



FROM ZYGOTE TO BLASTOCYST: WHY MORPHOLOGY STILL MATTERS

DR. THOMAS EBNER

Department of Gynaecology, Obstetrics and Gynaecological Endocrinology, Kepler University Hospital, Johannes Kepler University, Linz, Austria

Despite the rise of molecular diagnostics and time-lapse imaging in assisted reproductive technologies, morphological assessment remains a vital tool in evaluating early embryo development. This presentation revisits the journey from zygote to blastocyst, highlighting how traditional morphological markers - such as planar cleavage, stage appropriateness, cytoplasmic pitting, fragmentation, and early blastocyst formation - continue to offer practical, non-invasive insights into embryo viability. The strengths and limitations of morphology-based selection, its correlation with implantation potential, and how it complements emerging technologies like AI-driven image analysis and omics profiling will be explored. By integrating classical and modern approaches, it is argued that morphology is not obsolete—but evolving.

Take Home Messages

- ☞ Morphology remains clinically relevant and most embryologists around the world still rely on static morphology
- ☞ Morphological assessment remains a skill-dependent process, highlighting the importance of standardized grading systems
- ☞ Morphology, when combined with emerging technologies like AI and omics, enhances decision-making in the IVF lab

GAMETE ACTIVATION TO IMPROVE OUTCOMES IN ART

DR. THOMAS EBNER

Department of Gynaecology, Obstetrics and Gynaecological Endocrinology, Kepler University Hospital, Johannes Kepler University, Linz, Austria

Gamete activation is a pivotal step in achieving successful fertilization and early embryonic development, yet it remains a challenge in certain ART scenarios—particularly in ICSI cycles with unexplained fertilization failure or severe male factor infertility. This presentation focuses on the mechanisms of oocyte and sperm activation, with an emphasis on how embryologists can apply targeted activation strategies to improve clinical outcomes. We will discuss the use of theophylline and calcium ionophores, and timing considerations in artificial sperm and oocyte activation (AOA), supported by case-based evidence and lab protocols. Special attention will be given to safety, reproducibility, and the integration of activation techniques into routine workflows. By refining activation protocols, embryologists can play a critical role in enhancing fertilization rates and optimizing embryo development, especially in challenging cases.

Take Home Messages

- ☞ Understanding the underlying mechanisms of sperm and oocyte activation is key in order to select the correct patient cohort
- ☞ Integrating activation protocols into routine lab practice requires careful consideration of timing and safety
- ☞ Chemical activation is the preferred method and can potentially be used in fresh and frozen gametes