Doctor of Science honoris causa

Professor Shang Fa YANG

Citation

Have you ever heard of "The Yang Cycle"? No, it is not a new kind of bicycle developed in China. It refers to Professor Shang Fa YANG's discovery of the pathway of ethylene biosynthesis, a pathway that sheds light on our understanding of plant development and growth. This scientific understanding is of practical importance for the harvesting and storage of crops. Professor Yang, whom we honor today, is a leading international authority in the field of plant biochemistry and physiology. His outstanding research activities have been focused on understanding the biochemistry and physiology of ethylene, an essential gaseous plant hormone of immense importance to agriculture.

One might say that the distinguished mark of Professor Yang's academic career is that of the joy of scientific discoveries. He has devoted almost his entire research career to the central problem of ethylene biosynthesis and made a remarkable series of studies on the synthesis pathway. In the early phase of his work, he conducted elegant experiments that proved unequivocally the role of methionine as a precursor for ethylene biosynthesis in plants. He then established that SAM was an important intermediate in the pathway of methionine to ethylene. A major breakthrough came in 1979 when he discovered the key intermediate, ACC, between SAM and ethylene. The identification of ACC led to the isolation of an enzyme that is involved in the pathway now referred to as "The Yang Cycle".

Professor Yang's discoveries not only have elucidated the role ethylene plays in plant growth, development, senescence, and environmental stresses, but also have significantly contributed to economic benefits for agriculture. The applications of his research in post-harvest biology have had a significant impact on our understanding on how vegetables, fruits and flowers deteriorate in storage. A theoretical foundation is provided for the control of the deterioration process through biotechnology. By regulating ethylene biosynthesis, the life span and quality of harvested vegetables and fruits can now be prolonged. We have him to thank for apples and tomatoes staying fresh longer. Surely his accomplishments are an inspiration to HKUST students to embark on the journey of scientific research, a journey with the reward of the joy of discovery awaiting you. To savor a little of that joy, read the series of books he recently co-edited with our Professor S D Kung, entitled *Discoveries in Plant Biology*.

榮譽理學博士

楊祥發教授

的讚辭

你聽說過"楊氏反應途徑"(The Yang Cycle)嗎？不要誤會，它不是新款中國單車，而是楊祥發教授發現的乙烯生物合成的途徑；這個途徑有助於我們理解植物的生長和發育。這項科學發現對於農作物的收成和儲存有著重要的實用價值。我們嘉許的楊教授，是著名的植物生化和生理學國際權威。他傑出的研究工作集中於探索乙烯的生化和生理作用。乙烯是一種重要的氣態植物荷爾蒙，對農業有著深遠的意義。

科學發現所帶來的樂趣可以說是楊教授學術生涯的標誌。他將自己畢生的精力幾乎都傾注於探索乙烯生化合成這一課題，並對合成的途徑作了一系列的研究。他在早期的研究中，進行了多項精細的實驗，徹實無誤地證明了蛋氨酸在植物乙烯生物合成中所扮演的母體角色。然後，他又發現在蛋氨酸轉化成乙烯的途徑中，SAM是一種重要的中間生成物。1979年，他的研究又有重大突破，發現在SAM和乙烯之間的重要中間生成物——ACC。在確定ACC的化學結構過程中，他分離出一種參與乙烯生物合成途徑的酶。而這條乙烯生物合成途徑現在已被稱為"楊氏反應途徑"。

楊教授的發現不僅可以闡釋乙烯在植物發育、生長、老化、和應付環境壓力中所扮演的角色，還為農業帶來了可觀的經濟利益。把楊教授的研究成果應用於後收成期植物生物學，大大增進了我們對蔬菜、水果和花卉在儲存過程中朽壞的了解，從而為以生物技術控制腐朽過程提供了理論基礎。通過調節乙烯的生物合

International recognition of Professor Yang's achievements is abundant. He figures prominently at major research conferences and served on the editorial boards of leading journals. He has more than 220 publications in the field of plant biology to his credit. Numerous honors and awards have been bestowed on him. He won the Campbell Award of the American Institute of Biological Science in 1969; the J S Guggenheim Fellowship in 1982; the International Plant Growth Substances Association Research Award in 1985; the prestigious Wolf Prize in Agriculture in 1991; and the American Society of Horticultural Science Outstanding Research Award in 1992. In 1990 and 1992, he was elected a member of the US National Academy of Sciences, and Academia Sinica, Taipei, repectively.

Professor Yang was born in Taiwan where he received his BS and MS in Agricultural Chemistry from the Taiwan University. His PhD in Plant Biochemistry was awarded by Utah State University in 1962. After his doctorate, he went to the University of California, Davis first as a Postdoctoral Fellow, then a Lecturer and Assistant Biochemist in 1966. He was Professor and Biochemist from 1974 to 1994, and is still a Professor Emeritus at UCD. In 1994, HKUST succeeded to lure him over to be a Professor in the Department of Biology. In 1996 he returned to Taiwan to become the Vice-President of the Academia Sinica but continued as an Adjunct Professor with us.

Mr Pro-Chancellor, I have the honor, on behalf of the University, to present to you Professor Shang Fa Yang, Professor Emeritus at University of California Davis and Academician, for the degree of Doctor of Science *honoris causa*.

成過程，我們現在已經可以延長蔬果收割後的儲存壽命，並保持它們的質量。我們今天有幸享用長期保鮮的蘋果和蕃茄時，應記得感謝楊教授的貢獻。他的成就無疑會啟發科大學生踏上科研之旅，分享隨著科學發現而來的喜悅。如果你想淺嘗箇中樂趣，請閱讀楊教授最近與本校前任副校長孔憲鐸教授合編的叢書《植物生物學之發現》。

國際學術界對楊教授的研究成果屢加褒揚。在重要的學術研討會上，他的鼎鼎大名例必引人注目。此外，他還是多份著名學術期刊的編輯委員會成員，並已發表了超過220篇有關植物生物學的論著。楊祥發教授屢獲殊榮，曾獲頒多個獎項。1969年，他獲美國生物科學學院頒發Campbell獎；1982年獲J S Guggenheim研究獎金；1985年獲國際植物生長物質協會研究獎；1991年獲頒農業領域內威望崇高的Wolf Prize；1992年獲美國園藝學會傑出研究獎。他分別獲選為美國國家科學院院士和中央研究院院士。

楊教授生於台灣，並在台灣大學先後取得農業化學學士和碩士學位。1962年他獲美國猶他州州立大學頒授植物生物化學博士學位。其後，他加盟戴維斯加州大學，先從事博士後研究工作；在1966年，他轉任講師和助理生化學家。從1974年至1994年，楊祥發一直擔任教授和生化學家的工作，目前仍是戴維斯加州大學的榮休教授。1994年，香港科技大學有幸邀請到他擔任生物學系教授。1996年楊教授榮歸故里，擔任台灣中央研究院副院長。不過，他仍然是我們的兼任教授。

副監督先生，本人謹代表香港科技大學，恭請閣下向戴維斯加州大學榮休教授及院士楊祥發教授頒授榮譽理學博士學位。