

**NATIONAL RESEARCH FOUNDATION**  
PRIME MINISTER'S OFFICE  
SINGAPORE

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**List of Awarded CRP Projects**

S/N	Title	Principal Investigator	Host Institute
<b>CRP 1</b>			
1	Artificial Mesoscopic Structures for Next Generation Electronic and Photonic Technology	Zhang Dao Hua	NTU
2	Graphene related Materials and Devices	Loh Kian Ping	NUS
3	Lipidomics: Novel Tools and Applications	Markus Wenk	NUS
4	Multi-functional Spintronic Materials and Devices	Ding Jun	NUS
5	Molecular Engineering of Membrane Materials Research and Technology for Energy Development: Hydrogen, Natural Gas and Syngas	Neal Chung Tai-shung	NUS
<b>CRP2</b>			
6	Biodegradable Cardiovascular Implants	Freddy Boey	NTU
7	Towards Manufacturability of Carbon Nanotube-based Printed Electronics	Mary Chan	NTU
8	Theory and Practice of Coding and Cryptography	Ling San	NTU
9	Biologically-inspired Design, Nano-fabrication and Nano-lubrication of MEMS, NEMS and Micro-mechanical Devices	Sujeet Sinha	NUS
<b>CRP3</b>			
10	Autologous Cell Therapy for the Aging Heart Using Reprogrammed Cells	Winston Shim	National Heart Centre
<b>CRP4</b>			
11	Adult and Induced Pluripotent Stem cells for Neurological Disorders and CNS Repair	George Augustine	Duke-NUS Medical School
12	Membrane Protein Sciences – Tools for Rational Discovery of Novel Therapeutics and Diagnostic Targeting Integral Membrane Proteins	Jaume Torres	NTU
13	Nanonets: New Materials, Devices for Integrated Energy Harnessing & Storage	Subodh Mhaisalkar	NTU
14	Interface Science and Technology	Christos Panagopoulos	NTU
15	Tailoring Oxide Electronics by Atomic Control	Thirumalai Venkatesan	NUS
16	Frontiers in Magnetic Recording Research: Vision for 10 Terabits per square inch	Charanjit Bhatia	NUS
<b>CRP5</b>			
17	Underwater Infrastructure and Underwater City of the Future	Tan Soon Keat	NTU
18	Sustainable Urban Waste Management for 2020	Ng Wun Jern	NTU
19	Engineering Biology for Valuable Fuels	Matthew Chang	NTU
20	Toward Efficient Sunlight Harvesting	Zhao Yang	NTU

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S/N	Title	Principal Investigator	Host Institute
21	New Biotechnology for Processing Metropolitan Organic Wastes into Value-Added Products	He Jian Zhong	NUS
<b>CRP6</b>			
22	Advanced FO Membranes and Membrane Systems for Wastewater Treatment, Water Reuse and Seawater Desalination	Neal Chung Tai-shung	NUS
23	Excitonics Science and Technology toward Revolutionary Semiconductor Lighting: Ultra-Efficiency Excitonic Energy Transfer for Next-Generation Lighting and Displays	Hilmi Volkan Demir	NTU
24	Enabling Technologies for Large-scale Urban Subterranean Space Exploitation in Soft Soil Conditions	Lee Fook Hou	NUS
25	Enabling the Next Wave of Ultra Low Power Nano-systems: Heterogenous Integration of Low Power Electronics with High Performance Photonics	Yoon Soon Fatt	NTU
26	Novel 2D Materials with Tailored Properties: Beyond Graphene	Antonio Castro-Neto	NUS
<b>CRP7</b>			
27	AQMARINOME2016: Increasing Singapore's food fish production through aquaculture genomics R&D	Laszlo Orban	TLL
28	Rice for the future: Novel strategies to develop elite and improved varieties for sustainable rice production.	Prakash Kumar	NUS
29	Development of Virus-Controlling Biotechnologies for Cost-Efficient & Sustainable Aquaculture	Ge Ruowen	NUS
<b>CRP8</b>			
30	Self-Powered Body Sensor Network for Disease Management and Prevention Oriented Healthcare	Heng Chun Huat	NUS
31	Green factories for Essential Oil Production-Develop Plant System and Microbial Systems for the Sustainable Production of Valuable Chemicals from Plants	Ji Lianghui	TLL
32	New Generation Heating, Ventilation and Air Conditioning Systems - Total Energy Efficiency Solutions	Cai Wenjian	NTU
33	Redox Flow Lithium Batteries as a New Concept and Implementable Solution for Large Scale Energy Storage	Wang Qing	NUS
34	Herbalomic: Novel Approach for Fingerprinting and Authentication of Herbal Products	James Tam	NTU
35	Control of Exotic Quantum Phenomena at Strategic Interfaces and Surfaces for Novel Functionality by in-situ Synchrotron Radiation	Mark Breese	NUS
36	Plasmonic-Electronics: New Generation of Devices to Bypass Fundamental Limitations	Christian Nijhuis	NUS
37	Design and Development of a Comprehensive Information Technology Infrastructure for Data-Intensive Applications and Analysis	Ooi Beng Chin	NUS
<b>CRP9</b>			
38	Non-volatile Magnetic Logic and Memory Integrated Circuit Devices	Lew Wen Siang	NTU

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39	Toward Commercialization of Graphene Technologies	Barbaros Özyilmaz	NUS
40	Research and Development of Novel Interfacial Water Technologies	Paul Matsudaira	NUS
41	Artificial Liver Platform for Next-Generation Drug Discovery and Development	Cho Nam-joon	NTU
<b>CRP10</b>			
42	Learning from Bats: From Genomics to Controlling Viral Infection and Combating Cancer	Wang Linfa	Duke-NUS
43	Peripheral Nerve Protheses-Paradigm Shift in Restoring Dexterous Limb Function	Nitish Thakor	NUS
44	New Approach to Low Power Information Storage Electric-Field Controlled Magnetic Memories	Chen Jingsheng	NUS
45	Development of Super-resolution and High-sensitivity Optical Nanoscopes	Hong Minghui	NUS
46	Pure Spin Current and Spin Wave Devices	Adeyeye Adekunle	NUS
47	Rechargeable High Power Aqueous Lithium-Air Batteries	Stefan Adams	NUS
48	Controlling Cell-cell Signalling using Synthetic Biomimetic Interfaces	Virgile Viasnoff	NUS
<b>CRP11</b>			
49	Doped Contacts and Heterostructures for Solution-processable Plastic Electronics	Peter Ho	NUS
50	Towards the Reality of 3D Imaging and Display: Development of the World's First Viable Glasses-free Television System	Zheng Yuanjin	NTU
51	A Cutting-edge Silicon based Mid-IR Photonics Platform for Emerging Communications and Sensing Applications	Wang Hong	NTU
<b>CRP12</b>			
52	Next Generation SpinTorque Memories: from Fundamental Physics to applications	Yang Hyunsoo	NUS
53	Space Based Quantum Key Distribution	Alexander Ling	NUS
54	Hybrid Quantum Technologies	Christian Kurtsiefer	NUS
<b>CRP13</b>			
55	Optofluidic Nano-cytometer for Virus Purification, Sorting and Quantification as an Assistive Toolkit for Virus Diagnosis	Liu Aiqun	NTU
56	Next Generation High Performance Transparent conductors for flexible interactive touch devices	Lee Pooi See	NTU
57	Nanofluidics with Two-dimensional Materials	Slaven Garaj	NUS
58	Micro-fabricated Ring Carbon Nanotube Electron/ion sources	Anjam Khurseed	NUS
59	Fiber Medical Devices for Diagnosis of Coronary Artery Disease	Liu Linbo	NTU

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<b>CRP14</b>			
60	Development of Solvent Resistant Nanofiltration membranes for Sustainable Pharmaceutical and Petrochemical Manufacture	Neal Chung Tai-Shung	NUS
61	"QSYNC": Theory and Experiments of Quantum Synchronization in Trapped Ions and Nano-mechanical Resonators	Vlatko Vedral	NUS
62	Perovskite Optoelectronics: Multidimensional Perovskites for high performance solution-processed Light Emitting Devices	Subodh Mhaisalkar	NTU
63	Engineering of a Scalable Photonics Platform for quantum enabled technologies	Leonid Krivitsky	IMRE, A*STAR
<b>CRP15</b>			
64	Oxide Electronics Beyond Moore	Ariando	NUS
65	Piezoelectric Photonics Using CMOS Compatible AlN Technology for Enabling The Next Generation Photonics ICs and Nanosensors	Lee Chengkuo Vincent	NUS
66	Multi-level and High-fidelity Prints at the Nanoscale	Qiu Cheng Wei	NUS
67	Surgical PhotoAcoustic Nanotechnology (SPAN)	Liu Bin	NUS
<b>CRP16</b>			
68	High Performance Ceramic Materials and Components by Innovation One-step Forming-sintering Process	Ding Jun	NUS
69	Two-dimensional Covalent Organic Framework: Synthesis and Applications	Loh Kian Ping	NUS
70	Novel Integrated Agrotechnologies, Plant Nutrients and Microbials for Improved Production of Green Leafy Vegetables in Singapore	Sanjay Swarup	NUS
71	Imaging-enabled Development for 3D Microelectronics Nanofabrication	Utkur Mirsaidov	NUS
<b>CRP17</b>			
72	Green and Sustainable Pharmaceutical Manufacturing via Biocatalysis	Li Zhi	NUS
73	Engineering the Next Generation Ceramic Membranes for Water and Wastewater Treatment	John Wang	NUS
74	Understanding TERT Promoter Reactivation: Key for Making Cancer Cell Specific Telomerase Inhibitors	Vinay Tergaonkar	IMCB, A*STAR
75	Studying Zika Virus Pathogenesis and the Development of Therapeutics, In Vitro Cell Culture Model and Mouse Model that Display Various Diseases Phenotypes	Lok Shee Mei	Duke-NUS
76	Radiobiology Investigations into Cancer Therapy using High Energy Protons	Soo Khee Chee	NCCS
77	Combinatorial Strategies to Enhance Immunotherapy of Viral Associated Tumours	Antonio Bertolotti	Duke-NUS
78	Development of Mosquito-Borne Infectious Disease Diagnostic Devices with New Antibody	Ichiro Hirao	IBB, A*STAR
79	Integration of Electrically Driven Plasmonic Components in High Speed Electronics	Guo Yongxin	NUS

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<b>CRP18</b>			
80	Targeting Oxidative Phosphorylation for the Rational Development of Sterilizing Drug Combination for Drug-resistant Tuberculosis	Gerhard Grüber	NTU
81	Low Cost, Low Power, Multi-Wavelength WDM Sources Leveraging Highly Nonlinear Ultra-Silicon-Rich Nitride Devices	Dawn Tan	SUTD
82	Next Generation Broadband, Compact, Ultra-Sensitive, Real-Time, Tunable Laser Spectroscopy Analyzer	Wang Qijie	NTU
<b>CRP19</b>			
83	Germanium-Based Materials for Silicon-compatible Near-IR and Mid-IR Light Source	Tan Chuan Seng	NTU
84	Nanostructured Bactericidal Metal Oxides for Consumer Care and Self-Disinfecting Surface Applications	Zhang Yugen	ISCE2, A*STAR
85	Epitope Dynamics during Flaviviral Entry for Targeted Antibody Discovery	Thorsten Wohland	NUS
86	Singapore Initiative in Next Generation T-cell Decoding for Immunotherapy (SiTDecode)	Nicholas Gascoigne	NUS
87	An Integrative Approach to Build a Microbial Alkaloid Production Platform for Biotechnology	Ang Ee Lui	SIFBI, A*STAR
<b>CRP20</b>			
88	High-throughput Reprogramming of Regulatory Networks for Cell Conversions and Treating Complex Diseases	Owen Rackham	Duke-NUS
89	From Genes to Products: Study and Application of Insect Structural Colours for Biomimetic Manufacture	Antonia Monteiro	NUS
90	CogniVision – Energy-Autonomous Cognitive and Attentive Cameras for Distributed Real-time Vision with Milliwatt Power Consumption	Massimo Alioto	NUS
<b>CRP21</b>			
91	Integrated On-Chip Planar Coherent Light Sources	Sun Handong	NTU
92	Spin Orbit Coupling based Intelligence Technology (SOCIETY)	Piramanayagam	NTU
93	Towards On-Chip Topological Quantum Devices	Bent Weber	NTU
94	A Versatile Singapore-based Proprietary Transgenesis Platform for the Biopharmaceutical and Soft Commodity Sector	Peter Dröge	NTU
95	Deciphering the Molecular Pathogenesis of Enterovirus 71: Towards Effective Treatment Options to Fight Hand, Foot and Mouth Disease	Sylvie Alonso	NUS
96	Unlocking the Secrets of Microbially Influenced Corrosion: From Detection to Control Mechanisms	Federico Lauro	NTU
97	Human Umbilical Cord-Lining Derived Induced Pluripotent Stem Cells (CLiPS) as a Universal Source of Cells for Regenerative Therapy for Neurosensory Disorders	Lim Kah Leong	NTU



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98	Recovery and Microbial Synthesis of High-value Aquaculture Feed Additives from Food-processing Wastewater	Stefan Wuertz	NTU
<b>CRP22</b>			
99	Towards Carbon-Neutral Plastic Bio-Upcycling	Sierin Lim	NTU
100	Differentiating the Fine Reactivity Difference of Functional Saccharides	Robin Chi	NTU
101	Beyond MOORE – Negative Capacitance Field-effect Transistor for Ultra-low-power Electronics	Liu Zheng	NTU
102	The Next Generation of Spintronics with 2D Heterostructures	Gao Weibo	NTU
103	Deciphering the Mechanisms of RNA Modifications in Plants	Yu Hao	NUS
104	Geometric Interface Optics: A Synthetic Platform for High-capacity & Low-dimensional Metaphotonics	Qiu Cheng Wei	NUS
105	A Protein Biophysical Strategy for Discovering and Targeting Key Protein Nodes in Cancer	Tam Wai Leong	GIS, A*STAR
106	Large Area Synthesis and Applications of Atomically Thin Amorphous Materials	Barbaros Özyilmaz	NUS
<b>CRP23</b>			
107	Disruptive Fabrication Processes for Scalable Interconnects	Utkur Mirsaidov	NUS
108	Solution-Processed Perovskite Materials for Next-Generation Integrated X-Ray Sensors	Liu Xiaogang	NUS
109	PACE: Next-Generation IoT Edge Computing through Efficient Software Programmable Accelerators	Tulika Mitra	NUS
110	Integrating Magnetic Resonance Spectroscopy Imaging Modalities with Metabolic Drug Therapy for Cancer Precision Medicine	Han Weiping	IMCB, A*STAR
111	On-chip Terahertz Topological Photonics for 6G Communication (TERACOMM)	Ranjan Singh	NTU
112	Deeply Subwavelength Superoscillatory Imaging (DSSI)	Nikolay Zheludev	NTU
113	Active Topological Photonics towards Robust Lasers and Efficient Sensors	Zhang Baile	NTU
<b>CRP24</b>			
114	Developing hyperspectral OCT as a clinical test to detect neural dysfunction in degenerative diseases of the optic nerve and retina	Leopold Schmetterer	SERI
115	In-memory Computing based on Multiterminal Memtransistors for Cognitive Internet-of-Things (C-IoT)	Ang Kah Wee	NUS
116	Non-traditional Computing Enabled Through the Ising Model	Aaron James Danner	NUS
117	Enhancement of Regenerative Stem Cell Therapy with Extracellular Matrix Proteins and Novel Small Molecules	William Hwang	NCCS
118	Discovering New Target Space for the Development of Drugs against Malaria Parasites	Peter Rainer Preiser	NTU
119	Organic Thin-film Energy Sources for Highly Distributed Nanopower Generation	Peter Ho	NUS

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<b>CRP25</b>			
120	Reducing Diabetic Macrovascular Complications due to Peripheral Arterial Disease - REDUCE-PAD	Derek Hausenloy	Duke-NUS
121	On-Demand Synthesis of Pharmaceuticals in an End-to-End Fully Automated Fashion and Its Application to Accelerate Drug Discovery Process	Wu Jie	NUS
122	Perovskite Quantum Emitters (PQE)	Sum Tze Chien	NTU
123	Experimental Medicine Decipher of a Minimum Correlate of Cellular Immunity	Ooi Eng Eong	Duke-NUS
124	Memristive Halide Perovskites for Next Generation Embedded Neuromorphic Computing	Nripan Mathews	NTU
125	Development and Applications of Next-generation Transcriptome Imaging Technology	Chen Kok Hao	GIS A*STAR
<b>CRP26</b>			
126	Advanced Porous Materials and Membranes for Liquid-Phase Hydrocarbon Separations	Zhao Dan	NUS
127	Reinvigorating Natural Killer cells in the Immunosuppressive Tumor Microenvironment (RINK-TME)	Lam Kong Peng	SlgN, A*STAR
128	Identification of Structural and Functional roles of RNA in TNFR Signaling: Key for Designing Next Generation Drugs for Cancers and Immune Disorders	Vinay Tergaonkar	IMCB, A*STAR
129	Activatable Metabolic Glycoengineering in Cancer Cells for Bioorthogonal Targeted Cancer Therapy	Zhao Yanli	NTU
130	Targeting the Developmental Origins of Liver Disease and its Progression to Hepatocellular Carcinoma (HCC)	Dasgupta Ramanuj	GIS, A*STAR
131	Advanced Infrared Optoelectronics and Applications with Emerging Quantum Materials	Teng Jinghua	IMRE, A*STAR
132	A Green, High-throughput and Universal Solution for Spent Lithium-ion Battery Materials Recycling	Wang Qing	NUS
133	Engineered Bacteriophages for Hospital-acquired Antibiotic-resistant <i>Klebsiella pneumoniae</i> and <i>Staphylococcus aureus</i> Infections	Juan Pablo Bifani	NUS
<b>CRP27</b>			
134	Identifying Functional RNA Tertiary Structures in Dengue Virus	Yue Wan	GIS, A*STAR
135	Targeting Energy of Life for the Development of Drug Combination to Eradicate Antibiotic-tolerant Mycobacterium Abscessus, a Clinical Nightmare	Gerhard Grüber	NTU
136	Developing RNA Vaccines for Dengue Virus	Lok Shee Mei	Duke-NUS
137	Traversing Geodesics in Discovery-Development Space - from Novel Electrophotocatalysis to Sustainable and Scalable Manufacturing Processes	Shunsuke Chiba	NTU
138	Abiotic-Biotic Composites for Bioelectrosynthesis	Liu Bin	NUS
<b>CRP28</b>			
139	Development of Individualized Cancer Vaccines	Xiaoyuan Chen	NUS

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140	Targeting Novel Genes to Overcome Drug Resistance in EGFR-mutant Non-small Cell Lung Cancer (NSCLC)	Wanjin Hong	IMCB, A*STAR
141	Integrating Wideband Tuneable Acoustic Filters on Silicon for High-speed Wireless Communication	Huajun Liu	IMRE, A*STAR
<b>CRP29</b>			
142	Next-generation Geminal-atoms Catalysis as a Disruptive Technology for the Sustainable Fine Chemical Manufacturing	Lu Jiong	NUS
143	Transformative Nanotechnologies for Molecular Profiling of Extracellular Vesicles	Shao Huilin	NUS
144	Directed Energy Materials (DEM) for Advanced Manufacturing	Terry Steele	NTU
145	Harnessing Randomness and Chaos in Complex Disordered Photonic Systems	Wang Qijie	NTU
146	Spatial Multiome Cartography in Human Thymus to Guide NextGen Cell-based Therapies (SPECTRA)	Loh Yui Han	IMCB, A*STAR
<b>CRP30</b>			
147	Long-life Solid-state Batteries by Intelligent Composites with Active Interfaces	Stefan Adams	NUS
148	Achieving Coherence in Opto-Mechatronic Levitation Systems for Precision Quantum Sensing	Lam Ping Koy	IMRE, A*STAR
149	Miniaturizing Higher Dimensional Structured Light For Information Security	Joel Yang	SUTD
150	Phase-Separating Peptides as a General Platform for Intracellular Delivery of Antibody Therapeutics	Ali Miserez	NTU