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From cellular to chemical approach for acute neural and alternative options for age-induced functional diseases

Antonin Bukovsky

Abstract

Endogenous "stem cell niche" (SCN) accompanying vessels contains immune system components which *in vivo* determine differentiation of multi potent stem cells toward proper cell types in given tissue. Combinations of sex steroids may represent novel chemical approach for neuronal areas of regenerative medicine, since they cause transformation of vascular smooth muscle stem cells into differentiating neuronal cells. Circulating sex steroids are present during pregnancy and can be utilized where needed, when various embryonic/fetal tissues develop from their stem cells. Utilization of induced regeneration of tissues (regenerative medicine) is expected being more effective in sudden failures of younger individuals carrying intact SCN, as compared to established chronic disorders caused by SCN alteration. An essential component of SCN are monocyte-derived cells (MDC) exhibiting tissue-specific "stop effect" (SE) preventing, for instance, an aging of neuronal cells. Its alteration causes that implantation of neuronal stem cells will also result in their differentiation toward aging cells. When we repair the SE by supply of circulating mononuclear cells from young healthy individuals, we may be able to provide novel regenerative treatments of age-induced neural diseases by sex steroid combinations.

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