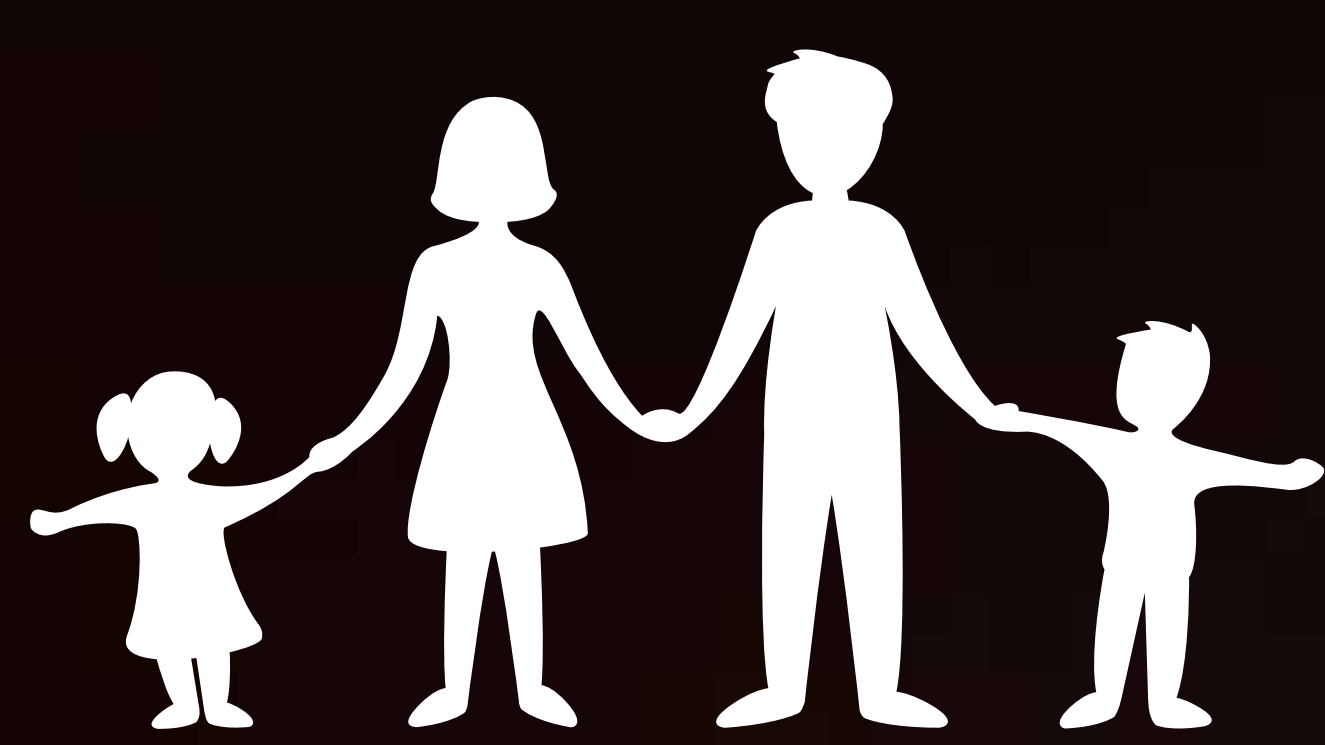




**ProVita
& Famiglia**

JUST HUMAN

THE MIRACLE OF LIFE
How a European citizen is born



THE AIM OF THIS EXHIBITION

This exhibition presents the **stages of human development from conception to birth**, as documented by contemporary embryology.

Each panel presents **verifiable data** - weeks of development, anatomical structures, sensory and motor capacities - drawn from standard embryology textbooks and peer-reviewed scientific literature.

Its aim is to offer Members of the European Parliament, officials and visitors a tool for scientific knowledge, at a time when the **European institutions** are actively debating family, natality and health policies: before any legislative position, it remains essential to know precisely the **biological facts those policies concern**.

It is from the very **origin of human life** - identical in status for every human being, regardless of sex, ethnicity, personal beliefs, origin or any other condition - that the principle of **equality** derives. A principle that **Article 2** of the Treaty on European Union places among the Union's founding values, and that **Articles 1** and **21** of the EU Charter of Fundamental Rights protect by affirming the **inviolability of human dignity** and prohibiting any discrimination based on sex, race, ethnic origin, personal beliefs or birth.

To know precisely the stages of human development is to recognise the common foundation on which the equal dignity of every person rests.

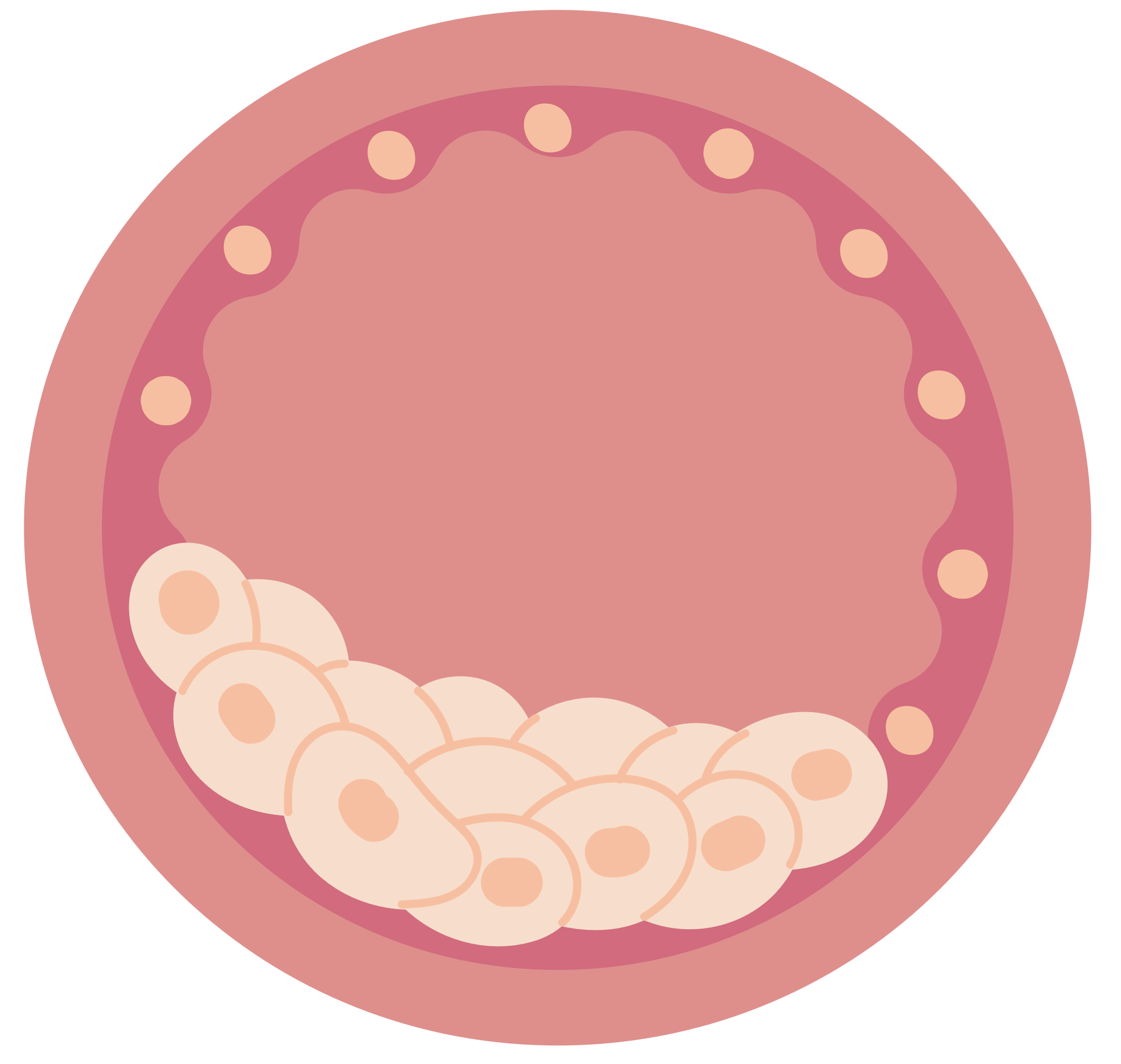
The exhibition is promoted by **MEP Paolo Inselvini** (ECR group) and curated by **Pro Vita & Famiglia**, Italian association - accredited in the EU Transparency Register - committed to promoting a culture that protects the **right to life and human dignity** through public and institutional awareness campaigns. For the production of the “Baby Oliver” video and for the representative images of fetal development reproduced on the panels, we thank the american association **Live Action**.



Methodological note on the week convention:
the weeks indicated on the panels are calculated **from fertilisation** (post-conception age), consistent with the embryology texts cited as primary sources. This age differs from that used in clinical practice (“gestational age”), calculated from the first day of the last menstrual period and about 2 weeks greater. When a datum comes from a clinical source expressed in gestational age, it has been converted and reported here as **“weeks from fertilisation”**, to ensure overall consistency.

Photo credits
https://en.wikipedia.org/wiki/Prenatal_development#/media/File:Embryo_at_7-8_weeks_from_conception.png // Baby Oliver, Live Action





DAYS 1–8/10

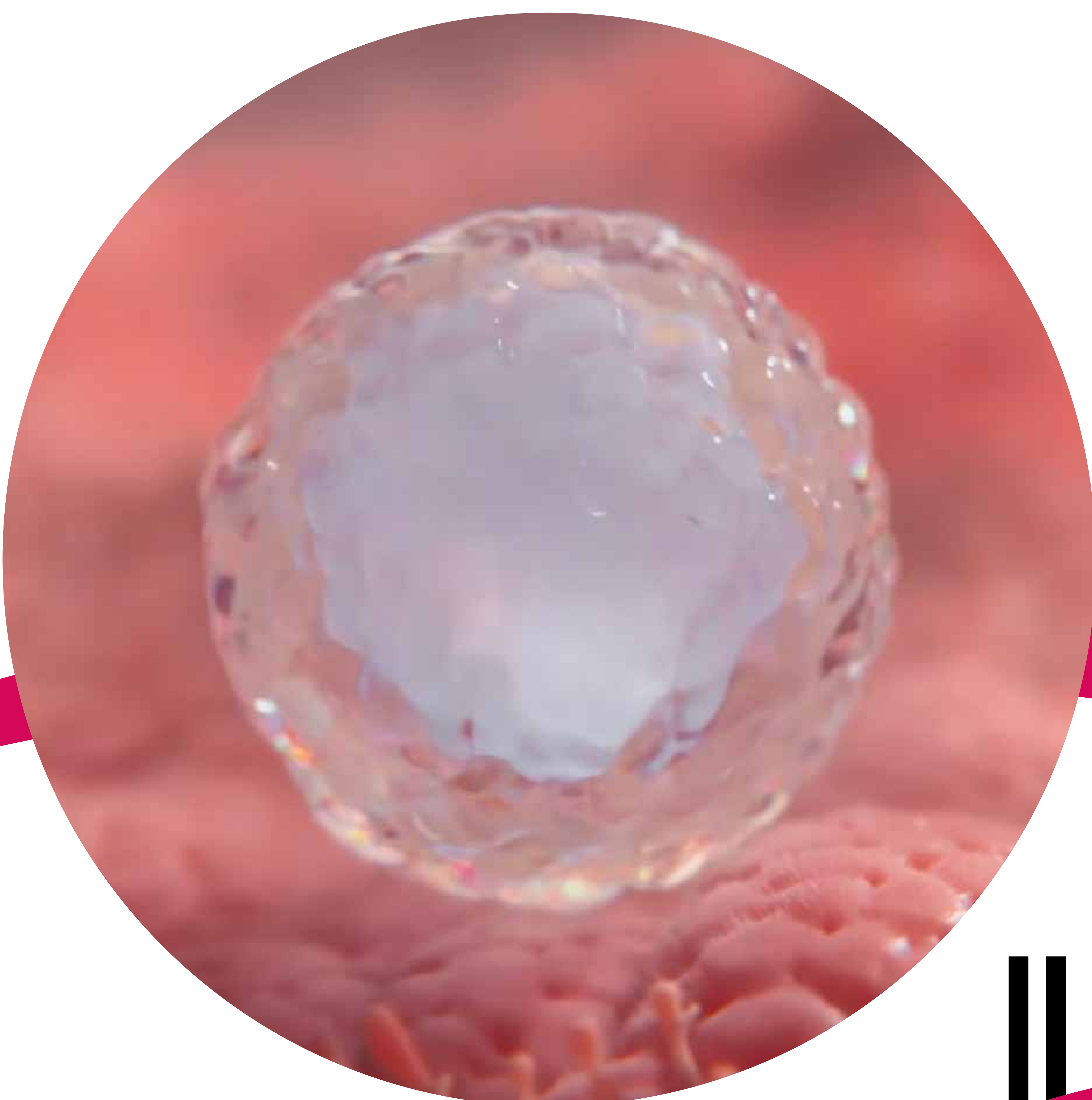
THE EMBRYO'S FIRST JOURNEY, IN A HIDDEN 'DIALOGUE' WITH THE MOTHER

The adventure of life begins at **conception**, when the father's sperm fertilises the mother's egg, generating the zygote - the first stage of a new, **unique and unrepeatable human being**. In the following days, the conceptus is guided from the fallopian tube to the uterus by cilia and tubal musculature, at a speed regulated by the ratio between maternal oestrogen and progesterone - a "control tower" that holds it in the isthmus until the right moment for release into the uterus. As implantation approaches, the conceptus sends targeted hormonal signals that enter into a **'dialogue' with the mother's body**: PIF promotes maternal immune tolerance, EPF is detectable in maternal blood within 48 hours of fertilisation, and PAF prepares the endometrium. Through HLA-G it induces the maternal immune cells to accept the 50% of the "foreign" paternal genetic heritage. The most recent genetic analyses show that the conceptus begins to decode and activate its own **DNA**, autonomously directing the early phases of its development, as early as the zygote stage - the single cell that follows fertilisation. From the very beginning, therefore, the embryo is already **"an active orchestrator of its own implantation and its own destiny"** (British Medical Journal, 2000).

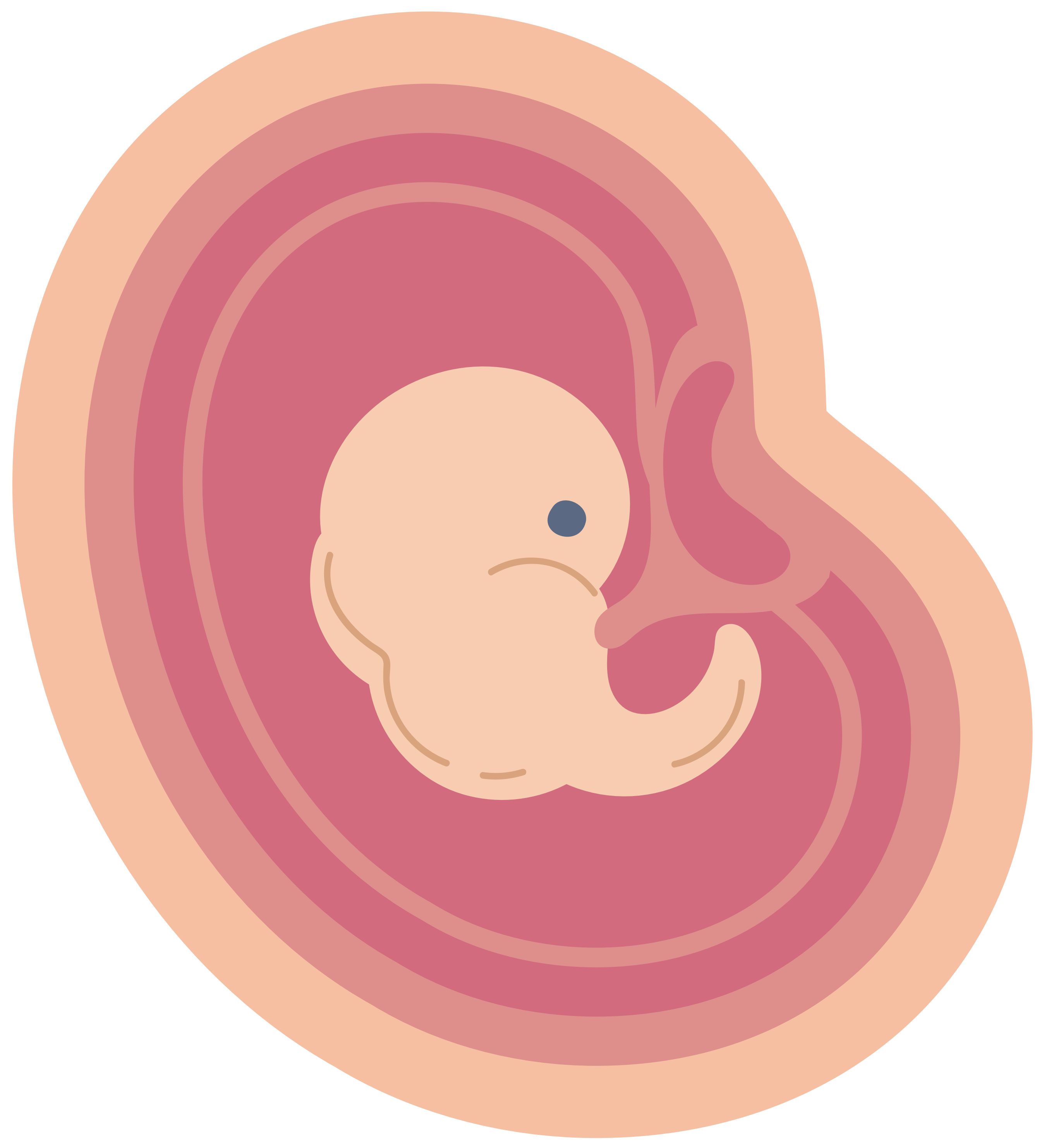
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MONTH 1

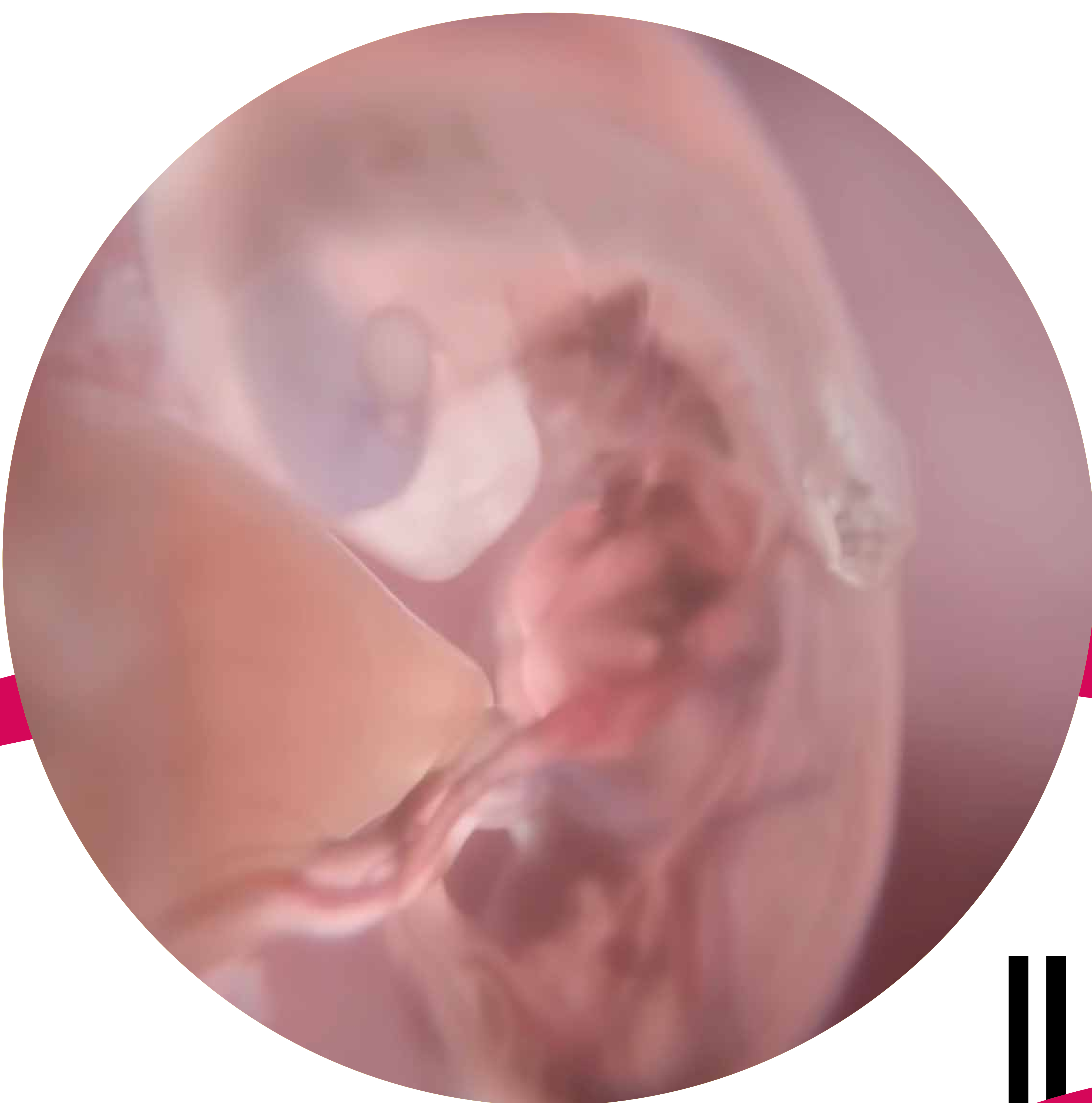
FROM A DISC OF A FEW CELLS TO A BODY WITH A BEATING HEART AND A FORMING BRAIN

Once implantation is complete, around days 9–10 after fertilisation, the outermost cells of the embryo (trophoblast) burrow into the uterine wall and begin to produce the hormone hCG, the **first chemical signal of pregnancy**. In week 2 (week 4 of gestation) the embryo is a bilaminar disc - epiblast and hypoblast - from which the amniotic cavity and the yolk sac form. In week 3 the primitive streak appears, establishing the **body axes**; epiblast cells migrate through it, giving rise to the three germ layers - ectoderm, mesoderm and endoderm - from which all tissues and organs will derive. The notochord induces the neural plate, while in the cardiogenic area the heart tubes begin to form. In week 4 the neural tube closes, the **brain** already differentiates into three primary vesicles (prosencephalon, mesencephalon and rhombencephalon), the **heart begins to beat** - at 16 days after fertilisation - and the embryo folds upon itself, taking on a cylindrical shape. By the end of week 4 the embryo already has about 28–30 pairs of somites, blocks of tissue that will give rise to the **vertebrae, muscles and skin** of the back: it is their number that allows embryologists to determine its age precisely.

SOURCES

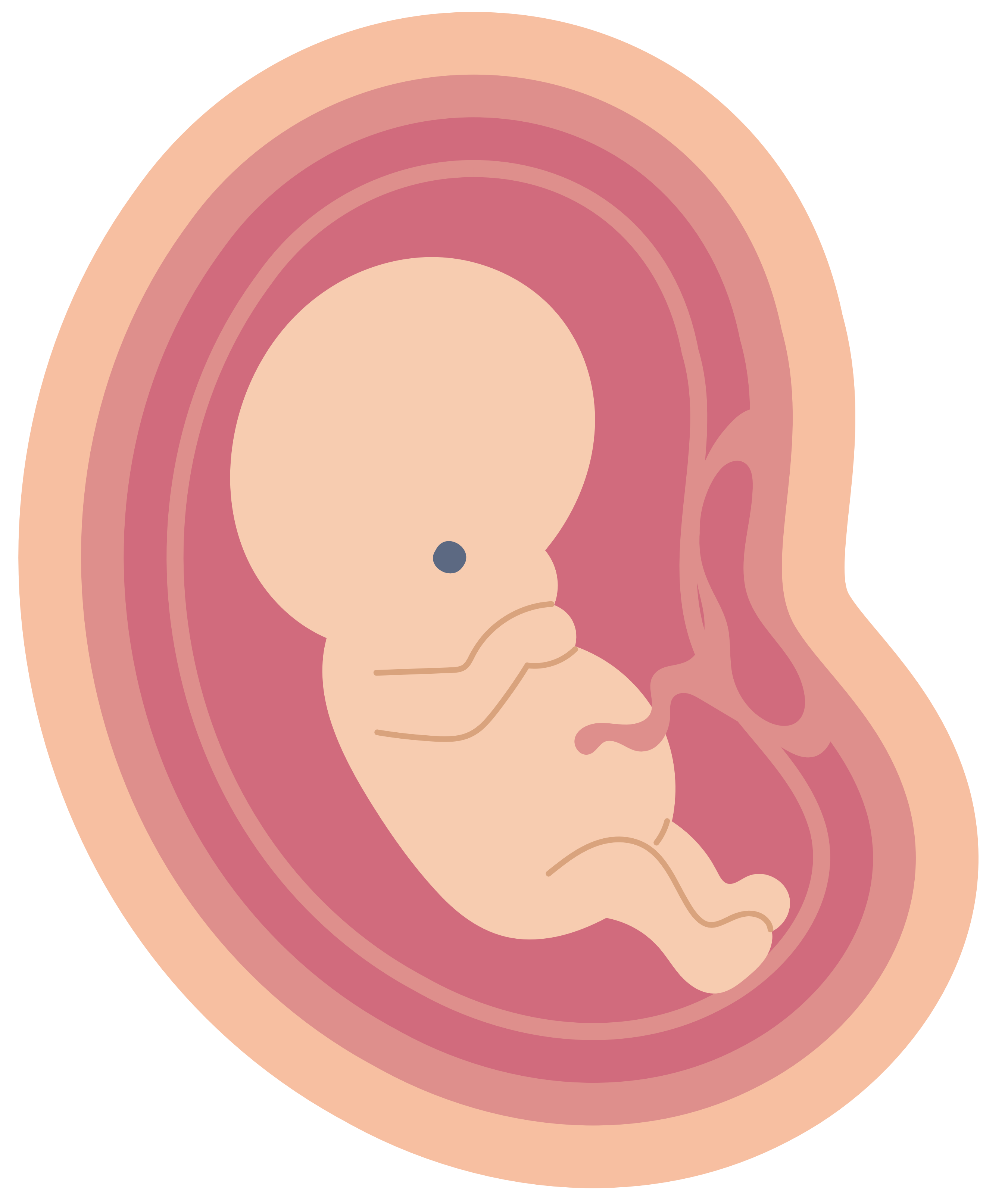


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MONTH 2



THE HEART CAN NOW BE DETECTED, AS THE FIRST SIGNS OF A FACE APPEAR

In week 5 after fertilisation (week 7 of gestation) the limb buds appear - upper limbs first, then lower - together with the **pharyngeal arches**, while the brain, already divided into three primary vesicles, further organises into five regions (telencephalon, diencephalon, mesencephalon, metencephalon and myelencephalon) and the heart completes its folding into distinct chambers. At week 6 the **heartbeat becomes detectable** by ultrasound (about 110 beats per minute) and the **face** begins to form from five tissue prominences. At week 7 the brain produces about **250,000 neurons** per minute, the right and left hemispheres become distinct, and the baby already responds to a light touch near the mouth. At week 8 it makes jerky, startle-like movements, while networks of neurons produce the first immature brain waves; the **eyes, nose, mouth and tongue are visible**, and the eyelids and salivary glands form. Amid the very rapid growth of this month, the baby's intestine temporarily grows outside the abdomen, within the umbilical cord, before returning completely into the body around week 10. The heart, meanwhile, will beat on average about **54 million times** between conception and birth.

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MONTH 3



AFTER MORE THAN 10 MILLION
HEARTBEATS, A TINY THUMB ALREADY
FINDS ITS WAY TO THE MOUTH

The embryonic period closes at the end of week 8 after fertilisation (week 10 of gestation): from this point on we officially speak of a **fetus**, which already possesses over 4,000 of the roughly 4,500 named anatomical structures of the adult body. By week 10 the heart has beaten more than **10 million times**, pumping on average 5.7 litres of blood per day; the fingerprints form, and the **fetus sucks its thumb**, already showing a hand preference - 85% prefer the right, the same proportion observed among right-handed adults. Fetal magnetic resonance imaging studies show that, at this stage, the cerebral cortex is still almost smooth: the first folds (sulci) will begin to appear only later. Between weeks 9 and 12 the external **genitalia**, until now identical in both sexes, begin to differentiate: in males the genital tubercle elongates to form the penis, in females it gives rise to the clitoris. As early as week 9 an ultrasound can begin to distinguish the sex, with an accuracy rising from 75% to nearly 100% over the following two weeks.

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FETAL PAIN

A SCIENTIFIC DEBATE WITH SERIOUS ETHICAL - AND POLITICAL - CONSEQUENCES

The development of the **fetal pain** pathways follows a documented sequence: the reflex response to touch appears around the mouth as early as 5–6 weeks after fertilisation (weeks 7–8 of gestation), then extends to the palms, the soles of the feet and the arms by weeks 8–9; the projections from the thalamus toward the cortical subplate are observable as early as weeks 8–10, while the centromedian nucleus of the thalamus begins to differentiate around week 10. The standard of care today recommends fetal analgesia in invasive procedures from as early as week 12.

For years the minimum threshold for pain perception was set at week 22, on the assumption that mature thalamocortical connections were required. More recent studies show that the thalamic projections reach the cortical subplate - a transient structure of the fetal brain - as early as **weeks 8–10**, and that these connections are functionally equivalent to the mature thalamocortical connections that will form only later.

Dr. Derbyshire himself - who in 2010 had co-signed the British report stating that fetal pain was impossible before 24 weeks of gestation - has publicly revised his position, acknowledging an “immediate and unreflective” **experience of pain** (that is, a neurological response to pain, not yet conscious awareness) **from as early as week 10**.

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MONTH 4

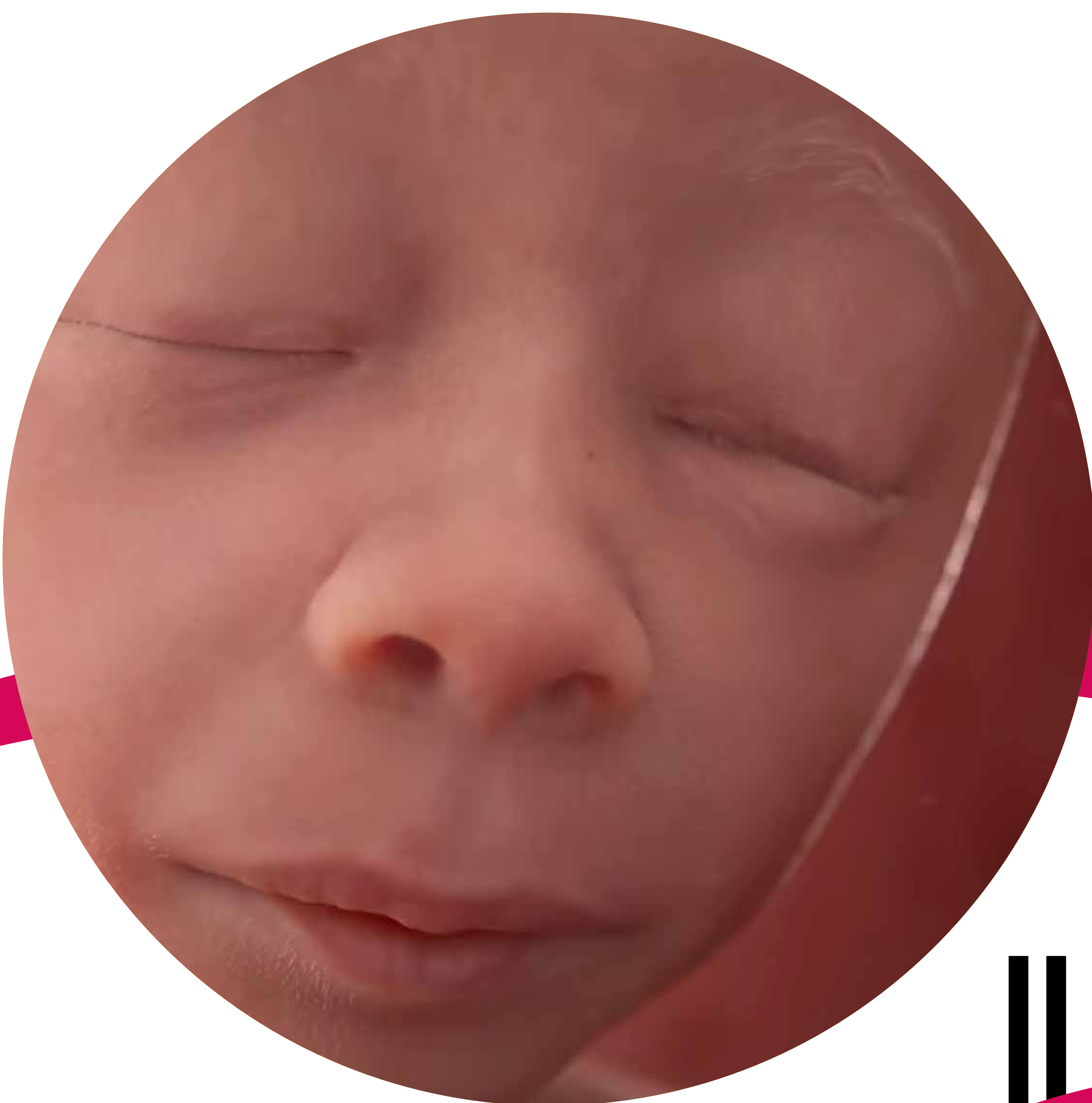
ULTRASOUND CAPTURES THE FIRST SMILE - WHILE THE BODY INCREASES ITS WEIGHT BY MORE THAN HALF IN A SINGLE WEEK

At week 13 after fertilisation (week 15 of gestation) the **fetus's first smiles** have been observed on ultrasound - not the only expression in its repertoire, which already includes grimaces, yawns and lip movements - and an X-ray at this stage would already reveal the entire skeleton. The heart, at 13 weeks, has already beaten about 15.8 million times, pumping about 24.6 litres of blood per day (an adult pumps about 5,680 litres per day). At week 14 the fetus begins to **grasp objects**, and between these two weeks its body weight increases by more than half in just seven days. At this stage the fetus also begins to swallow amniotic fluid - about 7 millilitres per day - a process that accompanies the production of urine, which began a few weeks earlier. **Females and males already move differently:** females open and close the mouth more often than males, a behavioural difference observable on ultrasound already at this stage, well before any evident physical differences appear.

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MONTH 5

THE MOTHER FEELS HER CHILD,
THE CHILD SENSES ITS MOTHER...
AND MORE

The mother begins to feel the first fetal movements (the “**quickening**”) between weeks 16 and 18 after fertilisation (weeks 18–20 of gestation). The fetus responds to an external sound for the first time at week 17. A kinematic study of fetuses followed at 12, 16 and 20 weeks showed that already by week 16 the movements of the hand toward the mouth and eyes begin to differentiate, taking on by the end of this month the characteristics of **intentional gestures**, planned according to their goal. Around week 20 the skin becomes covered with vernix caseosa, which protects it from abrupt movements, and with lanugo, a fine down that will remain with it almost until the end of the pregnancy. The quickening does not mark the beginning of fetal movement - which starts as early as weeks 7–8 - but the moment when movements become strong enough to be felt by the mother.

Survival outside the womb, though exceptional, is already possible in these weeks: a baby born at 20 weeks today has a 35% chance of survival with active care, compared with 5% in the early 2000s. Nash Keen, the most premature surviving baby in the world according to Guinness World Records, was born at exactly **19 weeks** after fertilisation.

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MONTH 6

YOU NEVER FORGET THE FIRST
STARTLE. THE CHANCES OF SURVIVING
OUTSIDE THE WOMB INCREASE

Around week 24 after fertilisation (week 26 of gestation), the **retina** develops the photoreceptors (cones and rods) that will make vision possible after birth, while in the lungs the first cells capable of producing surfactant appear - the substance that will keep the alveoli from collapsing in on themselves. The fetus also reacts to a loud noise with a **startle-and-blink response** (blink-startle) from weeks 22–23 - made possible by the separation of the eyelids, fused since week 8 and reopening precisely in these weeks - the same reaction observed in newborns and adults. Thanks to advances in neonatal medicine, the threshold of extrauterine survival keeps falling: between 2020 and 2022 a baby born at **22 weeks** had a 71% chance of survival with active care in a neonatal intensive care unit. The startle reflex described above is the same one observed throughout life, from newborns to adults: it is one of the most stable reflexes in the human motor repertoire, and its early appearance signals already-functioning connections between the ear, the spinal cord and the muscles.

SOURCES



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MONTH 7

MORE NEURONS THAN EVER! AND THE FIRST SIGNS OF RESPONSE TO LIGHT

At week 26 after fertilisation (week 28 of gestation) the fetus's brain contains the highest number of neurons it will ever have in its entire life - **over 100 billion**: from here on the brain will specialise mainly by strengthening existing connections, rather than producing new ones. In the same period, the **first cerebral responses to light** are recorded, measured directly within the mother's womb. Electroencephalogram studies further show that words or sounds repeated to the mother from week 27 are recognised by the baby's brain after birth - direct evidence that **prenatal auditory learning** leaves measurable traces in the nervous system. During this same period, the startle response to sound that appeared in the previous month becomes progressively more consistent. The pace of brain development in this month is such that, if weighed, the fetus's brain tissue would already be acquiring about one third of the weight it will have at birth - growth that will accelerate further in the following months.

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MONTH 8

40,000 CONNECTIONS PER SECOND: THE BRAIN LEARNS, THE BABY REMEMBERS

In the eighth month the brain rapidly develops new convolutions and grooves (gyri and sulci), increasing the cortical surface available for neurons, while the layered organisation of the cortex begins to resemble ever more closely the one it will have at birth. The connections between neurons (synapses) meanwhile form at an extremely intense rate - about **40,000 per second** - around week 32 after fertilisation (week 34 of gestation), one of the highest peaks of neural growth in all of life. In the same period, between weeks 28 and 30, the fetus already shows measurable **signs of learning**: the heart rate adapts to a repeated stimulus (habituation) and reacts again when the stimulus changes (dishabituation) - evidence that the nervous system not only perceives, but already learns and remembers. In the study that documented this capacity, the fetus was exposed to a repeated vibroacoustic stimulus until the heartbeat stopped reacting (habituation, a sign that the stimulus is now recognised as already known); then, when the stimulus was moved to a different point on the mother's abdomen, the reaction immediately reappeared (dishabituation) - proof that this is not mere fatigue of the reflex, but a genuine form of **short-term memory**.

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MONTH 9

THE FIRST CRY, SOOTHED BY A MOTHER IT ALREADY KNOWS WELL

A baby is considered full term from week 35 after fertilisation (week 37 of gestation); only 5% are born exactly on the due date, at week 38. In these very last weeks, at term, the fetus distinguishes its **mother's voice** from that of a stranger: the heartbeat accelerates at the former, slows at the latter. The lungs complete their coating of surfactant, which will keep the alveoli from collapsing at the **first breath**; at birth they are still half-filled with fluid, expelled thanks to a surge of catecholamines (stress hormones) 10–15 times higher than the maximum levels of adult stress. At birth, the newborn's heart pumps about 1,893 litres of blood per day. The newborn recognises its mother by **smell**, by the taste of her **milk**, by her **voice** and even by her **face** - capacities demonstrated by classic experiments in which newborns modify their sucking behaviour in order to hear the maternal voice rather than that of a stranger. Sight, by contrast, is still very limited: a newborn's visual acuity is about 20/640, one twentieth that of an adult.

**When it is born, the child has a full life ahead of it.
And a full life behind it.**

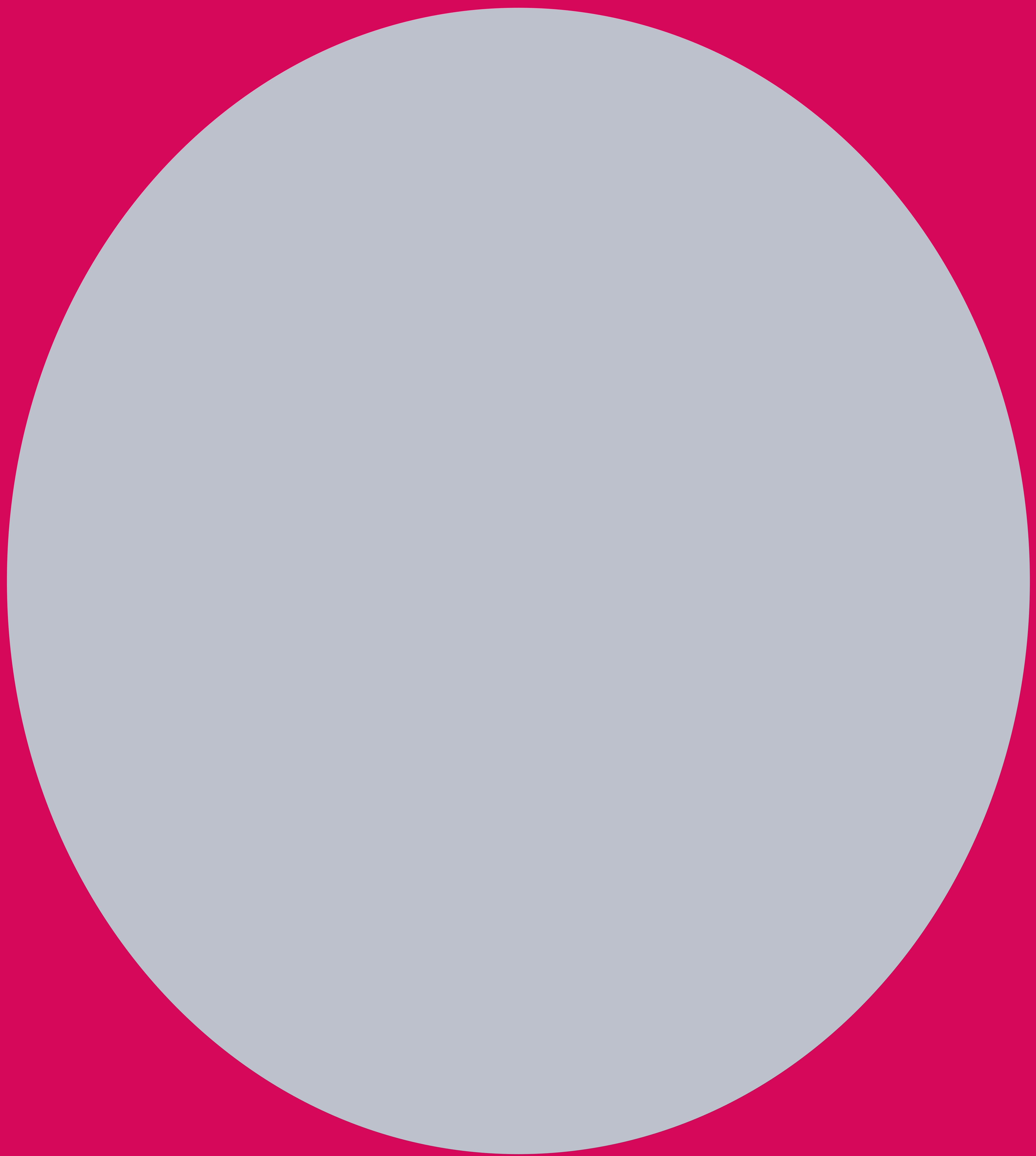
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THIS IS YOUR STORY

BE GRATEFUL!

What you have seen in these panels is not merely a sequence of scientific facts and data. **It is your story.** It is the account of the journey that you too, in the first person, had to make in order to be born, to grow and **to arrive here**, inside the European Parliament, working every day for the promotion of the dignity, rights, freedom and equality of every human being.

That journey is not foreign to this commitment: on the contrary, it is its foundation. **Rights** are born when people are born, and people are born when a new human organism - unique and unrepeatable in the history of humanity - comes into existence: **scientifically, the moment of conception.**

Before being a citizen, a voter, an official or a representative, each of us was, for nine months, exactly the human being you have met panel after panel. We hope this exhibition has left two things in your heart: **wonder** at the extraordinary complexity with which nature is wholly oriented toward promoting and protecting life from its very beginning, and **gratitude** for being part - you first of all - of this wondrous journey that all of us, without exception, have made.

Pro Vita & Famiglia APS

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