

C. SivaRaman (1923–2014)

Churya SivaRaman, a renowned biochemist from CSIR-National Chemical Laboratory (NCL), Pune passed away on 24 June 2014 at the age of 90. He was one of the pioneering enzymologists of the Biochemical Sciences Division at NCL along with (late) J. C. Sadana and V. Jagannathan. The major UNDP programme of UNESCO was initiated by this trio and SivaRaman was coordinator for the same.

SivaRaman was born on 2 December 1923 in Palaghat (Kerala) to Justice C. KunhiRaman and Janaki. After graduation from Presidency College in 1945, he pursued Ph D under the guidance of M. Damodaran (University of Madras) on dietary fats in relation to liver-fat deposition. Damodaran had moved to NCL in 1948 and SivaRaman joined NCL as a scientist in 1950. He went on to become the Deputy Director and Head of the Biochemistry Division at NCL until his formal retirement in 1984. He had also been to University of Leeds, UK on deputation for 2 years. He worked on citrase, now known as citrate lyase from bacterial sources. He continued his research on the same enzyme in NCL. Citrate lyase is the key enzyme in fermentation of citrate and a possible marker in evolutionary biology. The enzyme is a complex assembled from three non-identical subunits. Two subunits have distinct enzymatic activities, and one functions as an acyl-carrier protein.

Bacterial citrate lyase, *si*-citrate synthase and ATP-citrate lyase exhibit similar stereospecificities and show cofactor cross-reactions. His group worked on citrate lyases from *Klebsiella aerogenes*, *Streptococcus faecalis* and *Escherichia coli*. One of the significant contributions by SivaRaman was on *E. coli* citrate lyase which exhibited an unusual architecture, having a single large fused acyl-carrier protein associated with six copies of each of the enzymatic subunits.



He was one of the pioneering scientists who initiated the discipline of biotechnology. He developed immobilized penicillin acylase system, the usefulness of which was established in pilot-scale studies in collaboration with S. Ramachandran and S. S. Borkar (Hindustan

Antibiotics Ltd, Pune). He also developed open pore matrices for yeast for continuous production of ethanol from cane molasses. His contributions were appropriately recognized by Vividhlaxi Audyogik Samshodhan Vikas Kendra (VASVIK), a non-profit NGO. In 1985, he was bestowed with the VASVIK award for his work on the development of high-tech process for production of 6-aminopenicillanic acid (6-APA). After his superannuation, SivaRaman continued working on penicillin acylase in an advisory capacity.

He was consultant for review of teaching and training programmes sponsored by the Department of Biotechnology, New Delhi. He was elected as Fellow of the Indian Academy of Sciences and Indian National Science Academy. He was one of the dedicated enzymologists and enzyme technologists of NCL, who showed great concern for his Ph D students and his junior colleagues. His contributions to the field of enzymology would continue to motivate generations of biochemists. SivaRaman is survived by his son and a daughter.

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Narahari Waman Gokhale (1931–2014)

Narahari Waman Gokhale, a distinguished professor of geology, passed away on 13 December 2014 at his residence in Dharwad.

Gokhale was born on 2 May 1931 in Dharwad. He had his early education at Dharwad. He obtained B Sc degree in geology from Fergusson College, Pune (1949–1951) and completed his Master's degree in applied geology from Banaras Hindu University, Varanasi (1952–1954). Later, under the guidance of Vadas he obtained his Ph D degree from University of Budapest, Hungary. He was awarded the Candidate of Science (C Sc) degree by the Government of Hungary.



Gokhale was one of the two founder faculty members of the Department of Geology, Karnatak University, Dharwad. He joined as lecturer in 1954 and served as reader from 1967 to 1980 and selection grade professor of petrology from 1980 to 1991. Before attaining his superannuation in 1991, he served as Chairman of the Department of Studies in Geology, and as Dean Students' Welfare at the University from 1982 to 1988. Structural geology and petrology were his favourite subjects. He was one of the earliest to recognize the role of thrust tectonics in Archean greenstone belts of India. During his long and distinguished career of 36 years, he guided 13 students

for their Ph D degree. In addition, he has also guided several students for M Phil and M Sc dissertations. There are numerous publications to his credit in reputed science journals. He was member of the UPSC panels, Chairman of Board of Studies in Geology and Fellow of the Mineralogical Society of India (Mysore) and FISES (Pune). He was associated with many social organizations working for the betterment of the society.

After retirement Gokhale devoted most of his time to writing books on geology. Following books were written by him between 1987 and 2011: *Manual of Geological Maps* (1987); *A Manual of Problems in Structural Geology* (1991); *Exercises on Geological Maps and DIP-Strike Problems* (1996); *Theory of Structural Geology* (1996); *Fundamentals of Sedimentary Rocks* (1998); *Geological Features and Mysteries of The Planet*

Earth (2006); *All About Water* (2009); *A Guide to Field Geology* (2011).

Gokhale is survived by his wife, daughter, sons, grand children and a large number of students.

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