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Journal of Controlled Release

journal homepage: www.elsevier.com/locate/jconrelPreface Special Issue (Sung Wan Kim memorial, *Journal of Controlled Release*)

This unique Special Issue in the *Journal of Controlled Release* celebrates the life and work of Professor Sung Wan Kim, and his productive, creative life-long career in the Departments of Pharmaceutics and Pharmaceutical Chemistry, College of Pharmacy, and Biomedical Engineering, College of Engineering, at the University of Utah, on the occasion of the first anniversary of his unfortunate passing in 2020. Formally trained as a physical chemist with a Utah doctorate in 1969 in gas-phase bimolecular reaction kinetic rate theory modeling, the newly minted Dr. Kim moved rapidly away from his core expertise and into the developing area of polymeric biomaterials. This notable decision occurred at a fortuitous time within the established, fertile Utah biomaterials research forum, with notable names, pioneering biomedical efforts and breakthrough concepts circulating in his community. He recognized this amazing and timely opportunity, pursued it and never let go. Nonetheless, the magnitude of Kim's proposed intellectual and research transformation to begin his independent career indicates his risk tolerance, bold confidence, and scientific comfort in indulging new, unsolved challenges and compatibility phenomena of polymer interfaces with blood. This Kim early career history is detailed in the Special Issue contribution from long-time Kim colleague, collaborator and friend, J. M. Anderson.

Dr. Kim eventually broadened his repertoire of polymeric biomaterials to novel drug delivery systems comprising diverse designs and capabilities. Many of his original polymer drug delivery themes involving new hydrogels, biodegradable drug conjugates, self-regulating drug delivery, and stimuli sensitive polymers are also appropriately represented in this special issue, some notably by the original pioneers in these important areas. Throughout his career, Kim was highly influenced by many notable polymer chemists and medical engineers, as well as medical therapeutic specialists in pursuing creative new ideas. Kim's scientific achievements in biomaterials and drug delivery systems consistently embody and integrate his versatile and masterful understanding of physico-chemical, polymer synthetic, and biological engagement principles. This mastery allowed him to navigate successfully between biomaterials designs, biological responses, disease states, delivery mechanisms and therapeutic outcomes to produce creative concepts year after year for over a half century. Kim trained his students and postdocs to think in similar ways: apply creative confidence to rapidly move into emerging scientific areas, adapting synthetic concepts from chemistry, therapeutic concepts from medicine, device and formulation concepts from bioengineering and pharmaceutics. Kim's demonstrated talent to produce novelty and impact from his unique ability to recognize and synthesize research elements from distant, unrelated areas characterizes much of his impressive career.

Dr. Kim eventually teamed up with colleagues Jorge Heller (USA)

and Jan Feijen (The Netherlands and Special Issue contributor describing the colorful, productive international Triangle Research relationship) to promote polymeric drug delivery in the early 1980's. Collectively, they concluded that Heller and Feijen start the *Journal of Controlled Release* with a new logo designed at Kim's office. In parallel, Kim organized the inaugural biannual international symposium on polymeric drug delivery systems with Utah colleague, J. Kopecek, that would eventually become synonymous with Utah pharmaceuticals, and bring the new *Journal of Controlled Release* early and critical visibility as the primary venue for the field. This strategic pairing proved very successful for ensuing decades, involving most if not all of the major contributors to the rapidly developing field of polymeric drug delivery systems, and establishing the flagship journal in its current field-leading prominence.

With his international heritage and immigrant American status, Sung Wan Kim was also a unique American liaison to the global biomaterials community. His focus naturally extended back to his native Korea, but also found solid footing in Europe, Japan, and early, in the former Soviet Union (now Russia). He tirelessly encouraged scientists in Asia and Europe to pursue new research on biomaterials and drug delivery to solve compelling medical problems. Kim consistently found creative ways to host international guests in his Utah labs, often using his personal funds. This dedicated passion and messaging led to Sung Wan's life-long network of friends and colleagues, both in academia and industry, and connected many younger scientists who have been impacted by his vision, priorities and science. One example is the number of former students, post-docs and visiting scholars from his research group contributing to this special issue. Nearly 4 decades of the Triangle research program catalyzed lasting relationships between young scientists trained cross-culturally in interdisciplinary drug delivery. Three of this Special Issue editorial team and several issue contributors benefited from participating in the global research program.

The Special Issue guest editors truly appreciate the diversity and variety of topical contributions from all authors across three continents in representing the work and creative drive of Sung Wan Kim in tribute. Certain elements of the Special Issue highlight specific and enduring research areas that characterize Dr. Kim's diverse academic career and products of involvement in his international Triangle research exchange program: non-thrombogenic surfaces, mass transport in hydrogels, thermosensitive polymers and thermo-gelling systems, polymeric gene vectors, polymer/virus hybrid delivery, and others. An additional creative benefit is the evident scientific richness in Issue topics contributed from those influenced by how Sung Wan educated and encouraged younger generations with drug delivery and biomaterials ideas and philosophy. The brashness, confidence and success that typified younger

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Kim's incongruous early departure from gas-phase kinetics to seemingly unrelated blood-materials interactions lives on in the generations of his versatile trainees who create and explore new research areas with similar boldness.

Kim's dedicated efforts profoundly influenced the early directions of polymer drug delivery to bring the field forward. His accomplishments produced 130 students and postdocs, a dizzying array of global recognitions, >500 publications and 38 patents, two US National Academy titles, numerous research awards, a huge family of close friends and academic descendants who remain active in North America, Asia and Europe, and endless memories, anecdotes and entertaining stories often shared in the community. Kim directly or indirectly touched the lives of so many around the world, and strongly influenced many of those connected to him to pursue his passions, visions and aspirations to improve the world.

Our initial planning had envisioned this Special Issue planning, timing and publication in tandem with a Kim memorial symposium appropriately to continue Utah's leading tradition in "recent advances in polymer drug delivery systems". Our full intentions sought to issue this JCR tribute volume just prior to this commemorative symposium, unlike

other JCR symposia Special Issues that publish sometime later after each event. With this anticipated coordination and timing, all symposium participants would have had accessibility to a Special Issue electronic version while attending the planned symposium. However, the current unprecedented global pandemic now isolates the initial symposium plan from the Special Issue. Given the inability to predict when the desired in-person Kim tribute symposium might occur to celebrate with this Special Issue, we proudly invite you to enjoy these rich contents from Asia, Europe and North America experts with the spirit of accomplishment and energy of discovery that Sung Wan Kim would have expected.

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