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human brain maturation continues to around 20 to 25 and even up to 30 years of age and beyond the precise regulation of gene expression is fundamental to neurodevelopment plasticity and cognitive function although several studies have profiled transcription in the developing human brain the brain is a complex organ that controls thought memory emotion touch motor skills vision breathing temperature hunger and every process that regulates our body together the brain and spinal cord that extends from it make up the central nervous system or cns what is the brain made of introduction human brain development follows sequential orchestrated cellular and molecular steps that are driven by genetic blueprints to build an organ for sophisticated higher level these emerging data strongly suggest that the human brain continues to develop in a unique way in utero until the end of gestation and that early termination of pregnancy disrupts that development with subsequent behavioral consequences to characterize the earliest stages of human brain development we performed single cell rna sequencing across regions of the developing human brain including the telencephalon this article on brain development provides a simplified version of the subject the process of brain development is much more complex and complicated than depicted particularly for humans familial and social environment has been increasingly implicated in the development of the human brain both structurally and functionally although the brain continues to develop and change into adulthood the first 8 years can build a foundation for future learning health and life success how well a brain develops depends on many factors in addition to genes such as proper nutrition starting in pregnancy exposure to toxins or infections the brainspan atlas is a foundational resource for studying transcriptional mechanisms involved in human brain development the brainspan atlas was developed by a consortium consisting of the allen institute for brain science yale university nenad sestan mark b gerstein the zilkha neurogenetic institute of the keck school of medicine of an atlas

of the developing human brain istock scientists released the first comprehensive 3 d atlas of gene expression in the developing human brain the resource will help reveal the early roots of brain based disorders such as autism and schizophrenia introduction the formation of the human brain from a microscopic tube of neuroepithelial cells to a complex structure of 170 billion cells of diverse types and numerous synaptic connections is a feat of coordinated cellular and molecular development two new studies of the developing human brain are helping researchers reconcile a long held debate over how the brain forms the research appears oct 6 in a special issue of nature highlighting studies that contribute to a cell census or parts list of the brain human brain development is a protracted process that begins in the third gestational week gw with the differentiation of the neural progenitor cells and extends at least through late adolescence arguably throughout the lifespan brain activity is made possible by the interconnections of neurons and their release of neurotransmitters in response to nerve impulses neurons connect to form neural pathways neural circuits and elaborate network systems the whole circuitry is driven by the process of neurotransmission inside our brains lives a myriad of cell types that support complex human thought from our ability to make memories and decisions to our capacity to smell taste move and communicate scientists do not yet fully understand how this critical cellular diversity arises as the brain grows and develops now researchers at harvard medical 1 8 summary brain development has a protracted time course in humans beginning in the third week post conception and extending to the third decade of life the brain develops in 7 well defined phases that overlap and are repeated over the course of development 6 the development and shaping of the brain the making of the human brain from the tip of a 3 millimeter neural tube is a marvel of biological engineering to arrive at the more than 100 billion neurons that are the normal complement of a newborn baby the brain must grow at the rate of about 250 000 nerve cells per minute on average in this article i summarize research on the postnatal neuroanatomical development of the human brain and findings on perceptual and cognitive development during infancy but there are some major trends in the construction and remodeling that take place rapid growth in the womb by the last trimester of pregnancy a fetus s brain undergoes major increases in size folding the first years brain volume doubles in the first year of life as connections between

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