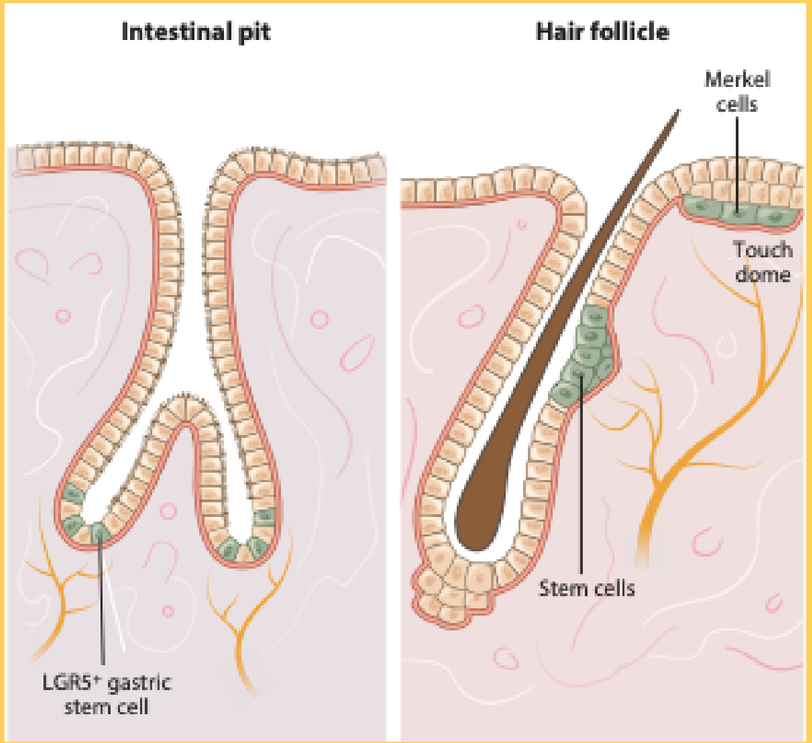
Cancer

Neural Regulation



Sai Naga Rishmitha Koppuravuri
1910110335
Shiv Nadar University

THE FAR REACH OF NERVES

- Nerves permeate the human body, branching and tapering extensively from a central trunk to form microscopic contacts within tissues.
- These many nerves are integrated together with the brain and spinal cord into a functioning nervous system, which is uniquely capable of executing diverse programs from cognition to movement.
- They also critically regulate stem cell niches throughout the body

GENETIC BASIS & NERVOUS SYSTEM

- The nervous system is an integral and understudied force capable of shaping the initiation and growth of a variety of cancers such as brain, gastric, pancreatic, prostate, and skin malignancies.
- These recent conceptual advances regarding the neural regulation of cancer build upon decades of research firmly establishing the fundamental importance of genetic abnormalities to cancer.
- The etiology of nearly all cancers can be attributed, at least in part, to the influence of tumor-suppressor gene and oncogene mutations or other genetic/epigenetic aberrations

NORMAL STEM CELL NICHES

- While each stem cell niche is unique in terms of form and function, one common motif is the presence of nerve terminals.
- Nerves actively participate in shaping stem cell niche development, homeostasis, plasticity, and regeneration throughout the body
- For many stem cell types, progrowth signals emanating from local nerve terminals are integral to maintenance of homeostatic stem cell population density. It now appears that this system of neural regulation is one of the first to be co-opted by incipient cancer cells on the journey to malignant transformation.

PERIPHERAL NERVES PLAY DIVERSE ROLES IN PROMOTING CANCER INITIATION, SPREAD, AND ASSOCIATED PAIN

WHAT IF???

Computational models of the feedback loop between the Central Nervous System and the Mapped tumour growth could help with regulation of doses of inhibitory coumpounds introduced to the system, determining points of entry, efficient means of introducing them.
This is the closest to a "cure" that some scientists think is possible