

# FASSBERG

## SEMINAR SERIES



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**Claudia Gerri**  
**Francis Crick Institute**  
**London, UK**

### **Trophoblast specification and specialization from pre-implantation development to placentation**

Current understandings of cell specification in early mammalian pre-implantation development are based mainly on mouse studies. The first lineage differentiation event occurs at the morula stage, with outer cells initiating a trophectoderm (TE) placental progenitor program. The inner cell mass arises from inner cells during subsequent developmental stages and comprises precursor cells of the embryo proper and yolk sac<sup>1</sup>. Recent gene-expression analyses suggest that the mechanisms that regulate early lineage specification in the mouse may differ in other mammals, including human and cow. Here we show the evolutionary conservation of a molecular cascade that initiates TE segregation in human, cow and mouse embryos. At the morula stage, outer cells acquire an apical–basal cell polarity, with expression of atypical protein kinase C (aPKC) at the contact-free domain, nuclear expression of Hippo signalling pathway effectors and restricted expression of TE-associated factors such as GATA3, which suggests initiation of a TE program. Furthermore, we demonstrate that inhibition of aPKC by small-molecule pharmacological modulation or Trim-Away protein depletion impairs TE initiation at the morula stage. Our comparative embryology analysis provides insights into early lineage specification and suggests that a similar mechanism initiates a TE program in human, cow and mouse embryos.

**Host: Marina Rodnina**



**Monday / 25.01.2021 / 11:00**

zoom access data will be mailed before the seminar!

