Program Aims

Prior Aims	New Proposed Aims (2019)
Cancer Biology & Evolution	
1. Empirically & mathematically define the dynamics operational in cancer and therapy	1. Define networks operational in cancer development & progression
2. Exploit evolution by natural selection as the first principle operational in cancer	2. Develop animal & mathematical models of human cancer development & progression and therapeutic resistance
3. Translate evolutionary dynamics into personalized, modeled therapies	3. Translate basic discoveries into personalized, modeled therapies
Cancer Epidemiology	
1. Examine the association of inherited susceptibility biomarkers with cancer risk and outcome	1. Identify inherited susceptibility biomarkers of cancer risk, progression, and outcome and explore underlying mechanisms
2. Identify and test whether acquired biomarkers can predict cancer and outcome	2. Identify and validate acquired biomarkers predicting cancer risk, progression, and outcome and explore underlying mechanisms
3. Discover and test the efficacy of promising approaches for the prevention and early detection of cancer	3. Discover and test the efficacy of promising approaches and novel interventions to impact cancer across its continuum
Chemical Biology & Molecular Medicine	
1. Identify, validate, and characterize targets with therapeutic relevance in refractory and metastatic malignancies	1. Identify and validate pathways and targets of cancer and therapy resistance
2. Design small molecule chemical probes to modulate oncogenic targets and pathways	2. Characterize mechanisms of action and optimize existing drugs and lead compounds
3. Develop and implement mechanism-based therapeutic trials	3. Design and implement therapeutic trials with a precision medicine approach
Health Outcomes & Behavior	
1. Develop & promote **prevention & early detection** of cancer.	1. Develop and promote **prevention and early detection** of cancer.
2. Enhance **quality of life** of patients & family.	2. Enhance **quality of life** of patients and family.
3. Enhance **quality of cancer care**.	3. Advance cancer **health equity**.
4. Address cancer **health disparities**.	
	Thematic Area: Enhancing quality of cancer care (CCDR)
Immunology	
1. Advance and translate T-cell therapies for solid tumors and hematologic malignancies	1. To understand molecular and cellular mechanisms to exploit innate & adaptive immunity against cancer
2. Define molecular & cellular mechanisms to exploit innate & adaptive immunity against cancer	2. To elucidate & target pathways governing effectiveness, resistance & toxicity in anti-cancer immunotherapy
3. Prevent graft-versus-host disease (GVHD) while sparing graft-versus-leukemia responses after hematopoietic cell transplantation (HCT)	3. To develop &implement anti-cancer cellular therapies