

59. Early Mammalian Development: from Preimplantation to Gastrulation

1 unit, Kat Hadjantonakis, November 24th, 2025

Overview:

- Cell lineage specification in the blastocyst
- Simple cell layers to differentiated cell types in 3D
- Tissue patterning and cross-talk
- Cell movement, migration and epithelial to mesenchymal transition (EMT)

Background reviews:

The role of polarization and early heterogeneities in the mammalian first cell fate decision.

Lamba A, Zernicka-Goetz M. Curr Top Dev Biol. 2023;154:169-196. doi:

10.1016/bs.ctdb.2023.02.006. Epub 2023 Mar 21. PMID: 37100517

Coordination between patterning and morphogenesis ensures robustness during mouse development.

Saiz N, Hadjantonakis AK. Philos Trans R Soc Lond B Biol Sci. 2020 Oct

12;375(1809):20190562. doi: 10.1098/rstb.2019.0562. Epub 2020 Aug 24. PMID: 32829684

Papers for Discussion:

Temporal BMP4 effects on mouse embryonic and extraembryonic development.

Hadas R, Rubinstein H, Mittnenzweig M, Mayshar Y, Ben-Yair R, Cheng S, Aguilera-Castrejon A, Reines N, Orenbuch AH, Lifshitz A, Chen DY, Elowitz MB, Zernicka-Goetz M, Hanna JH, Tanay A, Stelzer Y. Nature. 2024 Sep 18. doi: 10.1038/s41586-024-07937-5. Online ahead of print. PMID: 39294373

To be discussed as a “Scientific Court” – For/against arguments.

Group A – “FOR”

Magnus, Karina – Group Leader

Afroz, Jalwa

Ahmed, Nibras

Beattie, Kai

Styers, Hannah

Sussman, Carleigh

Group B – “AGAINST”

McIlhenny, Lauren – Group Leader

Li, Faye

Mutaher, Mohammed

Pope, Eleanor

Volpe, Christina