ABSTRACT Identification of regional stem cells and progenitor cells remains one of the key challenges of the developmental biology, the solution of which will promote progress of regenerative medicine. Recently, a receptor of stem cells factor - CD117 (C-kit) - has been treated as one of the most successful and widely used marker of stem and progenitor cells. Objective of this study was to analyze the possible affinity of C-kitpositive cells of the pancreas to the pool of regional stem cells. The study was conducted using whole embryos and human fetal organs derived during the period of week 4 to 28 of gestation, and pancreas autopsy of 2 months children and adults up to 50 years old. Paraffin histological sections were immunohistochemically stained with antibodies to stem cell factor receptor C-kit, insulin, and glucagon. To identify the proinsulin mRNA, the hybridization reaction was conducted in situ. During human prenatal development, the earliest (starting from week 4 of gestation) and pronounced expression of C-kit was observed in the originating nervous system (spinal cord, dorsal root ganglia, and Schwann cells). Since week 5 of gestation these cells appeared in the mesenchyme of the dorsal mesentery, and then in the derivatives of splanchnic mesoderm of the digestive tube where they spread over the smooth muscle cells of the muscle membrane. Expression of Ckit in the endodermal epithelium of the stomach occurs from week 13.5, and week 8.5 of gestation in some cells of the pancreatic ducts. C-kit-positive cells formed islets in the pancreas and started synthesizing hormones, such as glucagon and insulin from 8.5 and 11.5 week of gestation, respectively. C-kit-positive islet cells, expressing both insulin and glucagon, were found both in prenatal and postnatal pancreas. The resulted findings and the analysis of C-kit expression during human prenatal development allow referring the receptor of stem cells factor to the markers of committed precursor cells, the expression of which coincides with the functional differentiation of precursor cells. In the human pancreas there is a common C-kit-positive progenitor cell of α- and β-cells of the islets of Langerhans, which remains in the organ after birth. Keywords: prenatal development, pancreas, progenitor cell, C-kit, islet cells, nervous system, intestinal tube.

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