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By enhancing EGFR signaling, PRMT1-mediated H4R3me2a recruits SMARCA4 to promote colorectal cancer progression.

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Abstract: ((

Cancer progression is aided by abnormal changes in epigenetic pathways such as histone modifications. PRMT1, which causes asymmetric dimethylation of histone H4 on arginine 3 (H4R3me2a) and is required for cell proliferation, is increased in human colorectal cancer (CRC). However, it is unclear how this deregulated alteration may contribute to CRC malignant transitions. To investigate the potential genomic recognition pattern of H4R3me2s in CRC cells and its effect on CRC progression, we combined biochemical assays such as protein interaction studies and chromatin immunoprecipitation (ChIP), cellular analysis such as cell viability, proliferation, colony formation, and migration assays, clinical sample analysis, microarray experiments, and ChIP-Seq data. PRMT1 and SMARCA4, an ATPase subunit of the SWI/SNF chromatin remodeling complex, work together to promote colorectal cancer (CRC) progression, according to new research. SMARCA4 is discovered to be a novel PRMT1-mediated H4R3me2a effector molecule. We show that through boosting EGFR signaling, H4R3me2a directly recruited SMARCA4 to improve the proliferative, colony-forming, and migratory properties of CRC cells. We discovered that EGFR and TNS4 were key direct downstream transcriptional targets of PRMT1 and SMARCA4 in colon cells, and that they promoted CRC cell proliferation in a PRMT1 methyltransferase activity-dependent manner. In the C57BL/6 J-ApcMin/+ CRC mouse model, knocking down or inhibiting PRMT1 significantly slowed the development of CRC cells in vivo. Importantly, higher PRMT1 or SMARCA4 expression in CRC patients was linked to EGFR and TNS4 expression, and CRC patients had lower overall survival. These data imply that SMARCA4 is a novel essential epigenetic regulator of CRC advancement, revealing a vital interplay between epigenetic and transcriptional regulation during CRC growth. As a result, our data point to PRMT1/SMARCA4 inhibition as a possible CRC therapeutic intervention method. SMARCA4 is recruited by PRMT1-mediated H4R3me2a, which promotes colorectal cancer progression by increasing EGFR signaling.

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Biography: (200 Words)

Victoria Serrano is a dedicated and caring Doctor of Biotechnology with over a decade of experience in the field. General practice is a field to which I am dedicated. Is motivated to work as a proactive member of successful multidisciplinary teams with the goal of developing and improving medical practice standards via the application of medical education and technological advancements. A gifted and accomplished biotechnology leader who has made a direct contribution to the personal and professional development of medical students and trainees. Now seeking a challenging employment in medical/pharmaceutical biotechnology, in where I can put my existing talents and expertise to good use while also allowing for future personal and professional development.

About University: (200 Words)

The Institution of Cape Town (UCT) is a public research university in Cape Town, South Africa. It is located in the Western Cape Province.

The University of Cape Town (UCT) was established in 1829 as the South African College, making it the country's oldest higher education institution.Together with Stellenbosch University, which obtained full university status on the same day in 1918, it is the oldest university in South Africa and the oldest existent university in Sub-Saharan Africa. the QS World University Rankings, the Times Higher Education World University Rankings, and the Academic Ranking of World Universities, UCT is the highest-ranked African university, and it's Commerce, Law, and Medicine faculties are consistently ranked among the top hundred in the world. It is the only African member of the World Economic Forum's Global University Leaders Forum (GULF), which is made up of 26 of the world's finest universities. The Nobel Prize has been awarded to five UCT alumni, staff members, and researchers. 35 UCT staff members are A-rated NRF researchers as of March 2020 (representing 30% of the national total). 88 employees are members of the South African Academy of Sciences.

Importance of Research: (200 Words)

Colorectal cancer (CRC) is the world's third most frequent cancer and the fourth major cause of cancer-related deaths; by 2030, the global burden of CRC is anticipated to rise by 60% to more than 2.2 million new cases and 1.1 million cancer deaths. The accumulation of a range of genetic and epigenetic alterations in colon epithelial cells is one of the main processes driving the onset and progression of CRC. Major improvements in our understanding of cancer epigenetics have been made in the last decade, particularly in epigenetic alterations such as aberrant DNA methylation and changes in histone modification states.

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