kardon
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Our computer artist smoothed the polygon models and added more details. Then he painted patterns on the surface of the polygon models. Now we could see fine details such as the muscle fibers. The complete set of assembled models is usually called an anatomical atlas, since it's a map for biologists to find their ways in anatomy.

Inside the virtual studio of a computer, our artist set up lighting and took several snapshots of the finished atlas. Our biologists and computer artist were happy with the results. They wanted to share their story with more scientists and artists alike. In the meanwhile, they knew they were still far from the finish line of making a complete embryo atlas. So, please stay tuned to their latest progress and new stories...