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# FOREWORD

This book is more than an autobiography—it is a testament to how an unwavering pursuit of scientific ideals, grounded in conviction and passion, can lead to transformative breakthroughs in medicine.

I have known Professor Yung for nearly four decades, dating back to 1989 when he joined the Department of Pharmacology at Chang Gung Medical College, Taiwan—three years after I began my tenure in the Department of Microbiology and Immunology. At that time, we were fully engaged in establishing research laboratories while fulfilling our teaching responsibilities. Sharing a common interest in cancer research, we, together with three other colleagues, formed the Tumor Biology group.

In 2008, Professor Yung accepted a position at Hong Kong Polytechnic University where he continued to pursue his lifelong passion-the tumorigenic role of the nucleolar protein nucleophosmin 1 (NPM1/B23), a focus that originated during his Ph.D. training. His dedication eventually led to the founding of B.Y. Quantitative Medicine Limited, an innovative enterprise that can rightly be considered as his "third child."

The Chinese idiom " 牽一髮而動全身 "—"a single hair moved can set the whole body in motion"—perfectly captures the essence of NPM1/B23 within the cellular universe. Once considered as a mere nucleolar housekeeping protein, NPM1/B23 has emerged as a central hub orchestrating processes vital for cell survival, including proliferation, apoptosis, and genomic stability. Its diverse functions—spanning chaperone activity, nucleic acid binding, and ribosomal assembly—positions it as an essential integrator of molecular networks.



One of the major highlights of this book is the innovative Quantitative Gene Co-expression Test (QGCT®)—a system-level analytical approach that reveals pathway-level alterations centered on NPM1/B23 and beyond. By quantifying these changes at an individual patient level, QGCT® moves us close to the ultimate goal of precision medicine.

This book captures the remarkable journey of NPM1/B23—from a nucleolar housekeeping protein to a molecular pivot shaping cancer biology—and illustrates how quantitative, coexpression—driven analyses can unlock new avenues for targeted therapy. In moving this single molecular "hair," the entire cellular system shifts—a powerful reminder of life's interconnectedness at its most fundamental level. Beyond scientific discovery, Professor Yung's vision will inspire researchers, clinicians, and students alike, demonstrating how bold ideas, grounded in rigorous science, can revolutionize personalized care and recovery.

Yu-Sun Chang, Ph.D.
Professor Emeritus
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In 2014, during a visit to Hong Kong, I had the distinct honor of being introduced to Professor Yung through a mutual colleague. Later that year, he and his research team visited Houston, where I had the privilege of hosting them and arranging a tour of the MD Anderson Cancer Center. During this visit, Professor Yung delivered a compelling seminar titled "A Multidisciplinary Research on Cancer and Its Metabolic Risk Factor: From Computational Characterization, Functional Discovery to Clinical Diagnostics Development." His presentation was both intellectually rigorous and clinically insightful—an exemplary fusion of biochemical depth, computational sophistication, and translational relevance.

Now, more than a decade later, I am filled with admiration as I witness the culmination of Professor Yung's enduring commitment to cancer research in this seminal volume. This publication transcends conventional scientific discourse. It stands as a testament to the transformative power of integrative research—**serving as a beacon of hope for patients, a strategic guide for clinicians, and a source of inspiration for investigators navigating the complexities of cancer biology.**

Professor Yung's scholarly journey spans over four decades, beginning with foundational biochemical and genetic investigations into NPM1/B23—a multifunctional protein central to both physiological regulation and oncogenic processes. His research evolved to encompass computational analyses of NPM1/B23 co-expressed genes, illuminating regulatory aberrations and delineating gene co-expression networks. This progression—from molecular characterization to computational modeling—has yielded a novel framework for understanding and addressing cancer pathogenesis.



His dedication to the study of NPM1/B23 culminated in the development of QGCT®, a proprietary computational architecture designed to extract clinically actionable insights from transcriptomic data. QGCT® represents a significant advancement in precision oncology, empowering clinicians to identify and prioritize functionally critical pathways that may underlie therapeutic resistance, disease recurrence, or treatment failure. QGCT® also introduces a paradigm shift: conceptualizing cancer as a network-based disease amenable to intervention through targeted disruption of its critical systems. This innovative perspective on supportive oncology care marks a promising evolution in the pursuit of holistic, patient-centered treatment strategies.

From historical foundations to contemporary innovations, from data interpretation to clinical application—this book charts a visionary path toward a future in which cancer therapy is not only more effective, personalized, but also more compassionate. It is with the utmost respect and enthusiasm that I commend this important work to the scientific and medical communities.

Kwong-Kwok Wong, Ph.D.
Professor
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It is with great honor and deep affection that I write this foreword for my very good friend, Professor Benjamin Yat-Ming Yung, and his inspiring book *Beyond The Sunset: A Pathway-Driven Vision for Personalized Cancer Care and Recovery.*

Our friendship was forged during our years together at Chang Gung University, where I served as a professor in the Department of Microbiology and Immunology beginning in 1991, while Professor Yung held distinguished leadership roles as Director of the Institute of Natural Products, Dean for Research and Development, and Chair of the University and Hospital Research Review Committee. More than colleagues, we became trusted friends and true collaborators. Together, we discovered how nucleophosmin (NPM1/B23) helps tumor cells endure and survive under stress—a finding that not only united our scientific pursuits but also deepened the personal bond we shared.

What impressed me then, and still does today, is how Professor Yung unites keen scientific observation with creativity, faith, and humanity. This book reflects both his lifelong dedication to science and his vision for the future of cancer care. At its center lies NPM1/B23, the protein Professor Yung has studied for decades, and which he has shown to be a key modulator of tumor growth and survival.

Building on this foundation, Professor Yung introduces the Quantitative Gene Co-expression Test (QGCT®), a pioneering approach that views cancer not as a single genetic defect but as a complex, interconnected system of faulty pathways. By mapping these networks, QGCT® allows us to move beyond one-size-fits-all therapies toward a future where each patient's treatment can be guided by the unique circuitry of their disease. He further extends this vision into supportive care, showing how pathway-based supplements can complement clinical therapy and improve patients' quality of life.

In these pages, readers will find more than a record of scientific achievements. **They will discover a pathway-driven vision that reframes cancer treatment from fighting the disease to truly understanding it, and from uniform protocols to deeply personalized care.**

Professor Yung's life and work exemplify how rigorous science, creativity, and compassion can come together to serve humanity. This book is both a reflection of his remarkable journey and a guide to the future of cancer medicine. I am proud to call him my colleague and friend, and I wholeheartedly commend this book to readers around the world.

Sen-Yung Hsieh, M.D., Ph.D.
Professor
Chang Gung University College of Medicine
Chang Gung Memorial Hospital, Linkou Medical Center

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Cancer, a disease that has accompanied humanity for millennia, remains one of the most formidable challenges in medicine. From the "untreatable tumors" described in ancient Egyptian papyri to the era of twenty-first century precision medicine and immunotherapy, our understanding of cancer has deepened dramatically. Yet, the clinical limitations remain: drug resistance, recurrence, systemic metastasis, and the heavy toll of treatment continue to afflict countless patients and families.

The author of this book, Professor Benjamin Yat-Ming Yung, has distilled more than four decades of research, academic pursuit, and clinical insight into these pages. His scientific journey—from Southern Illinois University, Baylor College of Medicine, and Stanford University, to Chang Gung University, The Hong Kong Polytechnic University, and eventually the founding of B.Y. Quantitative Medicine—reflects the evolution of cancer research itself: from single-gene studies to genome-wide networks, from laboratory discoveries to clinical translation.

Within this work, readers will encounter a new paradigm—one that views cancer not as an isolated genetic accident, but as a system of dysregulated pathways. Central to this vision is the QGCT® model, a platform that applies gene co-expression analysis and artificial intelligence to construct a "pathway map" of each patient's cancer. This approach not only identifies hidden vulnerabilities but also opens the way for a new generation of personalized cancer care—treatments that are more precise, more comprehensive, and ultimately more attuned to long-term survival and quality of life.



More than a scientific treatise, however, this book also embodies the author's values and life experience: the inspiration of dedicated mentors, the pursuit of international collaboration, and the enduring love and support of family and faith. This integration of science, medicine, and humanity gives the work a universal resonance—one that speaks to physicians, researchers, patients, and general readers alike.

The road ahead in cancer treatment will no doubt remain complex and challenging. Yet, as this book demonstrates, it is only through interdisciplinary innovation, systemic approaches, and a patient-centered vision that we can truly move toward the revolution in cancer care.

May this work serve as a beacon of insight and inspiration on our collective journey to understand—and ultimately overcome—cancer.

Shin Ru Shih, Ph.D.
Professor
Director of Research Center for Emerging Viral Infections
Chang Gung University

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It is my great honor to write this book review for Professor Benjamin Yat-Ming Yung, whom I have known since my graduate studies and whose example has inspired my own scientific career. In this remarkable book, Professor Yung introduces the QGCT® model, a transformative paradigm that transcends the limitations of mutation-centric diagnostics by analyzing how the entire biological system has gone awry, focusing on the coordinated disruption of pathways rather than isolated genetic defects. This system-level approach fundamentally redefines how precision medicine can be approached in complex cancers and compellingly extends to the rational use of pathway-based supplements to support patient care.

From my perspective as both a scientist and someone who was impacted by Professor Yung's characteristics, **this book represents the culmination of decades of thoughtful research and genuine care for cancer patients. It offers hope grounded in rigorous science—exactly what our field and our patients need.** I wholeheartedly recommend it to clinicians, researchers, and especially to patients eager to understand the next frontier in cancer medicine. It will not only deepen your understanding of cancer biology but, more importantly, fundamentally reframes how we might finally conquer this complex disease.

Jason Lih, Ph.D.
Vice President, Research and Development, Apeximmune Therapeutics
Former Associate Director, Molecular Characterization Laboratory
Federic National Laboratory for Cancer Research/NCI



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I have known Professor Yat-Ming Yung for over twenty years, and we began a close working partnership while elevating the research and development environment at Chang Gung University. In this book, Professor Yung addresses a dilemma in precision oncology: for the majority of cancer patients, tumors exhibit multiple mutations, which limits the effectiveness of single-drug therapies and leads to inevitable drug resistance. Drawing upon his years of experience studying the nucleolar protein NPM1/B23, he proposes that the target for effective therapy should be the NPM1/B23-centric "pathway" of drug resistance and recurrence, rather than individual genes or proteins. **This book will not only refresh your understanding of cancer treatment but also show you how a true scholar devotes his life to interpreting the meaning of "bring glory to God and benefit humanity."**

Jau-Song Yu, Ph.D.
Professor
Department of Biochemistry and Molecular Biology
Chang Gung University

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In an era of rapid technological advancement, perhaps issues like human illness is the worthiest for us to reflect on. If life is real and precious, how can we maximize the power of scientific research to alleviate human suffering, enhance collective well-being, and truly promote civilization? **This book reflects Professor Yung's sincere insights and hopes, written with love and respect for life.**

Professor Yung is an outstanding scientist. Educated by renowned teachers, he excels not only in his profession but also in his vision and perspective. He is a meticulous thinker with extensive knowledge, always able to see opportunities in subtle details. He is also diligent and down to earth, never complacent about past achievements, but always striving for excellence and reaching new heights. Consequently, his 40 years of consistent hard work have yielded fruitful results, earning him high acclaim in the academic community.

Thank you, Professor Yung, for sharing his 40 years of research on cancer treatment with the public through this book. It's often said that science is the path to truth, while faith is the journey to find meaning. This book is a milestone in science, it is also a testimony of faith, embodying his love for God and humanity through research.

May readers find intellectual fulfillment and spiritual connection in this book, and may it become a blessing to their friends and family.

Rev. Wesley Hu
President of International Chinese Biblical Seminary in Europe (ICBSIE)



# PREFACE

I come from modest beginnings, having begun my academic journey at Southern Illinois University in the United States. There, I was fortunate to encounter a few professors who were remarkably passionate, rigorous, and deeply committed to their students. Their dedication left a lasting impact on me and sowed the seed of a lifelong aspiration: **to become an educator capable of inspiring others.**

This path led me to Baylor College of Medicine for doctoral studies in pharmacology under **Professor Harris Busch**, a world-renowned expert in cancer biology and nucleolar research. Training alongside medical students, I gained an invaluable foundation in translational biomedical research, integrating basic science with clinical insight. My work there resulted in the publication of three landmark papers and, crucially, a recommendation to pursue postdoctoral training with **Nobel Laureate Arthur Kornberg at Stanford University**. That opportunity was transformative, shaping the very core of my scientific approach.

Three years later, I began my career at the newly established Chang Gung University College of Medicine in Taiwan, where I could continue my research in biochemistry and cancer pharmacology while contributing to the development of the school.

Over the next 19 years at Chang Gung, I was promoted to full professor and took on several leadership roles, including Director of the Institute of Natural Products, Dean for Research and Development, and Chair of the University and Hospital Research Review Committee. I led efforts to establish Chang Gung's first generation of cross-disciplinary research centers in genomics, proteomics,

animal studies, bioinformatics and medical imaging, bridging academic research with clinical practice.

In 2008, I was appointed as Chair Professor of Biomedical Sciences at The Hong Kong Polytechnic University, further expanding my international research collaborations.

Upon retiring from academia in 2021, I founded **B.Y. Quantitative Medicine Limited**, a research company dedicated to harnessing large-scale molecular data to understand the complex gene interactions within cancer cells. Our work has recently culminated in a breakthrough—**the world's first pathway network model of cancer drug resistance and recurrence, centered on the nucleolar protein NPM1/B23**, a protein I have studied for over forty years. This model provides a new framework for clinicians to select optimal targeted therapies, aiming to overcome resistance, reduce side effects, and improve long-term survival. It represents a pivotal shift from merely fighting cancer to understanding and precisely regulating it.

This book distills a lifetime of dedicated research and these latest discoveries. It is written with the hope of shedding new light on cancer treatment for medical professionals and inquisitive readers alike.

I dedicate this book to:

1. The many teachers and professors who guided me throughout my journey—especially those who believed in me early on and inspired me to become a lifelong learner and educator.

2. My research assistants, graduate students, postdoctoral fellows, and the dedicated faculty colleagues at Chang Gung University and Chang Gung Memorial Hospital—especially those who joined me in establishing our cross-disciplinary research centers.

3. My beloved wife, Chris (Ng Man-Ying), who has walked beside me all these years. Though not a scientist herself, she has always listened patiently to my research stories. Her love, support, and unwavering companionship have been the foundation of my academic and personal life.



**May this book bring glory to God and benefit humanity—contributing to a future where science not only answers the needs of patients but also speaks to the deepest hopes of the human heart.**

Benjamin Yat Ming Yung, Ph.D.
Founder, Chairman, and CEO
B.Y. Quantitative Medicine Limited