Professor Alan D. Antoine 1939-2024

Left: Alan and daughter Cara getting her doctorate. Right: Alan getting his doctorate with daughter Cara.

Alan Antoine was the former Chair & Professor Emeritus, Department of Biochemistry & Microbiology, Rutgers University, New Brunswick, NJ. He was also Associate Dean of Cook College (now School of Environmental & Biological Sciences). Alan was a lifetime member and past president (1980-81) of the Theobald Smith Society and the Waksman Honorary Lecture recipient in 1997.

Professor Antoine obtained his B.S. from the University of Wisconsin, Madison. He then did his graduate work at the Johns Hopkins University-Leonard Wood Memorial Leprosy Research Laboratory and Department of Pathobiology, School of Hygiene and Public Health, Baltimore, Maryland. His graduate work involved the biochemistry and growth characteristics of *Mycobacterium* sp. (1-6). After receiving his D.Sc. in 1967, he was an NIH postdoc at the Department of Biology, McCollum-Pratt Institute, Johns Hopkins University where he studied the biochemistry of *Neurospora crassa* mutants (7).

He joined the Dept. of Biochemistry & Microbiology at Rutgers in 1969 where he received funding from Ethicon, a manufacturer of surgical sutures and wound closure devices (subsidiary of Johnson & Johnson), to study the efficacy of radiation sterilization processes (8-10). His lab also continued work on *Neurospora crassa* mutants (11).

Antoine's lab became interested bacterial nitrogen metabolism and began studying the degradation of organic nitrile pollutants, such as acetonitrile and propionitrile by the bacterium *Nocardia rhodochrous* (12) . They also studied the difficult biodegradation of high-molecular-weight acrylonitrile-methylacrylate-butadiene terpolymer using *Nocardia rhodochrous* and also the fungus *Penicillium notatum* (13). Moving on to natural environmental nitrogen biotransformations, they first studied denitrification in low oxygen NJ salt marsh soils that reduced nitrate into nitrite, nitric oxide, nitrous oxide,

and finally to dinitrogen gas (14). The lab also studied nitrogen fixation by cyanobacterial symbionts of *Azolla* sp., aquatic ferns traditionally cultivated as a bio-fertilizer in wetland paddies and finding increasing use for sustainable production of livestock feed. The fatty acid composition of the bacterial symbionts by GC-MS revealed similarities with, but also significant differences from free-living nitrogen fixing cyanobacterial *Anabaena* sp. and *Nostoc* sp. and therefore may have been different sub- species or distinct taxons (15-17). Professor Antoine retired in 2007.

Sandra, his wife of 62 years, his daughter Cara and son Edan were by his side, holding his hands, when Alan passed away on October 20, 2024.

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