Case Study: Hypsibius exemplaris (Water Bear)

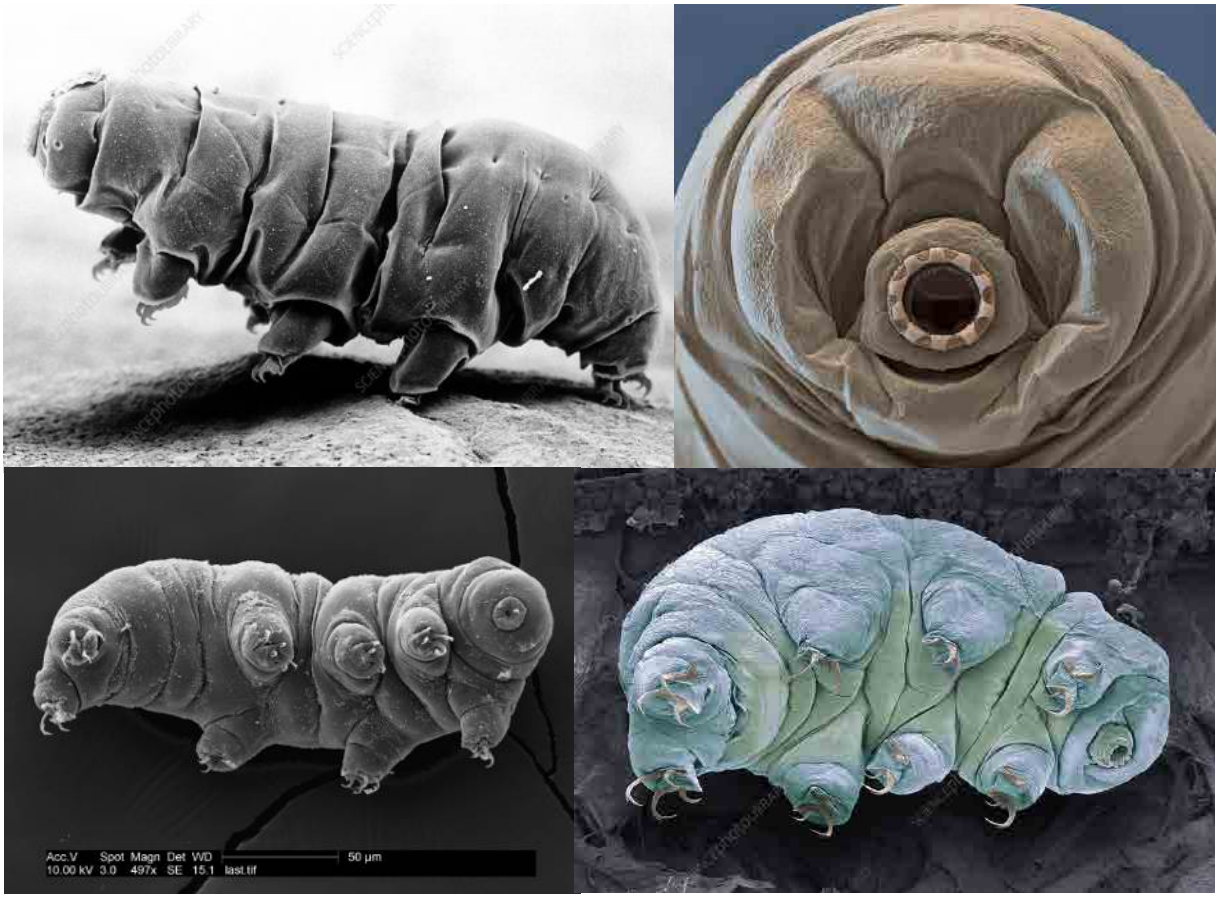
This example demonstrates a typical professional workflow used to create a production-ready PBR 3D model. The workflow is designed to produce assets that transfer efficiently between Autodesk 3ds Max, Maya, Blender and other modern 3D applications.

1. Research

Research the subject in question. Video reference is particularly valuable for studying movement, deformation and anatomy from multiple angles.

2. Collecting reference images.

As high-quality microscopic reference is limited, I gather material from multiple scientific sources and viewing angles, selecting only images that appear to represent the same species. Artistic interpretations and AI-generated imagery are deliberately excluded from the reference set.

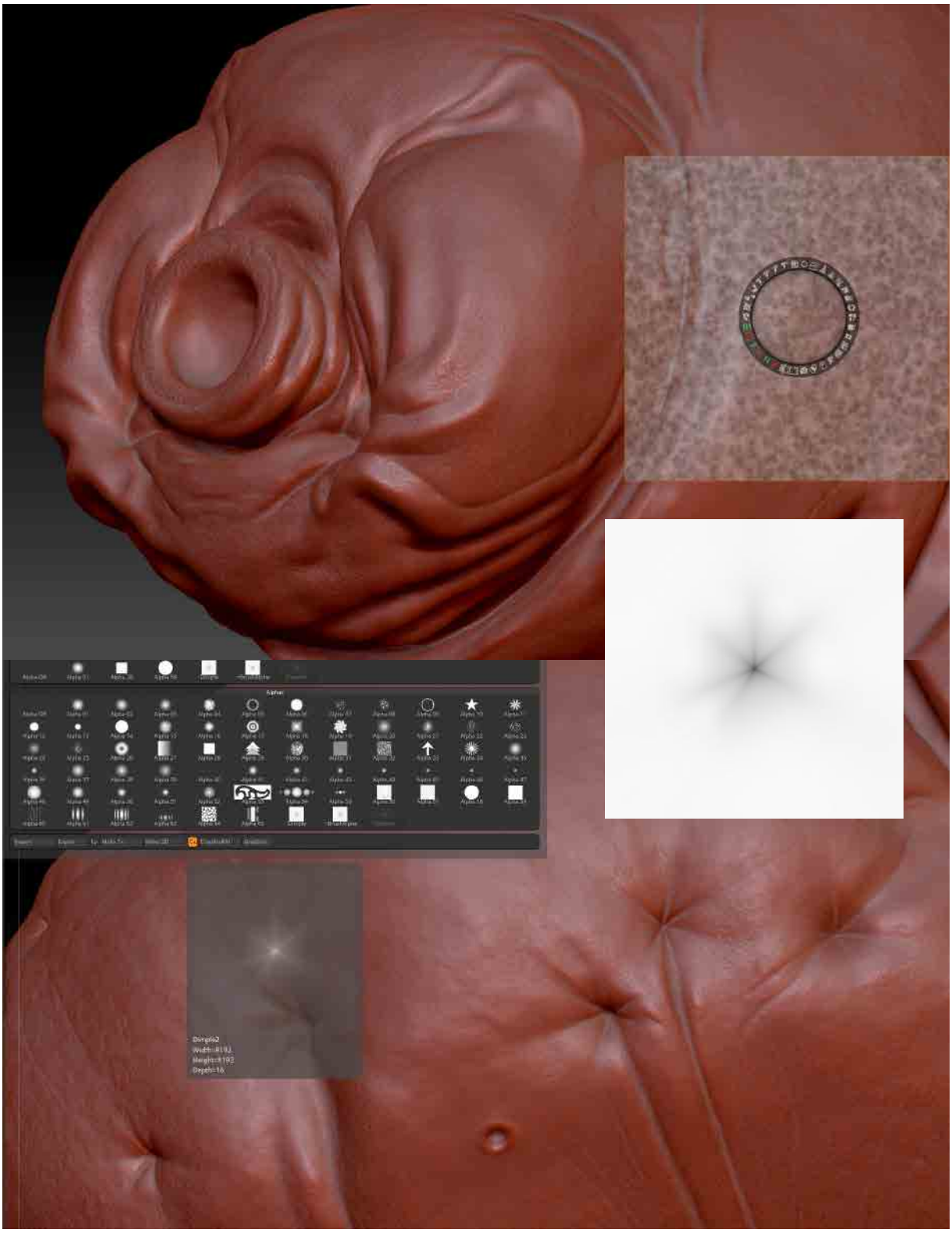


3. Base Mesh.

For this model, the relatively simple overall anatomy made it practical to begin directly in ZBrush using a Polysphere. Primary forms were established first before progressively refining the anatomy through Dynamesh sculpting.

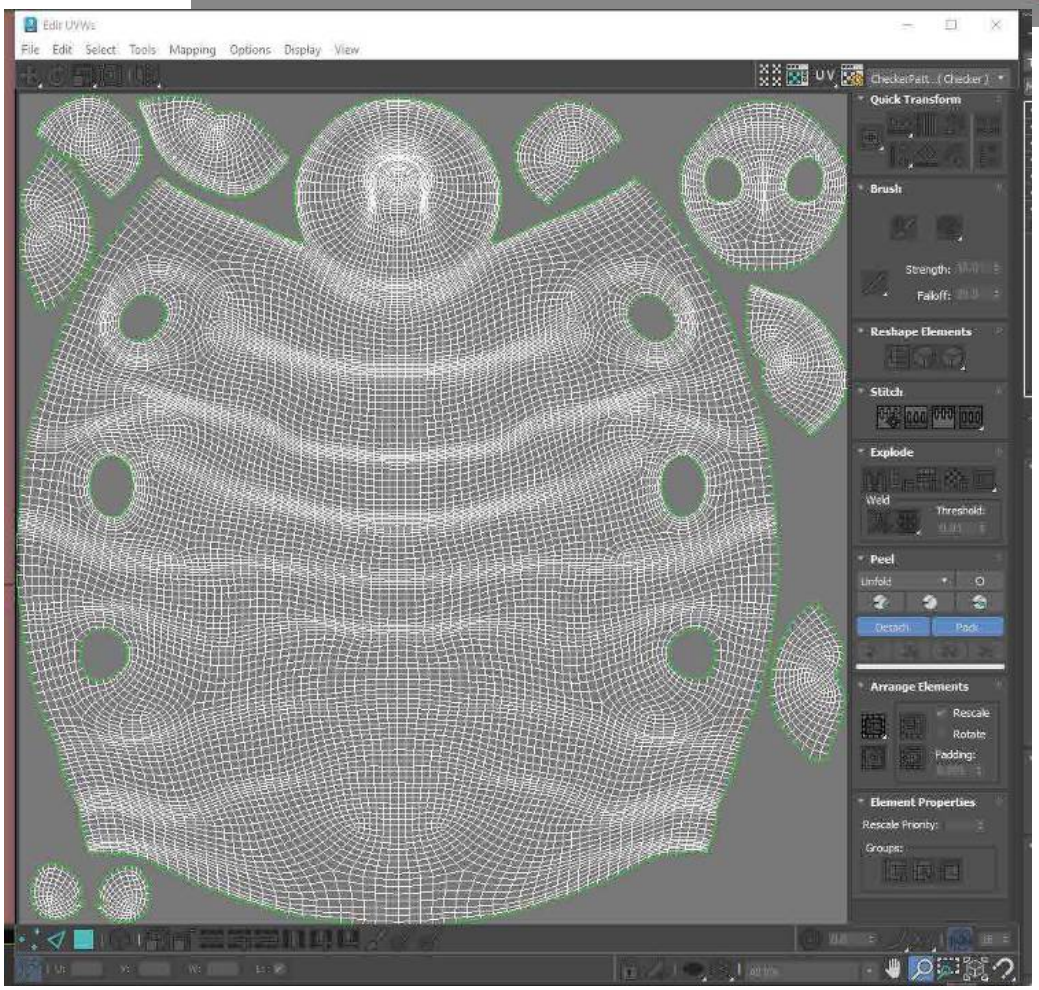
4. Details

Once the primary forms are established, I refine the secondary and tertiary details by sculpting folds and creases. Then Spotlight projection to bring out the details on the skin. Custom designed Alphas to aid in shaping the dimples, and other features.



5. Topology and UV Unwrapping.

Duplicate model. Polygroup limbs and mouth, retopologise with symmetry.
Export to 3D max, cut seams and Unwrap.



6. High-Resolution Detail Transfer

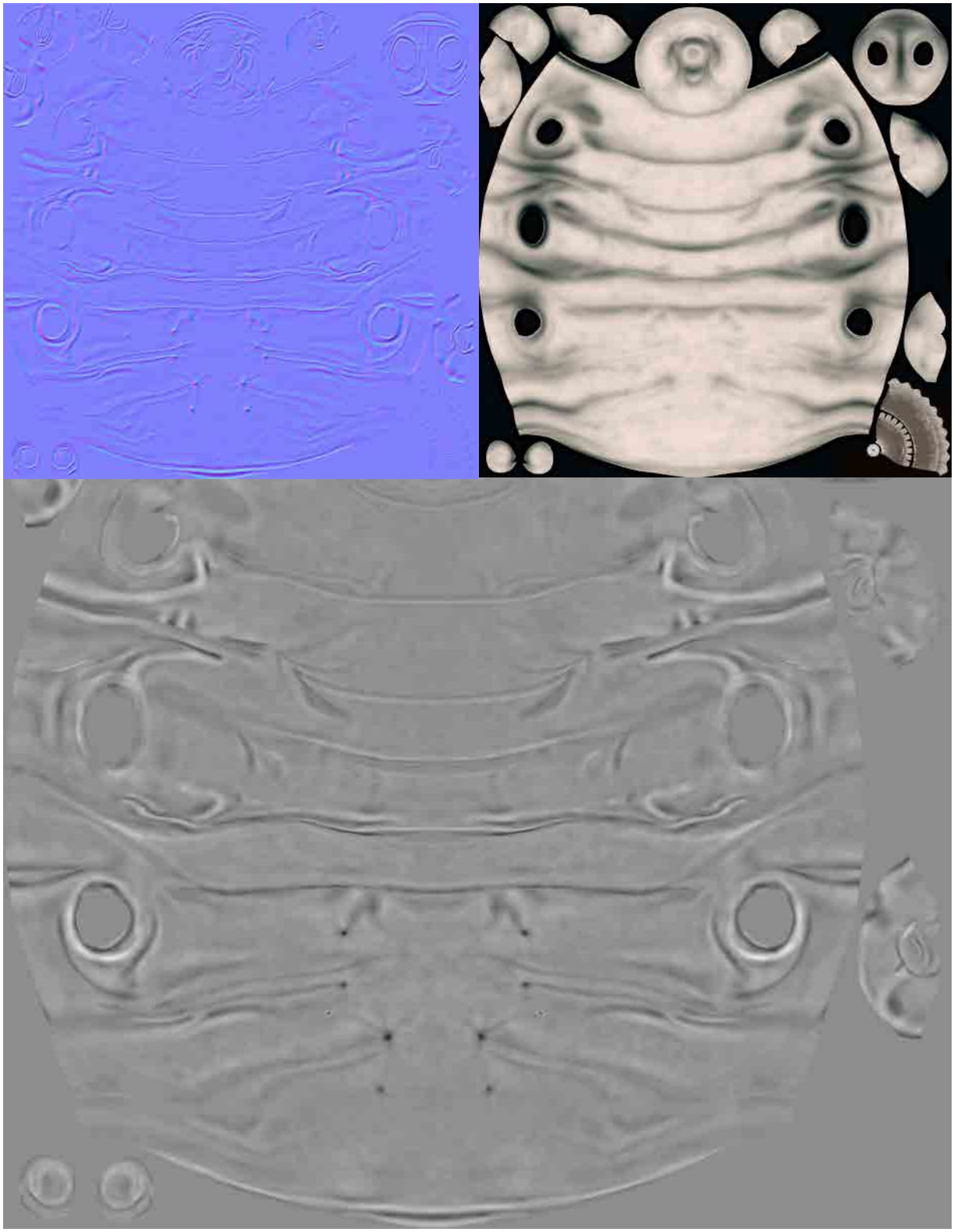
Return to ZBrush and project the high-resolution sculpted detail onto the clean retopologised, UV-unwrapped production mesh using SubTools. This preserves the original sculpt while creating an efficient model suitable for texturing, rigging and rendering.

7. Texture Painting.

This stage consists of a number of different processes, from directly painting, spotlight projection painting, texture to polypaint, masks to polypaint, and procedural maps.

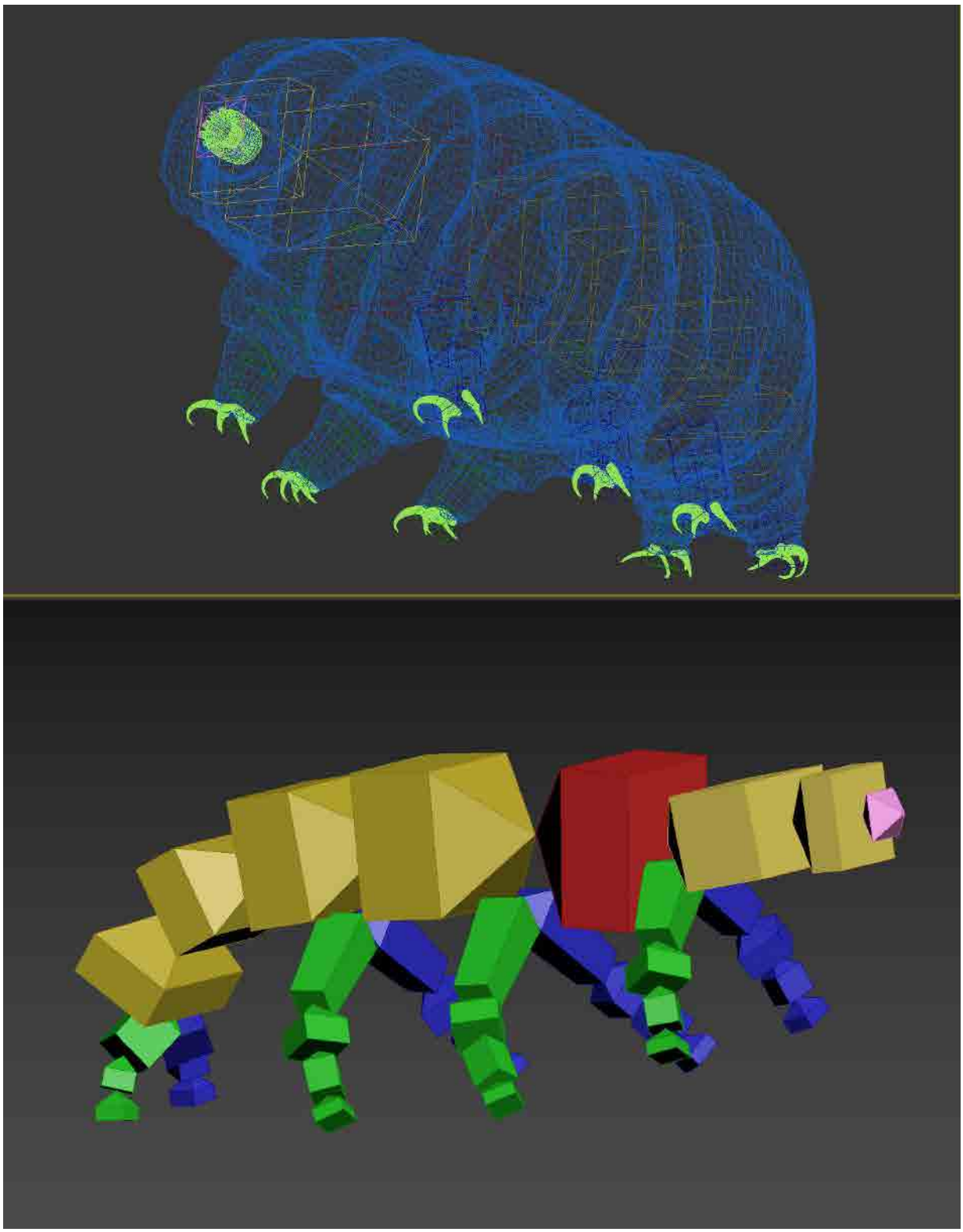
8. Extract Maps.

Generate the normal, displacement, ambient occlusion, diffuse, and bump maps required for the final material.



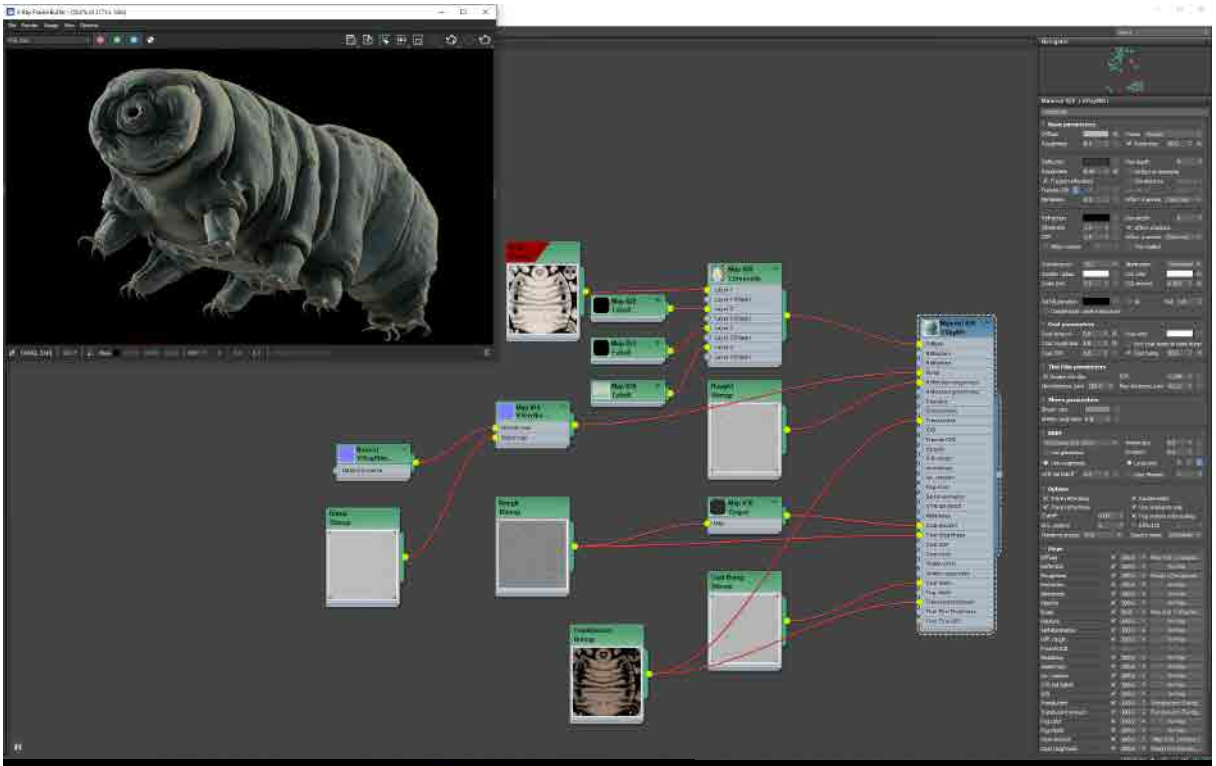
9. Skeleton and Rigging

Export low poly unwrapped mesh to 3D Max. Build the rig and skin the mesh to the skeleton.



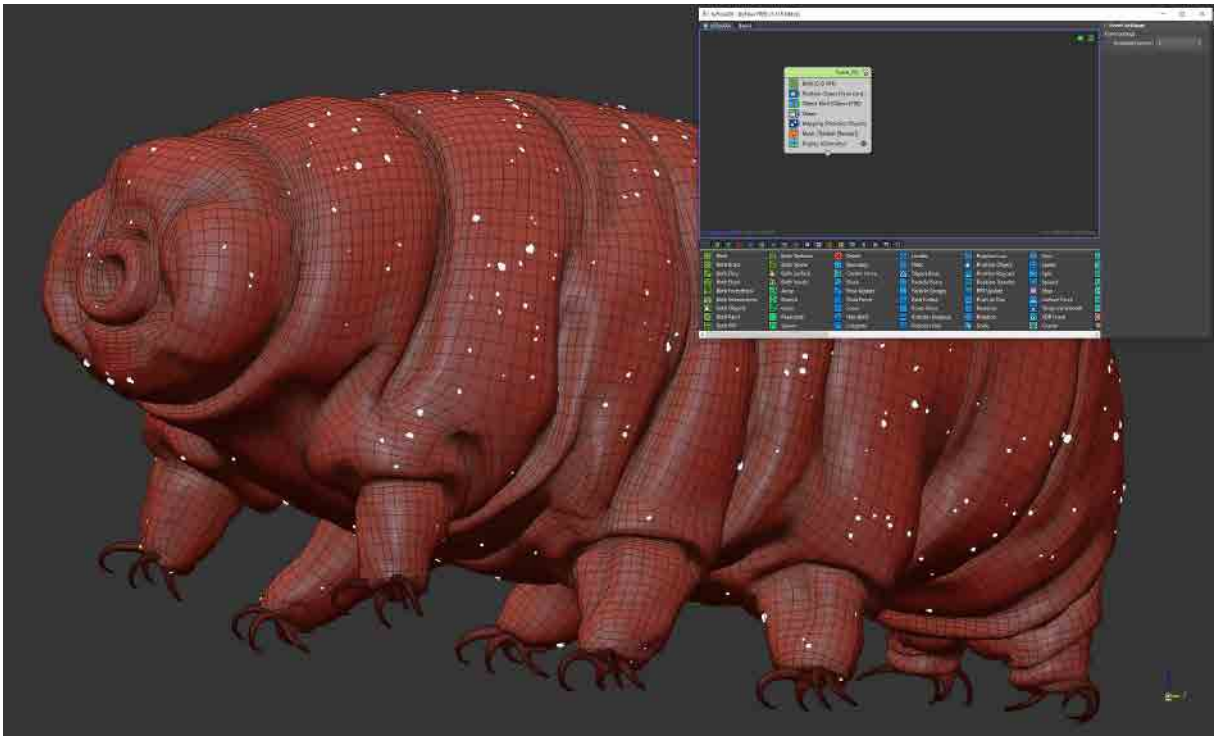
10. Set the lights and build the PBR materials.

Build a neutral lighting system, add the texture maps to the material with a standard PBR set up for cross-platform use. Turbosmooth, add displacement modifier with height map. Test render the model from multiple viewing angles.



11. Fine tuning and extra details.

Particle systems can be used to introduce microscopic surface variation and subtle artefacts that enhance realism. Final refinements are made to lighting, materials, shaders and texture maps before rendering.



12. Onto Post-Production

Pose the rig, Set the camera position, and settings. Prepare elements such as vray reflection and AO for compositing in post. Final checks and render.

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Tardi.VRayObjectID.0005.exrTardi.VRayReflection.0005.exr Tardi.VRaySpecular.0005.exr Tardi.VRayZDepth.0005.exr

Post Production

Colour and Compositing.

Hypsibius exemplaris

Common name: Water Bear

The workflow shown here represents one typical production pipeline. Individual projects are adapted according to the scientific subject, client requirements and intended application.