# Resource Summary Report

Generated by nidm-terms on Jul 29, 2026

## Multi-Dimensional Human Embryo

RRID:SCR_006296
Type: Tool

### Proper Citation

Multi-Dimensional Human Embryo (RRID:SCR_006296)

### Resource Information

**URL:** http://embryo.soad.umich.edu/

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**Description:** Complete three-dimensional data set of reference magnetic resonance microscopy (MRM) images of the human embryo representing 10 stages of development for each of 18 human embryos representing Carnegie stages 10 through 23, a critical embryonic time period for organogenesis. The users of the collection are able to manipulate the data on their own personal computers to view any slice from any plane of sectioning. Dynamic rotational views of whole embryos and time-lapse views of the growing embryo are accessible. Each embryo was imaged with three magnetic resonance pulse sequences to obtain fully-registered T1-weighted, T2-weighted, and diffusion-weighted image datasets. A complete set of coronal, sagittal, and axial images were produced from each image data set. Several major organs were isolated from each T1-weighted embryo data set using image segmentation methods and separate image data sets were created to represent each of these organs. Additionally, each embryo was optically photographed under a low-power microscope. The formalin-fixed specimens came from the highly respected Carnegie Collection of Human Embryos. This is the first distributable work to document in three dimensions the anatomy of the human embryonic time period. Pseudo- time-lapse movies were created using morphing software to represent the fourth dimension (time). Carnegie stages are a system used by embryologists to describe the apparent maturity of embryos. An embryo is assigned a Carnegie stage (numbered from 1 to 23) based on its external features. This staging system is not dependent on the chronological age nor the size of the embryo. The stages, are in a sense, arbitrary levels of maturity based on multiple physical features. Embryos that might have different ages or sizes can be assigned the same Carnegie stage based on their external appearance because of the natural variation which occurs between individuals. Postovulatory age is frequently used by clinicians to describe the maturity of an embryo. It refers to the length of time since the last ovulation before pregnancy. Postovulatory age is a good indication of embryonic age because the time of ovulation can be determined and fertilization must occur close to the time of ovulation. The terms gestation, pregnancy, and conception are usually avoided in describing embryonic age

because fertilization is not universally accepted as the commencement of development (some consider implantation as the beginning of development). MRM was performed at the Center for In-vivo Microscopy at Duke University. Image processing and data managment was performed at the School of Art and Design, University of Michigan.

**Abbreviations:** Multidimensional Human Embryo

**Synonyms:** Multidimensional Human Embryo Project

**Resource Type:** data set, data or information resource, atlas, image collection, mri d image, video resource, reference atlas

**Keywords:** embryonic human, magnetic resonance imaging, development, carnegie stage, photo, animation, magnetic resonance microscopy

**Funding:** NICHD

**Availability:** Available to any interested researcher, Student, Or clinician.

**Resource Name:** Multi-Dimensional Human Embryo

**Resource ID:** SCR_006296

**Alternate IDs:** nlx_151965

**Record Creation Time:** 20220129T080235+0000

**Record Last Update:** 20260729T044134+0000

## Ratings and Alerts

No rating or validation information has been found for Multi-Dimensional Human Embryo.

No alerts have been found for Multi-Dimensional Human Embryo.

## Data and Source Information

**Source:** SciCrunch Registry

## Usage and Citation Metrics

We found 2 mentions in open access literature.

**Listed below are recent publications.** The full list is available at nidm-terms .

Hikspoors JPJM, et al. (2022) A pictorial account of the human embryonic heart between 3.5 and 8 weeks of development. Communications biology, 5(1), 226.

Vasung L, et al. (2019) Ex vivo fetal brain MRI: Recent advances, challenges, and future directions. NeuroImage, 195, 23.