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Preface

Since the isolation and structure elucidation of the diterpenoid alcohol taxol by Wani, McPhail and coworkers in 1971, the unusual tetracylic structure of this unique natural product has aroused considerable interest in the synthetic community. However, the remarkable potential of taxol in recent clinical trials for the treatment of breast and ovarian cancer, coupled with the difficulty in obtaining the requisite quantities of taxol from natural sources for further clincial trials, has stimulated a dramatic intensification of the efforts in laboratories around the world to devise alternative sources for this very exciting drug. Biosynthetic, cell culture, botanical, as well as semi-synthetic and total synthesis approaches to taxol are under active investigation.

This very timely Symposium-in-Print is devoted to current efforts at total and semi-synthetic approaches to taxol. To date, over thirty groups have made impressive contributions to the ever-growing literature on taxol synthesis. The contributors to this Symposium-in-Print provide an excellent representation of that larger group, both geographically (representing three continents) and scientifically: Dr. Guerritte-Voegelein and coworkers (Institut de Chimie des Substances Naturelles, CNRS) report an unusual rearrangement of a baccatin that could lead to new taxol analogs. Professor Kuwajima (Tokyo Institute of Technology) describes an efficient method for the cyclization to form the eight-membered B-ring of taxol in an AC→ABC approach to the synthesis of taxanes. Professor Ojima (State University of New York at Stony Brook) reports an efficient approach to taxol semi-synthesis based on the β-lactam method, pioneered by Ojima and Holton. Professor Shea (University of California at Irvine) reports the atropselective synthesis and subsequent reactivity of the taxane ring system prepared via intramolecular Diels-Alder reaction. Professor Wender (Stanford University) describes a photochemical approach to the synthesis of the D-ring oxetane of taxol, an approach that was disclosed independently by Holton at the recent Taxol Symposium at the American Chemical Society Meeting in San Francisco earlier this year. Professor Blechert (Technische Universitat Berlin) and my research group at the University of Pennsylvania describe the application of photocycloaddition methodology to the synthesis of saturated tricyclic taxane analogs.

This structurally challenging and medically exciting compound has brought to the forefront the synergism that exists between chemistry and medicine. The scarcity of taxol and the clear need for a reliable supply have stimulated the creativity and imaginations of organic chemists around the world. New synthetic methodology and novel approaches to the construction of complex, highly oxygenated products will certainly continue to result from these ongoing efforts.

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