

Supplementary Material (ESI) for Analyst manuscript: Biomedical Tissue Phantoms with Controlled Geometric and Optical Properties for Raman Spectroscopy and Tomography

Viewing Instructions

This document contains 3D pdf figures of the medical CAD derived models of a human arm and rat leg. The 3D figures can be viewed in Adobe Acrobat reader, and the 3D models can be directly manipulated by the reader. The 3D toolbar is shown below, with different features labeled by numbers.



When the pdf is first opened, the 3D figures are not immediately opened. To open the model, click on the placeholder image. For optimum viewing, select the "Shaded Illustration" view from the View tool (4). To rotate, translate or zoom the view, use the motion tools (1). The 3D Measurement Tool (2) can be used to directly measure the distance between points on the model. The measurement units are millimeters for the all models presented here.

The Model Tree tool (3) allows individual layers to be enabled or disabled in the view. This allows measurements directly on the bone layer. The cross-section tool (5) allows a cutplane view through the model. This also allows the distance between the skin and bone to be measured.



Fig. 1 3D model of human wrist. The outer surface of the cortical bone is shown as an opaque white surface, and the surface of the skin is shown by a semi-transparent beige surface. The model units are millimeters.

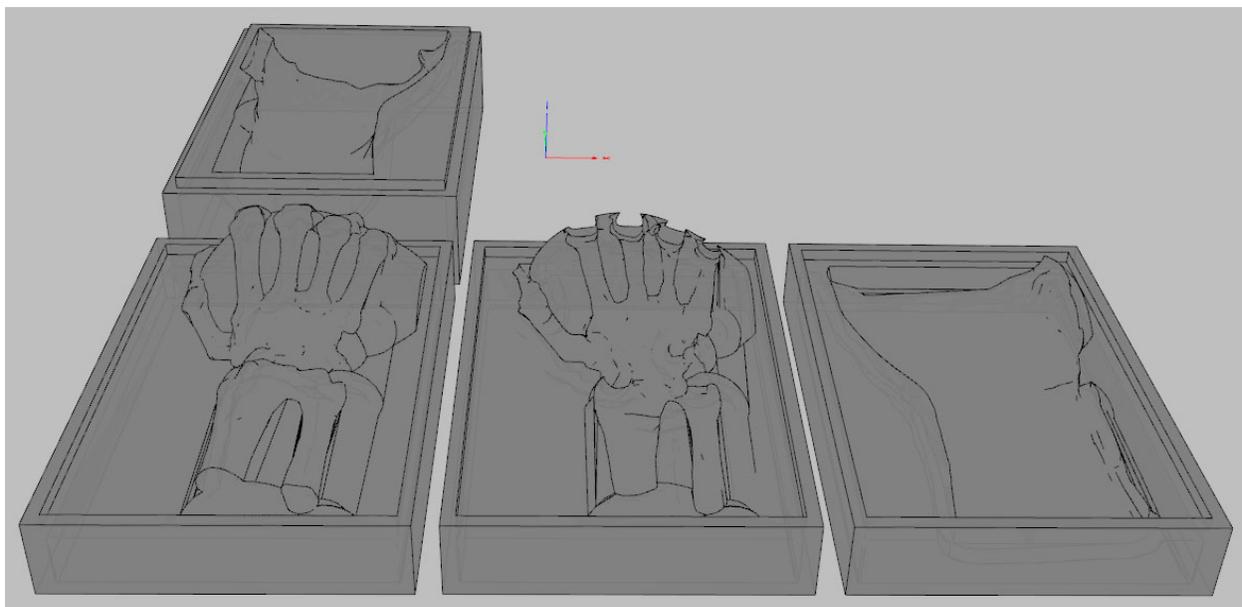


Fig. 2 3D model of molds used for casting the human wrist phantom. The model units are millimeters.

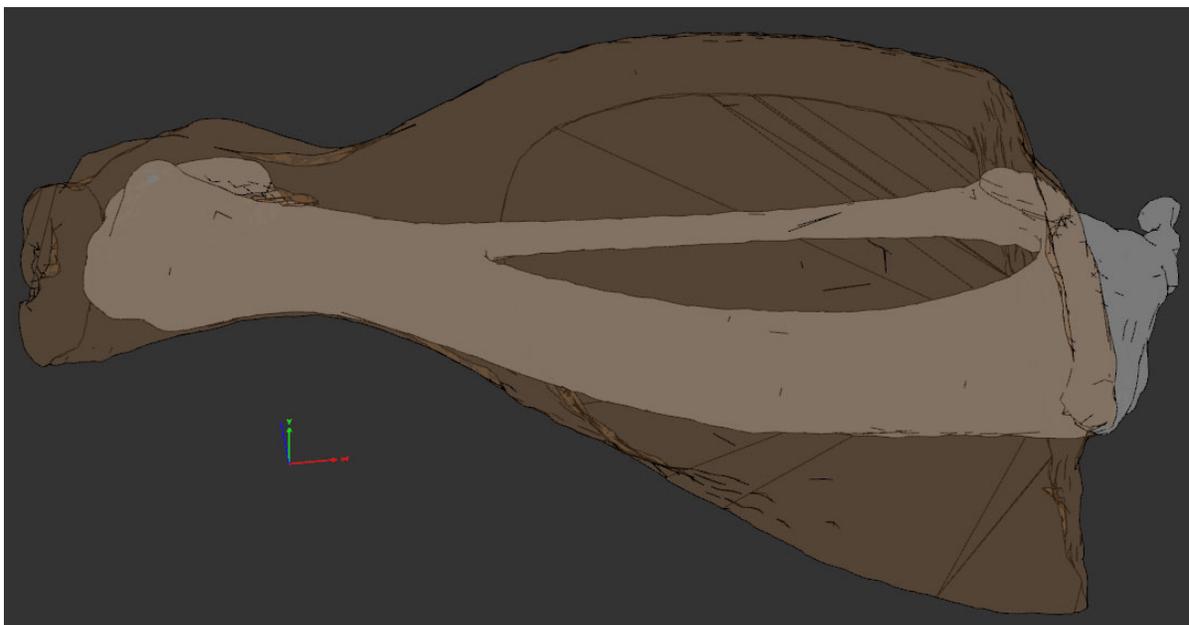


Fig. 3 3D model of rat leg. The outer surface of the cortical bone is shown as an opaque white surface, and the surface of the skin is shown by a semi-transparent beige surface. The model units are millimeters.

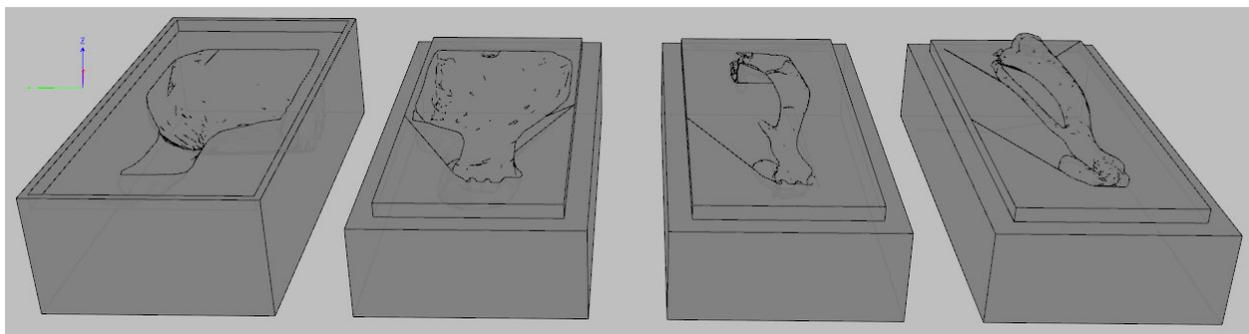


Fig. 4 3D model of molds for rat leg. The model units are millimeters.

The above 3D figures were first converted into U3D files and then inserted into the Microsoft Word generated PDF file using the 3D tools feature in Adobe Acrobat Pro 9. A custom Matlab program was written for converting the 3d triangle surface model files (STL) into universal 3D files (U3D) for incorporating models into 3D pdf files. The Matlab program is freely available at <http://www.mathworks.com/matlabcentral/fileexchange/31413>.

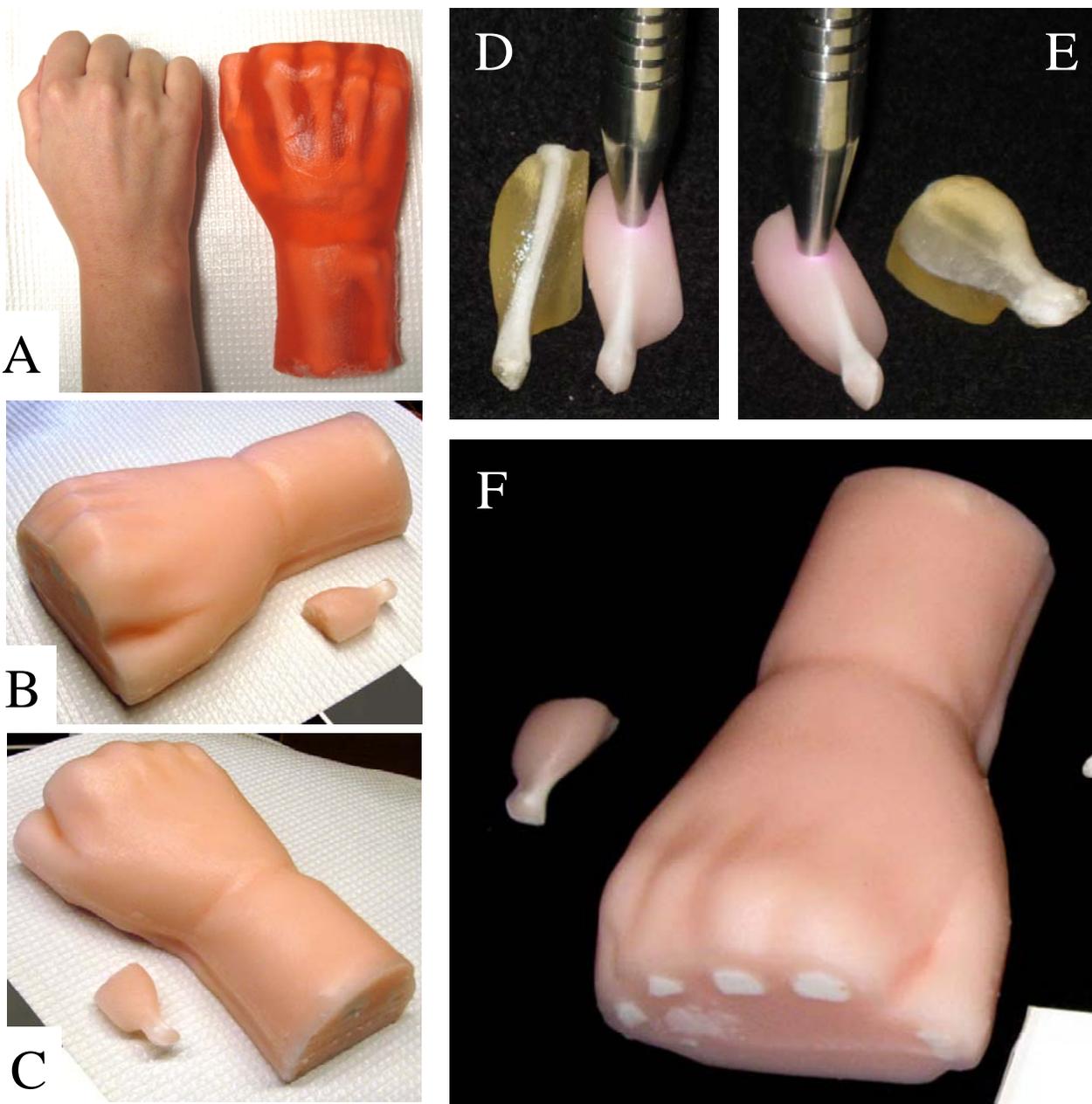


Fig. 5 Photographs of additional tissue phantoms of human wrist and rat leg. In A, a human arm is compared to a wrist phantom with no scattering added into the outer layer. In B, C and F, tissue phantoms of a human wrist and rat leg are shown from different perspectives. In D and E, tissue phantoms of a rat leg with and without scattering in the soft tissue layer allow comparison of the internal structures.