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Potential sources for adult stem cells within the pancreas

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Stem/progenitor cells with the potential to differentiate into insulin producing cells in vitro and/or in vivo were described in pancreatic islets, pancreatic ducts, among the population of pancreatic acinar cells and within adult or fetal pancreas without further specification. In some instances progenitor cells in pancreatic ducts were thought to expand and differentiate into insulin producing cells in response to specific stimuli. Whereas in the case of acinar cells a de-differentiation appears to be the first step followed by re-differentiation into β-cells. The origin of the bona fide stem cell however remains somewhat elusive and a recent report questioned the entire concept of β-cell stem/progenitor cells with studies using genetic lineage tracing experiments. With this approach it has been shown that pre-existing β-cells rather than adult stem/progenitor cells retained a proliferative capacity and may thus represent the major source of new β--cells in adult life, at least in mice. In this study the authors almost excluded the possibility of stem or progenitor cells to play a role in β-cell replacement in adult life. This extreme position however may not be justified by the data, given the fact that the study was not designed to identify precursor cells per se but rather to provide evidence for or against their participation in β-cell regeneration. And, this study is in conflict with numerous recent in vivo and in vitro studies suggesting the existence of pancreatic stem/precursor cells. Today, it is not evident which of the concepts will pass the test of time.