“We have failed the internet.”

– Mike Eisen

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Finding restaurants in 1929

Finding restaurants in 2019


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and the fate of the components of the claustrum region, we reinvestigated the changes in shape of the diencephalon, including its lumen, wall and surrounding mesenchyme in human embryos and fetuses between 4 and 10 weeks of development. Changes in size and shape were assessed qualitatively and quantitatively in 3D reconstructions to establish the growth pattern. We report that the diencephalon consisted of a ventral ‘growing’ cone initially sandwiched between cranial and dorsal ‘non-growing’ zones that account for the changes in caudal shape during the period studied.

Materials and methods

This study was undertaken in accordance with the Dutch regulations for the proper use of human tissue for medical research purposes. Anonymized specimens from the historical collections of human embryos of the Departments of Anatomy and Embryology, Leiden University Medical Center (LUMC), Leiden, Academisch Medisch Centrum (AMC), Amsterdam, and Radboud University, Nijmegen, The Netherlands, that were donated for scientific research were included. In addition, digital images of human embryos of the Carnegie collection (Washington, DC, USA) were downloaded from the Digitally Reproduced Embryonic Morphology (DREIM) project [http://virtualhumanembryos.hsc.uh.edu].

Image acquisition, 3D reconstruction and visualisation

Well-preserved human embryos and fetuses between 4 and 10 weeks of development were studied (Table 1). The criteria of O’Rahilly as modified in 2010 were used to determine the Carnegie Stage of development and post-fertilisation age of the embryos (O’Rahilly & Muller, 2010; Table 2). We subdivided CS14 into CS14-early, intermediate- and late: because of rapid developmental changes during this stage. The collection from which we selected the embryos studied (Table 2) amounts to ~150 embryos (collections in LURAC and AMC). Selection criteria were histological quality of the sections (embryos undergo autolysis (maceration) quite quickly) and developmental stage. The main limitation to use more embryos was the time required for their 3D reconstruction: scanning and aligning sections remain very time-consuming activities. Instead, we used quantitative [Figs 1 and 3] and qualitative [Figs 2] and [4] chronological development as our most important indicators for adequate description. Accordingly, developmental trends in our account are not based on a single developmental stage. Furthermore, the correlation coefficients that we report are characteristically > 0.8. If a discontinuity or a discrepancy with literature is found, we do check sections of the non-reconstructed group of embryos to confirm our findings.

Table 1. Sources of human embryos and fetuses

<table>
<thead>
<tr>
<th>Stage</th>
<th>Embryo number</th>
<th>Section plane</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>CS14</td>
<td>S0028</td>
<td>Transverse</td>
<td>DREIM</td>
</tr>
<tr>
<td>CS1</td>
<td>S0044</td>
<td>Transverse</td>
<td>DREIM</td>
</tr>
<tr>
<td>CS2</td>
<td>S0040</td>
<td>Transverse</td>
<td>DREIM</td>
</tr>
<tr>
<td>CS3</td>
<td>S0045</td>
<td>Transverse</td>
<td>DREIM</td>
</tr>
</tbody>
</table>

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Keywords

3D morphometry — anencephaly — blader — ungulate virus — unistriat raphe
The Internet has transformed nearly every aspect of life

https://www.youtube.com/watch?v=0XbdMOcMB4E
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Slow
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Closed
Draining

Open innovation

Fast
€
Open
User-friendly
Open innovation: Open-by-design

- Intentional, ordered, strategic, process-based, inclusive, open for revision
- When everything is open by design, people have a clear idea of how to be in an inclusive, collaborative community with others, how to get help, and how to recognise one another and their contributions

Credit to the Mozilla Open Leaders training programme (@MozOpenLeaders)
Why open innovation?

If closed:

- Propagate existing biases
- Un-reusable research

eLife Innovation’s vision is to create open, inclusive, user-centric research communication tools with the community.
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eLife Innovation Sprint: some projects and prototypes

2018
Plaudit: plaudit.pub
PREreview: prereview.org
Octopus: sciencepublishing.org
SwipesForScience: swipesforscience.org

2019
OpenScore: opensco.re

Hidden Preprints: hiddepreprints.org
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Reproducible Document Stack (RDS): capturing code, data and compute environment in a live paper
Reproducible Document Stack (RDS): A timeline

Collaboration began

Stencila

substance

Sep 2017

May 2018

First reproducible paper published
elifesci.org/reprodoc

eLife Innovation Sprint:
Binder-Stencila integration

Feb 2019

May 2019

Author workflow to enliven articles

Roadmap announced
elifesci.org/reprodoc2

Apr 2020

Stencila: stenci.la
Substance: substance.io
RDS updates: elifesci.org/RDSupdates

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What we learnt

- Researchers (users): interoperability, features
- Contributors: documentation, onboarding
- Publishers compatibility with existing workflows

RDS updates: elifesci.org/RDSupdates
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