

Embryology Vocab List

Spermatogenesis	1st stage of sperm production, only meiotic divisions to form spermatids
Spermogenesis	2nd stage of sperm production, cell maturation to sperm
Oogenesis	maturation and meiosis together, single stage process
Theca Interna	signals uterine to proliferate and tells brain that uterus is prepared FSH and LH stimulates theca interna to produce estrogen to promote growth
Follicular Cells	cells that surround egg in the ovary
Corona Radiata	cells that directly surround egg, just outside zona pellucida
Capacitation	Removal of glycoprotein covering by secretions from uterine and fallopian walls to allow sperm to penetrate corona radiata
Morula	12-16 cells stage, 3rd day after fertilization; no increase in size; ready to enter uterus
Blastula (Blastocyst)	16-32 cells, starts to form blastocyst cavity
Embryoblast	inner cell mass of blastocyst cavity that forms the embryo itself
Trophoblast	outer cell layer to form extra-embryonic structures including the placenta Produces proteases that lyse zona pellucida (necessary for adhering to uterus) Divided into cytotrophoblast and syncytiotrophoblast
Cytotrophoblast	single cell layer surrounding embryonic mass, underneath syncytiotro. forms secondary villi, and gives rise to syncytiotro.
Syncytiotrophoblast	multinucleated cell mass that breaks down walls of uterine glands and blood v. Secretes HCG, prostaglandins, and proteases; Forms primary villi, outermost layer of embryo
Chorion	fetal part of placenta from trophoblast layers
Decidua	maternal part of placenta from endometriurn
HCG	Human Chorionic Gonadotropin used in pregnancy test; secreted by syncytiotrophoblast and travels to ovary to act on corpus luteum to secrete progesterone to maintain pregnancy.
Epiblast	single layer between amniotic cavity and hypoblast, primitive ectoderm
Hypoblast	single layer next to blastula cavity, primitive endoderm
Primitive Yolk Sac	former blastocyst cavity, connected to future GI tube; RBCs are formed here
Amniotic Cavity	derived from epiblast, becomes fluid filled and lies in chorionic cavity; holds embryo
Extra-embryonic mesoderm	Develops between cytotropho. outside and yolk sac inside.
Chorionic Cavity	Cavity within extra-embryonic mesoderm that separates embryo from fetal contribution of placenta; Outside lies fetal chorionic tissue and decidua
Decidua Basalis	Beneath chorionic villi
Decidua Capsularis	Surround structures of embryo
Decidua Parietalis	Covers wall of uterus
Amnion	Layer of cells around amniotic cavity
Gastrulation (wk.3)	Process of forming 3 cell layers instead of 2 layers
Primitive Streak	Depression on surface of epiblast that grows towards head; Forms initial axis of embryo
Primitive Node (pit)	Most cranial extension of primitive streak
Endoderm	First epiblast cells that migrate into the primitive node and push the hypoblast cells into the periphery, so these hypoblast cells form the endoderm; Forms <u>longitudinal tube from mouth to anus</u> ; Forms <u>only epithelia</u> including GI tract, respiratory, thyroid, liver, pancreas
(wk 3-8 differentiation)	
Yolk Sac Lining	Hypoblast cells that were pushed into the periphery migrate down over interior surface of blastocyst cavity and transform it into the yolk sac.
Mesoderm	Formed from later migrating epiblast cells that migrate between the two layers
(wk 3-8 differentiation)	Gives rise to muscle, CT, cartilage, bone, epithelia
Ectoderm	Rest of epiblast cells on top layer
(wk 3-8 differentiation)	Forms <u>all nervous tissue</u> + some epithelia
Notochord	Epiblast cells that migrate through the primitive node in a straight line towards the cranial end; Becomes part of mesoderm layer under ectoderm 1st specialized region of ectoderm to form; Forms vertebral column Grows till prochordal plate (mouth) where ectoderm and endoderm fuse Induces neural plate to become neural tissue
Prochordal Plate	Site of mouth, ectoderm and endoderm fused

Cloacal Membrane	Site of anus, ectoderm and endoderm fused
Neural Plate	Bulging midline region of ectoderm to become neural <u>tissue</u> of body Neural plate = neural tube + neural crest so all nervous tissue is from ectoderm
Neural Groove	Midline depression in ectoderm of neural plate
Neural Tube	Fused neural folds separated from overlying tissue; <u>Becomes CNS</u> (brain + spinal cord)
Neural Crest	<u>Forms PNS</u>
Teratogens	Materials that cross the placenta from the mother; Vitamin A at high levels <u>Biggest harmful effect at wk 3-8</u> , at wk 1-2 will probably kill baby
Paraxial Mesoderm	Organized into somitomeres which organize into somites (42-44 pairs) Three regions of development: sclerotome, myotome, and dermatome
Sclerotome	Surround notochord to become <u>vertebral column and ribs</u>
Nucleus Pulposus	Notochord center of intervertebral disks
Myotome	All <u>skeletal muscle</u>
Dermatome	Forms Dermis under ectoderm (epidermis)
Intermediate Mesoderm	Forms <u>Urinary and Genital systems</u> . Forms two bulges: <u>mesonephros and gonad</u>
Lateral Plate Mesoderm	Separates into two layers: Splanchnic and Somatic. Forms mesentery
Splanchnic	Forms <u>walls of gut</u> (CT and muscle), <u>peritoneal, pleural pericardial, CV system</u>
Somatic	Forms <u>BONE, CT of deep layer of lateral and ventral body walls and limbs</u>
Limb Bud	Mass of mesenchyme from somatic layer of lateral plate covered by ectoderm
Apical Ectodermal Ridge	region of ectoderm at tip which directs growth.
Congenital Malformations	defects present at birth caused by teratogenic agents
Spina Bifida	Occulta - failure of embryonic halves of vertebral arch to fuse Meningocele - meninges exposed through gap in spine, covered only by skin Meningomyelocele - protruding spinal cord nerve roots
Rachischisis	Incomplete closure of neural tube for failure of the vertebrae to fuse
Amelia/meromelia	Total (amelia) or partial (meromelia) absence of extremities
Polydactyly	Extra fingers or toes
Syndactyly	Abnormal fusion of fingers and toes
Achondroplasia	Short limbs
Brachydactyly	Short fingers and toes
Angiogenic Clusters	Epiblast cells that migrate through the primitive streak and out of neural plate, ending up in the splanchnic mesoderm of both lateral plates. Give rise to all tissues of heart and major vessels in and out of heart
Endocardial Tubes	Angiogenic cell clusters hollow out to form tube; Fuse to become endocardium of heart
Myocardial Tubes	Tube enveloping endocardial tube
Cardiac Jelly	Separating endocardium and epimyocardium (myocardium). Secreted by epimyocardium to help differentiation
Primitive Atrium	Forms (most of) right and (all of) left atria
Primitive Ventricle	Forms Left Ventricle
Bulbous Cordis	Forms Right Ventricle
Truncus Arteriosus	Forms <u>Walls of Pulmonary artery and Aorta</u>
Trabeculated vs. Non-trabeculated	Trabeculated - walls lined with projections to help pumping of blood
Atrioventricular Canal	Partitions heart into left and right AV canal by Superior and Inferior endocardial cushions
Septum Primum	Forms Valve of oval foramen
Oval Foramen	Passes blood from right to left atrium directly
Septum Secundum	Forms Oval Foramen
Aorticopulmonary Septum	Forms Division of Outflow Tube
Inf. and Sup. Cushions	Forms <u>endocardial covering and CT of valves</u>
Aortic Arches:	
3rd	common carotid
4th	on left - aorta, on right - right subclavian
6th	pulmonary arteries. In fetus left side is ductus arteriosus
Ant./Post cardinal veins	Become inf/sup vena cava
Umbilical v/a.	artery comes off dorsal aorta and goes to placenta

	vein originates in the placenta and umbilical cord -> liver -> sinus venosus -> heart
Vitelline Veins	Around yolk sac, later to become Sup. Mesenteric V.
Pharyngeal Arches	Forms <u>Head and Neck</u> ; five of them 1,2,3,4,6
	Outpouchings of endoderm tube, with migratory myotomes
Arch I	Forms <u>Mandibular and Maxillary ant. 2/3 tongue</u> process including cartilage and muscle
Arch II	Forms <u>Superficial muscles of face, and hyoid cartilage</u>
Arch III	Forms <u>Cartilage and muscles in neck</u>
Arch IV	Merge to form <u>Laryngeal cartilage. muscles of palate, pharynx larynx</u>
Stomodeum	opening to endoderm tube (mouth and nose)
Aortic Arches off	Aortic arch arteries invade pharyngeal arches from developing out-flow of heart
Pharyngeal Arches	
Aortic Arch III	Forms <u>Carotids</u> (common and internal)
Aortic Arch IV (left)	Forms <u>Aortic Arch</u>
Aortic Arch IV(rt)	Forms <u>Rt. Subclavian A.</u>
Aortic Arch VI	Forms <u>Pulmonary Arteries</u>
Aortic Arch VI (left)	Forms <u>Ductus Arteriosus</u>
Pharyngeal Clefts	Formed from invagination of ectoderm around pharyngeal arch
Cleft I	Forms External Ear
Cleft II-IV	Obliterated by pharyngeal arch II growing over. If not full closure then get cervical cyst
Pharyngeal Pouches	Invaginations on endodermal surface around pharyngeal arch
Pouch I	Forms Lining of <u>Middle Ear. Pouch I and Cleft I</u> meet to for <u>Ear drum</u>
Pouch II	Forms epithelia of <u>Palatine Tonsile</u>
Pouch III	Forms epithelia of <u>Thymus and Inf. Parathyroid</u>
Pouch IV	Forms <u>Superior Parathyroid, and C-Cells</u>
Thyroglossal Duct	Outpouching of endoderm to form epithelia thyroid gland
Foramen Cecum	Attachment site on endoderm of thyroglossal duct
Laryngeal Orifice	Origin of respiratory system
Pancreatic Diverticula	Endoderm diverticula that grow into splanchnic mesoderm to form epithelial lining of pancreas
Hepatic diverticulum	grows into splanchnic mesoderm & septum transversum (somatic lateral plate mes)
Spleen	Formed from <u>Splanchnic Mesoderm</u> within dorsal mesentery
Foregut	Consists of <u>stomach, 1st part of duodenum</u> supplied by celiac artery
Dorsal Bud	Forms part of <u>pancreas</u> , at least the major functional cells and glands in pancreas
Ventral Bud	Forms <u>liver, gallbladder, and pancreas (pancreatic duct)</u>
Midgut	Consists of <u>duodenum (past 1st part), jejunum, ileum, and 1st part of large intestine (ascending and proximal 2/3 of transverse)</u> , supplied by sup. mes. a.
Dorsal Mesentery	Forms <u>Dorsal Mesogastrum</u> (dorsal mesocolon, greater omentum, gastrolenal and lienorenal ligaments)
Ventral Mesentery	Forms lesser omentum (hepatogastiric and hepatoduodenal lig.), falciform lig, coronary and triangular lig.
Stenosis or Atresia of Esophagus	Newborn vomits food because of narrowing of esophagus (stenosis) or complete blockage (atresia) due to error in esophagotracheal septum division
Fistula	Opening between esophagus and trachea
Stenosis or Atresia of Pylorus	Muscle of pylorus becomes hypertrophied resulting in severe vomiting
Stenosis or Atresia of Duodenum	Solid lumen of alimentary canal due to error in recanalization
Recanalization	Breaks up solid lumen
Stenosis or Atresia of Anal Canal	Imperforate anus - anus never reaches outside of body
Ornphalocele	Intestines don't retract from umbilical cord into abdominal cavity
Congenital Umbilical Hernia	No skin and muscle layers around umbilicus so loops herniate again after retraction
Meckel's Diverticulum	2-4% Vitelline duct persists forming <u>outpocketing of ileum</u>
Glomeruli	Derived from dorsal <u>aorta</u>
Pronephros	Transient non-functional kidney formed from <u>intermediate mesoderm.</u>

Mesonephros	By end of 4th week pronephric system has disappeared Formed during regression of pronephric system and degenerates by 2.5 mos. Forms from unsegmented intermediate mesoderm -> nephrogenic chords and acquires glomerulus from dorsal aorta. At other end of tubule enters into Mesonephric duct from cranial portion of int. mesoderm to merge with cloaca (terminal portion of hindgut) Gonad forming on medial side (<u>urogenital ridge</u>)
Metanephros	From <u>Ureteric bud</u> and <u>Metanephric Blastema</u> --> kidney
Uteric Bud	Forms <u>collecting</u> portion of kidney (calices, renal pelvis) and ureter
Metan. Blastema	Forms <u>excretory</u> portion of kidney (Bowman's capsule, PCT, Henle, DCT)
Metanephric tissue cap	Cover for distal end of collecting tubule Form renal vesicles -> nephrons
Pelvic Kidney	One kidney <u>can't pass through embryologic fork formed by umbilical arteries</u>
Horseshoe kidney	Fusing of two kidneys
Urorectal Septum	4-7 wks. Divides cloaca to <u>anorectal canal</u> and <u>primitive urogenital sinus</u>
Urogenital Sinus	Forms bladder (proximal) and urethra (distal) with epi. of ENDODERMAL origin
Mesonephric Ducts	Opens into UG sinus and have epi of MESODERMAL origin w/ mucosa of bladder and ureters. Persist in male, degenerate in female Forms efferent ducts, epididymis, vas deferens, seminal vesicle, and ejaculatory duct
Polycystic Kidneys	Nephrons don't properly connect with collecting duct
Renal Agenesis	Failure of ureteric buds to develop
Sex Cords	Structures formed from invagination caused by epithelium or gonad growing into (mesoderm. Derived from mesodermal epithelium) Ability of fetus to develop into male or female. Prior to 8wks.
Indifferent Stage	
Tunica Albuginea	Thick CT layer of former sex cord, after germ cells have settled in male gonad
Seminiferous Tubules	Reorganized sex cords.
Rete Testis	Reorganized sex cords in medullary region of gonad
Sertoli Cells	Directs maturation of sperm formed from mesodermal epi of sex cords
Spermatogonia	Primordial germ cells that migrated into gonad
Leydig cells	Hormone producing (mesodermal epi.)
Follicular Cells	former sex cord cells
Paramesonephric Duct	(Mullerian Duct) formed from invagination at surface of intermediate mesoderm persisting only in female embryo. Forms Uterine Tube and Uterus paired paramesonephric ducts join and fuse to become uterus
Uterus	
Vagina	Distal 2/3 by endoderm, proximal 1/3 by paramesonephric ducts (int. mesoderm)
Seminal Vesicle	Bud off of mesonephric duct
Prostate Gland	From endoderm of UG sinus
Gubernaculum	Structure that pulls testis into scrotum
Tunica Vaginalis	Peritoneum that descends into scrotum and covers testis
Genital Tubercle	Forms Clitoris
Cloacal Folds	Form Urethral folds (->labia minora) and Anal Folds
Penis	Formed from phallus (genital tubercle) and urethra] folds
Scrotum	Formed from genital swellings
Labia Majora	Formed from unfused labioscrotal folds