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Images and Movies for Current Biology Report

**Neandertal introgression sheds light   
on modern human endocranial globularity**

Philipp Gunz, Amanda K. Tilot, Katharina Wittfeld, Alexander Teumer, Chin Yang Shapland, Theo G.M. van Erp, Michael Dannemann, Benjamin Vernot, Simon Neubauer, Tulio Guadalupe, Guillén Fernandez, Han Brunner, Wolfgang Enard, James Fallon, Norbert Hosten, Uwe Völker, Antonio Profico, Fabio Di Vincenzo, Giorgio Manzi, Janet Kelso, Beate St. Pourcain, Jean-Jacques Hublin, Barbara Franke, Svante Pääbo, Fabio Macciardi, Hans J. Grabe, Simon E. Fisher.

**1\_Neandertal\_Modern\_Human\_Gunz\_Black.jpg**



**One of the features that distinguishes modern humans (right) from Neandertals (left) is a globular shape of the braincase.**​ ​​Left: Computed tomographic (CT) scan of a Neanderthal fossil (La Ferrassie 1). Right: CT scan of a modern human; the cranium was cut open virtually to reveal the inside of the braincase. Gunz, Tilot et al. combine paleoanthropology, archaic genomics, neuroimaging and gene expression to study biological foundations of the characteristic modern human endocranial shape. They find introgressed Neandertal alleles that associate with reduced endocranial globularity and affect expression of genes linked to neurogenesis and myelination. License: CC BY-NC-ND 4.0; Image by Philipp Gunz.

**Modern\_Human\_Rotation.mov**

Computed tomographic (CT) scan of a modern human cranium. License: CC BY-NC-ND 4.0; Animation by Philipp Gunz.

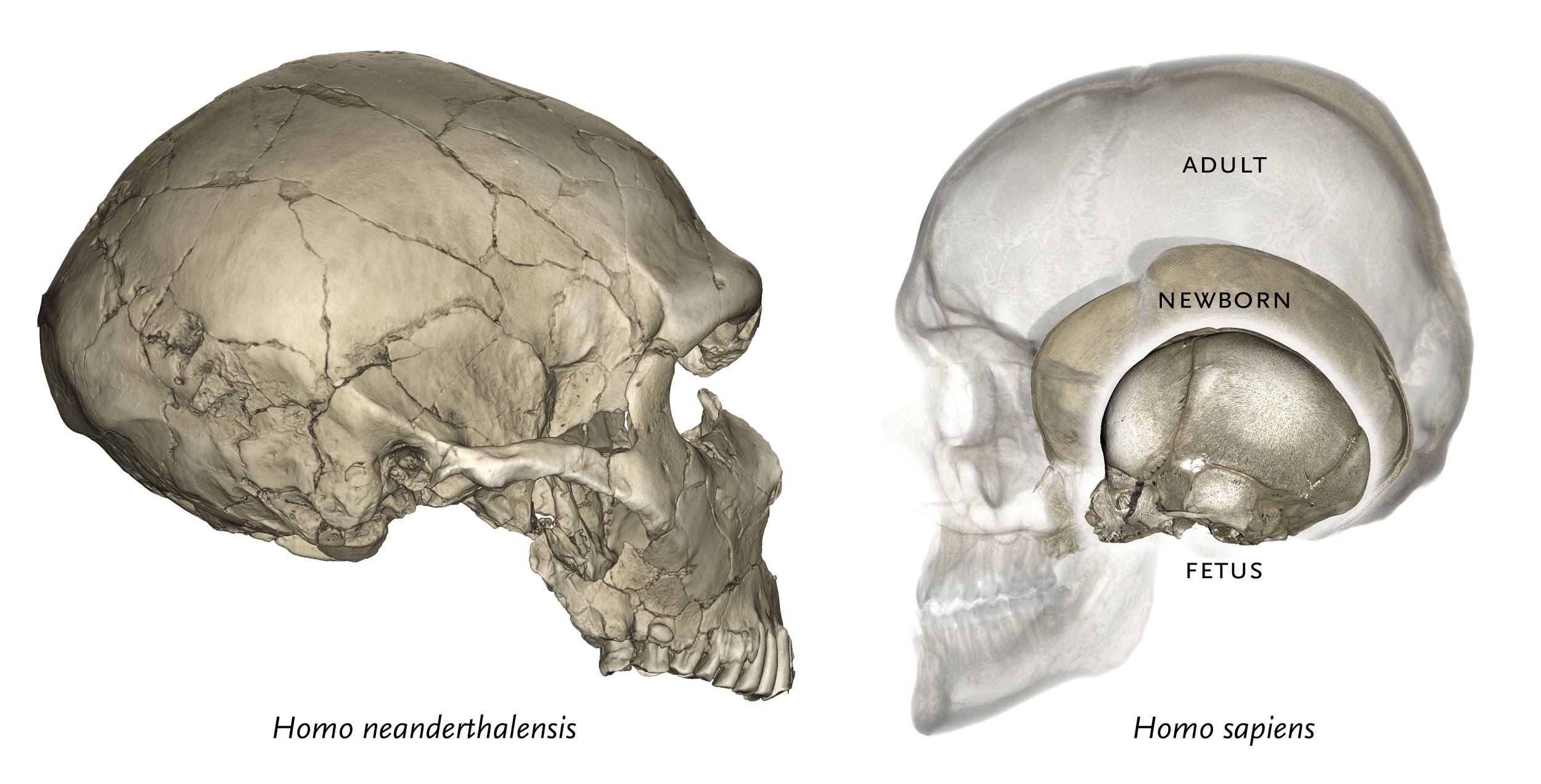
**Neandertal\_Rotation.mov**Computed tomographic (CT) scan of a Neandertal cranium. The original fossil specimen (La Ferrassie 1) is housed at the Musée de l’Homme in Paris. License: CC BY-NC-ND 4.0; Animation by Philipp Gunz.

**Neandertal\_Modern\_Human\_Rotation\_Together.mov**Computed tomographic (CT) scans of a Neandertal cranium (left) and a recent modern human (right). The original fossil specimen (La Ferrassie 1) is housed at the Musée de l’Homme in Paris. License: CC BY-NC-ND 4.0; Animation by Philipp Gunz.



**One of the features that distinguishes modern humans (right) from Neandertals (left) is a globular shape of the braincase.​** ​​Left: Computed tomographic (CT) scan of a Neanderthal fossil (La Ferrassie 1). Right: CT scan of a modern human; the cranium was cut open virtually to reveal the inside of the braincase. ​​Gunz, Tilot et al. combine paleoanthropology, archaic genomics, neuroimaging and gene expression to study biological foundations of the characteristic modern human endocranial shape. They find introgressed Neandertal alleles that associate with reduced endocranial globularity and affect expression of genes linked to neurogenesis and myelination. License: CC BY-NC-ND 4.0; Image by Philipp Gunz.

[2\_Neandertal\_Modern\_Human\_Gunz\_White.jpg]



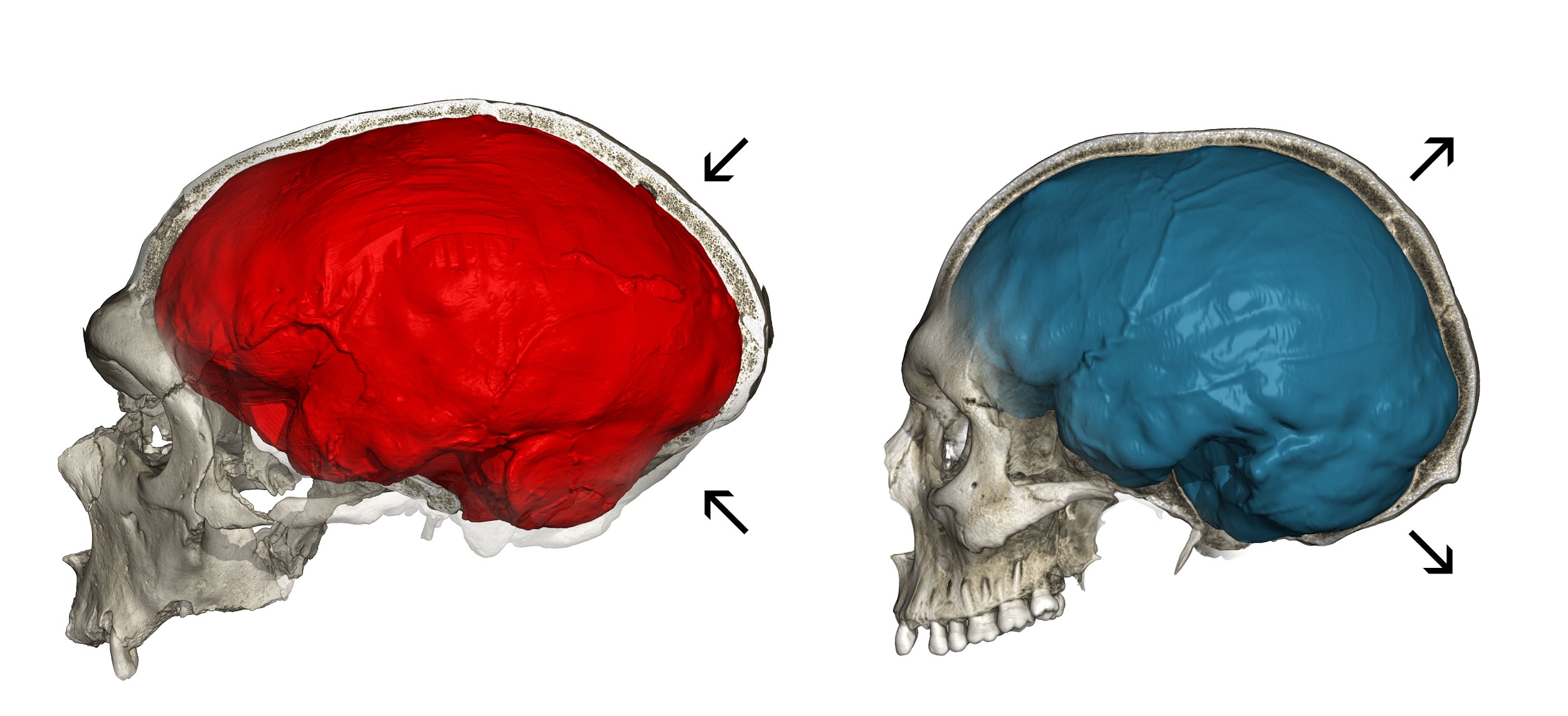
**One of the features that distinguishes adult modern humans (right) from Neandertals (left) is a globular shape of the braincase.​** In modern humans the globular endocranial shape emerges soon after birth (just like Neandertal neonates, modern human babies have elongated braincases and endocrania). This suggest evolutionary changes to early brain development. **Left**: Computed tomographic (CT) scan of a Neanderthal fossil (La Ferrassie 1). **Right**: Modern human CT scans of a fetus, a newborn, and an adult (semi-transparent surface). ​​Gunz, Tilot et al. combine paleoanthropology, archaic genomics, neuroimaging and gene expression to study biological foundations of the characteristic modern human endocranial shape. They find introgressed Neandertal alleles that associate with reduced endocranial globularity and affect expression of genes linked to neurogenesis and myelination. License: CC BY-NC-ND 4.0; Image by Philipp Gunz.

[3\_Neandertal\_Modern\_Human-lateral\_Ontogeny.jpg]



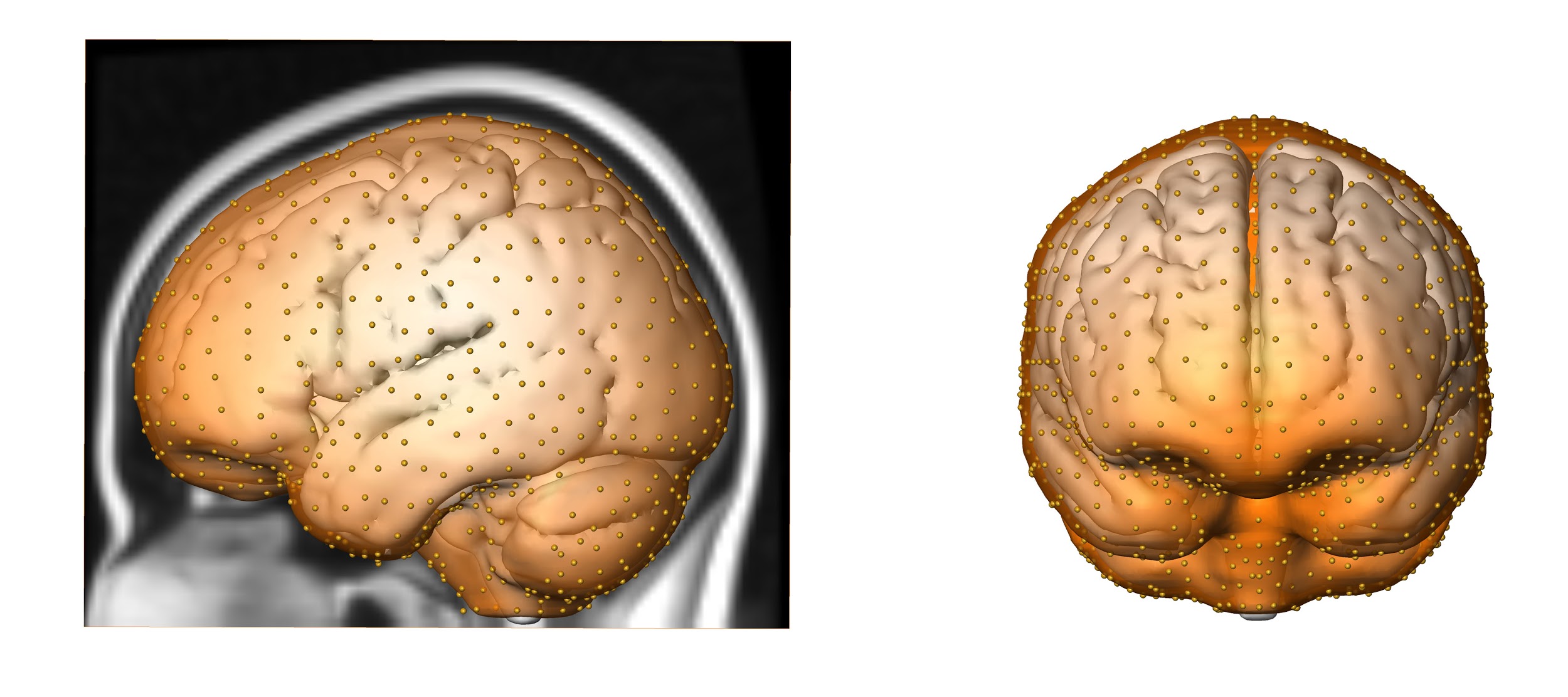
**One of the features that distinguishes modern humans from our extinct relatives is a globular shape of the braincase.​** ​​Gunz, Tilot et al. combine paleoanthropology, archaic genomics, neuroimaging and gene expression to study biological foundations of the characteristic modern human endocranial shape. They find introgressed Neandertal alleles that associate with reduced endocranial globularity and affect expression of genes linked to neurogenesis and myelination. License: CC BY-NC-ND 4.0; Image by Philipp Gunz.

[4\_Modern\_Human\_Gunz.jpg]



**One of the features that distinguishes modern humans from Neandertals is a globular shape of the braincase.**​ Left: Computed tomographic (CT) scan of the Neandertal fossil from La Chapelle-aux-Saints with a typical elongated endocranial imprint (red). Right: CT scan of a modern human showing the characteristic globular endocranial shape (blue). Arrows highlight the enlarged posterior cranial fossa (housing the cerebellum) as well as bulging of parietal bones in modern humans compared to Neandertals. ​​Gunz, Tilot et al. combine paleoanthropology, archaic genomics, neuroimaging and gene expression to study biological foundations of the characteristic modern human endocranial shape. They find introgressed Neandertal alleles that associate with reduced endocranial globularity and affect expression of genes linked to neurogenesis and myelination. License: CC BY-NC-ND 4.0; Image by Philipp Gunz.

[5\_Neandertal\_Modern\_Human\_Gunz\_Endocasts.jpg]



**One of the features that distinguishes modern humans from our extinct relatives is a globular shape of the braincase.​** ​​Gunz, Tilot et al. combine paleoanthropology, archaic genomics, neuroimaging and gene expression to study biological foundations of the characteristic modern human endocranial shape. They find introgressed Neandertal alleles that associate with reduced endocranial globularity and affect expression of genes linked to neurogenesis and myelination. Shown here are the coordinate measurements used to capture endocranial shape from magnetic resonance images of several thousand modern humans. License: CC BY-NC-ND 4.0; Image by Philipp Gunz.

[6\_Modern\_Human\_MRI\_Scan.jpg]