

HUMAN EMBRYOLOGY – DENTISTRY

Presentation topics and required content – winter semester 2026/2027

Presentation topic / Lecturer	Required presentation content
GAMETOGENESIS: MEIOSIS, OOGENESIS AND SPERMATOGENESIS S. Borska	1. Gametogenesis – origin and migration of primordial germ cells; general principles of gamete formation. 2. Meiosis – stages of meiosis I and II, chromosome segregation and meiotic errors. 3. Oogenesis – development and maturation of female germ cells and ovarian follicles. 4. Spermatogenesis and spermiogenesis – stages of male germ-cell development and maturation.
1ST WEEK: OVULATION TO IMPLANTATION S. Borska	1. Ovarian cycle – follicular and luteal phases, hormonal regulation and ovulation. 2. Uterine (menstrual) cycle – menstrual, proliferative, secretory and ischaemic (premenstrual) phases; relationship between ovarian hormones and changes in the endometrium. 3. Fertilisation – capacitation, acrosome reaction, sperm-oocyte interaction, cortical reaction and formation of the zygote. 4. Cleavage, blastocyst formation and implantation – cleavage divisions, morula, blastocyst formation and hatching from the zona pellucida; stages of implantation, early trophoblast development and selected abnormalities of fertilisation and implantation.
2ND-3RD WEEK: GERM DISCS A. Piotrowska	1. Day 8 of development – partial implantation of the blastocyst; differentiation of the trophoblast into cytotrophoblast and syncytiotrophoblast; formation of the epiblast and hypoblast; appearance of the amniotic cavity. 2. Day 9 of development – deeper implantation; lacunar stage of the trophoblast; formation of the exocoelomic membrane and primary yolk sac. 3. Days 11-12 of development – completion of implantation; formation of the lacunar network; initial formation of the extraembryonic mesoderm and chorionic cavity; decidual reaction. 4. Day 13 of development – restoration of the endometrial surface; initial appearance of the connecting stalk, secondary yolk sac and primary chorionic villi. 5. Gastrulation – formation of the primitive streak, cell migration and establishment of the trilaminar germ disc. 6. Formation of the notochord – notochordal process, notochordal plate and definitive notochord. 7. Establishment of the embryonic body axes – basic mechanisms involved in establishing the cranial-caudal, dorsal-ventral and left-right axes.
3RD-8TH WEEK: ORGANOGENESIS, EMBRYONIC PERIOD K. Jabłońska	1. Derivatives of the ectoderm. 2. Neural crest cell derivatives. 3. Derivatives of the mesodermal germ layer – paraxial, intermediate and lateral plate mesoderm. 4. Derivatives of the endodermal germ layer – the gut tube and formation of the body cavities.
HEAD, NECK AND TEETH DEVELOPMENT S. Borska	1. Neural crest cells in craniofacial development – migration and major derivatives in the head and neck. 2. Pharyngeal arches, pouches, clefts and membranes – development and derivatives. 3. Development of the face – facial prominences and intermaxillary segment. 4. Development of the palate and oral cavity – primary and secondary palate. 5. Development of the tongue – major stages. 6. Early tooth development – dental lamina; bud, cap and bell stages; enamel organ, dental papilla and dental follicle; differentiation of odontoblasts and ameloblasts, dentinogenesis and amelogenesis. 7. Basic aspects of tooth eruption. 8. Developmental abnormalities of the teeth and craniofacial region – selected clinically important craniofacial and pharyngeal apparatus abnormalities, including cleft lip and cleft palate, selected abnormalities of tooth number, size, shape and structure; enamel and dentine defects.