

## CURRICULUM VITAE of Dr A P SATTUR

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Chief Scientist And Head  
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Degree/ Position held	Year	Subject	University/Institute
BSc (Hons)	1982	BZC	Osmania Univ, Hyderabad
M Sc	1984	Microbiology	M S University, Baroda
PhD	1990	Biochemistry	Univ of Mysore, Mysore

Degree/ Position held	Year	University/Institute
Post Doctoral Fellow	Jan 1991-June 1993	Massey University, New Zealand
Scientist (Fellow)	Dec 1993- Sept 1997	I I C T, Hyderabad
Scientist	Sept 1997- till date	CFTRI, Mysore

**A. Area of work :** microbial products, enzyme inhibitors, discovery, new molecules, fermented foods, secondary metabolites, translational products

### **B.. Fellowships:**

- (a) Post doctoral fellowship to Massey University New Zealand Jan 1991 to June 1993
- (b) DBT Overseas Associateship to Manchester University UK March 2007 to Sept 2007

**Awards :** Never Applied for any

**C. Research Publications:** 34

**D. Patents:** Indian : 11; US : 5; PCT: 3

**E. PhD Students guided :** 4

**F. MSc/MTech Student dissertations guided:** 63

**G. Projects as PI:** In-House : 4; Grant in Aid : 4; Network : 1

**H: New enzyme inhibitors discovered :** Nigerloxin, Asperaldin

**I: New Fungal Fermented Foods developed :** Nilamadana, Kaulath, Shamak and Trilambija

**J. Technologies Developed / Transferred:** A-Hango, Dolymix and Panchasudha

### **K. RESEARCH CONTRIBUTIONS FROM 1984:**

1. MICROBIAL OIL PRODUCTION / SINGLE CELL OIL
2. ENZYME INHIBITORS FROM MICROBES : A DISCOVERY PROGRAMME
- 2.1 ENZYME INHIBITORS FROM MICROBES : NIGERLOXIN
3. FUNGAL FERMENTED FOODS
4. OTHERS/ TRANSLATIONAL PRODUCTS

## 1 MICROBIAL OIL PRODUCTION / SINGLE CELL OIL (1984-1990)

In 1984, an Oil Seed Mission was commissioned by the Govt of India to increase the yields of oilseeds production and to tap the non conventional energy sources. Attention was paid to Microbial production of oil and fats. Exploratory work had begun in CFTRI when I joined in 1984.

### **Publications**

1. Production of microbial lipids by fermentation using *Rhodotorula gracilis* NCIM 5881. A P Sattur and N G Karanth Journal of Microbial Biotechnology 2(2) (1987) 116-123
2. Production of microbial lipids- A review. A P Sattur and N G Karanth Journal of Microbial Technology 3(1) (1988) 51-63

### ***The earliest publications from India on application of in vivo NMR spectroscopy on live whole cells***

- 1.. A rapid method for monitoring intracellular lipid production by H NMR spectroscopy. A P Sattur , S Divakar and N G Karanth Biotechnology Techniques 2(2) (1988) 73-76
2. Regulation of phosphate metabolism during intracellular lipid production in *Rhodotorula gracilis*. A P Sattur, N G Karanth and S Divakar Biotechnology Letters 10(10) (1988) 745-750
- 3.. Carbon -13 NMR spectroscopic study of intracellular lipid production in *Rhodotorula gracilis* A P Sattur , N G Karanth and S Divakar Current Science. 2(2) (1988) 73-76

### ***The earliest papers from India on use of statistical models for optimization of fermentation processes***

1. Production of microbial lipids: Part I- Development of a mathematical model. A P Sattur and N G Karanth Biotechnology and Bioengineering. 34(6) (1989) 863- 867
- 2.. Production of microbial lipids: Part II- Influence of C/N ratio- model predictions. A P Sattur and N G Karanth Biotechnology and Bioengineering. 34(6) (1989) 868- 871
3. Production of microbial lipids: Part III- Influence of C/N ratio-experimental observations. A P Sattur and N G Karanth Biotechnology and Bioengineering. 34(6) (1989) 871-878

### ***The earliest papers from India on development of Mathematical models for fermentation processes:***

1. Mathematical modeling of production of microbial lipids. Part I: Kinetics of biomass growth. A P Sattur and N G Karanth Bioprocess Engineering. 6 (1991) 227-234
2. Mathematical modeling of production of microbial lipids. Part II: Kinetics of lipid accumulation. A P Sattur and N G Karanth Bioprocess Engineering. 6 (1991) 235-248



## Projects

### **In-House:**

1. "Bioactive Microbial Metabolites through SSF" (April 1999 to March 2001)
2. "Bioactive Metabolites from Fungi" (April 2001 to March 2003)
3. Economic production of lipase inhibitor (April 2003 - March 2005)
4. Microbial production of inhibitors of glucosidase (Apr 2008 – Mar 2010)

### **Dept of Biotechnology, GOI:**

1. Production of a lox & platelet aggregation inhibitor by fermentation (Feb 2002- Jun 2005)

### **CSIR Network, 11<sup>th</sup> FYP**

1. Exploitation of India's rich microbial diversity (April 2007-March 2011)

### **Publications on Bioactive Molecules:**

1. A Lipoxygenase Inhibitor from *Aspergillus niger*. Rao KCS, Divakar S, Rao AGA, Karanth NG, Sattur AP\* (2002a) *Appl. Microbiol. Biotechnol.* 58: 539-542.

2. A Lipoxygenase inhibitor from *Lactobacillus casei* Rao KCS, Divakar S, Rao AGA, Karanth NG, Sattur AP\* (2002b). *Biotechnol. Lett.* 24: 511-513.

3. 14-(2',3',5', Trihydroxyphenyl)Tetradecan-2-ol, a novel acetylcholinesterase inhibitor from *Chrysosporium* Sp. Rao KCS, Divakar S, Karanth NG, Sattur AP\* (2001) *J. Antibiot.* 54: 848-849

4. Asperenone: a 15-lipoxygenase inhibitor with platelet aggregation inhibition from *Aspergillus niger* Rao KCS, S. Divakar, A.G. Appu Rao, N.G. Karanth, W. J. Suneetha, T. P. Krishnakanth and A.P. Sattur\* (2002). *Biotechnol. Lett.* 24: 1967-1970

5. Asperaldin, A new aldose reductase inhibitor from *Aspergillus niger* CFR-1046 I. Fermentation, Isolation and Characterization. K. C. Sekhar Rao, S. Divakar, M. Srinivas, K. Naveen Babu, N.G. Karanth and A.P Sattur\*. *J Antibiotics* (2003) 56 (2) 173-176

6. Sclerotiorin, a potent inhibitor of Aldose Reductase. C Chidananda, L JM Rao and AP Sattur (2006) *Biotech Letters* 28: 1633-1636

7. Sclerotiorin, a novel inhibitor of lipoxygenase from *Penicillium frequentans* C Chidananda, L JM Rao and AP Sattur (2007) *J Agric Food chem.* 55: 2879-2883

8. Strain improvement of *Aspergillus niger* for the enhanced production of asperenone C Chidananda, C Mohan Kumar and A P Sattur (2008) *Ind J Microbiol* 48: 274-278

9. Rapid screening of enzyme inhibitors using profiling of Enzymemetabolite assay by HPL (PREMA-HPLC). Vasanth KY, Muruges CS and AP Sattur. *J Enz Inhib Med Chem*(2012) 27: 132-137

10. Use of extracts cluster analysis (EXCLAN) to rapidly screen for enzyme inhibitors in microbial fermented extracts. Vasantha KY, Muruges CS & Sattur AP. *Int J Bioassays* (2014) June : 1990-1993

11. A tyrosinase inhibitor from *Aspergillus niger*. VasanthaKY, Muruges CS & Sattur A P. *J Food Sci Tech* (2014) Volume 51, Issue 10, Page 2877-2880

12. Sclerotiorin, is non-mutagenic and inhibits human PMNL 5-lipoxygenase and platelet aggregation. C Chidananda, KY Vasantha & AP Sattur\* *Indian J Expt Biol.* Vol. 53, April 2015, pp. 228-

## 2. 1 ENZYME INHIBITORS FROM MICROBES : NIGERLOXIN

In 2001, we discovered an enzyme inhibitor against lipoxygenase (LOX) and aldose reductase (AR) from *Aspergillus niger*, and named it "Nigerloxin".

### Work carried out

- ✓ Discovery & Structure
- ✓ Fermentation
- ✓ Biological Activities
- ✓ Safety & Pharmacokinetics
- ✓ diabetic cataract and nephropathy (streptozotcin induced)
- ✓ non diabetic cataract (Galactose induced)
- ✓ non diabetic (gentamicin induced) nephrotoxicity

<u>Collaborators</u>	<u>PhD Students</u>	<u>Project Assistants</u>
Dr N G Karanth	KC Sekhar Rao	Naveen Babu
Dr S Divakar	B S Suresha	B S Suresha
Dr K Srinivasan	K Y Vasantha	Saleem Javeed
Dr T R Shamala		Sneha KV
Dr A G Appu Rao		Mazhar Khan
Dr Bettadaiah		Deepak
Dr Manjunatha		D Chakradhar
Dr Tej Thakur (CDRI)		Sujita Pillai
		Priyanka N

### Projects

#### **In-House:**

1. "Bioactive Microbial Metabolites through SSF" (April 1999 to March 2001)
2. "Bioactive Metabolites from Fungi" (April 2001 to March 2003)

#### **Dept of Biotechnology, GOI**

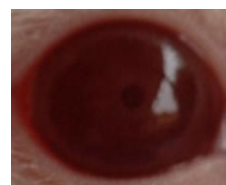
1. Biotechnological production of nigerloxin, a new lipoxygenase inhibitor of microbial origin Sept 2006 to Sept 2009
2. Investigation on nigerloxin, an aldose reductase inhibitor from *A. niger* in the treatment of diabetic complications August 2014- August 2017



**Diabetic control**



**Diabetic+ Nigerloxin**



**Normal (Basal) control**

Photo images of eyes of experimental animals

Influence of Nigerloxin on diabetic cataract

## **US Patent**

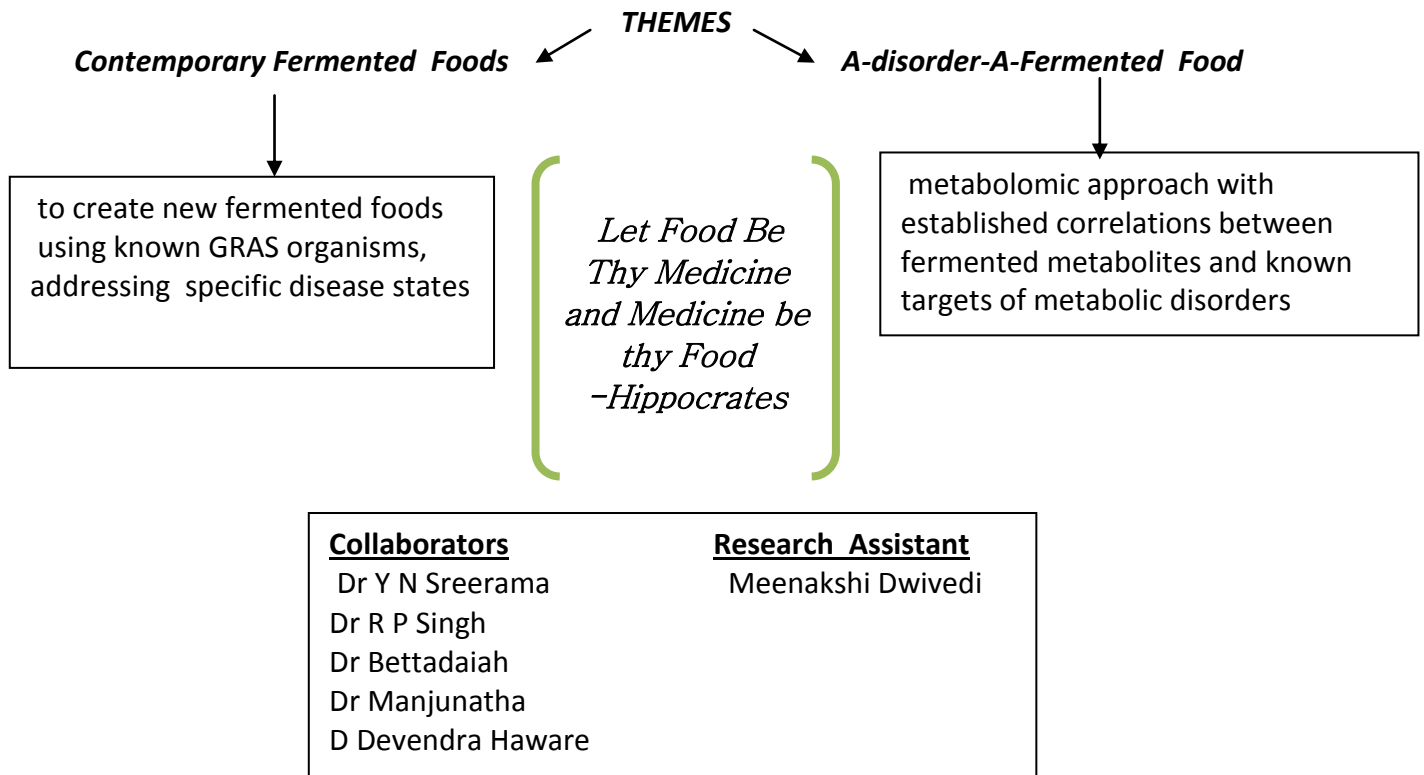
Bioactive compound and its isolation and method of treatment for lipoxygenase inhibition and as free radical scavenging agent. Sattur; et al US Pat: 7,056,707

## **Publications**

1. Nigerloxin, A Novel Inhibitor of Aldose Reductase and Lipoxygenase with Free Radical Scavenging Activity from *Aspergillus niger* CFR-W-105. K.C.Sekhar Rao, S. Divakar, K. Naveen Babu, A.G. Appu Rao, N.G. Karanth and A.P. Sattur\* *J Antibiotics* (2003) 55 (9) 789-793
2. A spectroscopic study of the interaction of nigerloxin, a fungal metabolite, with serum albumin. K. C. Sekhar Rao, A.G. Appu Rao, N.G. Karanth and A.P. Sattur (2004) *Lipids* 39: 173-177.
3. Production of nigerloxin, an enzyme inhibitor and a free radical scavenger, by *Aspergillus niger* using solid state fermentation Sekhar Rao, N G Karanth and A P Satturl *Process Biochem.* (2005) 40: 2517-2522
4. Effect of Nigerloxin morphology on production of Nigerloxin by solid state fermentation . Vasantha KY, Saleem Javed, Chakradhar D and A P Sattur. *Journal of Yeast and Fungal Research* (2014) 5(4):50-57
5. Fungal metabolite nigerloxin ameliorates diabetic nephropathy and gentamicin-induced renal oxidative stress in experimental rats Bharathinagar S. Suresha & Krishnapura Srinivasan. *Naunyn-Schmiedeberg's Arch Pharmacol* (2014) 387:849–859
6. Beneficial influence of fungal metabolite nigerloxin on diabetes-induced oxidative stress in experimental rats Bharathinagar S. Suresha, Kuntavalli Y. Vasantha, Avinash P. Sattur, and Krishnapura Srinivasan. *Can. J. Physiol. Pharmacol.* 91: 149–156 (2013)
7. Antioxidant properties of fungal metabolite nigerloxin *in vitro*© 2013 B. S. Suresha and K. Srinivasan *Applied Biochemistry and Microbiology*, 2013, Vol 49, No 6, p. 587–591
8. Beneficial influence of fungal metabolite Nigerloxin on eye lens abnormalities in experimental diabetes Bharathinagar S. Suresha, Avinash P. Sattur, and Krishnapura Srinivasan. *Can. J. Physiol. Pharmacol.* 90: 387–394 (2012)
9. Antioxidant Potential of Fungal Metabolite Nigerloxin during Eye Lens Abnormalities in Galactose-Fed Rats Bharathinagar S. Suresha and Krishnapura Srinivasan. *Current Eye Research*, Early Online, 1–8, (2013)
10. Experimental and Computational Crystal Structure Landscape Study of Nigerloxin: a Fungal Metabolite from *Aspergillus niger* SS Singh, Vasantha KY, APSattur, T Thakur. , *CrystEngComm*, 2016, 18: 1740-1751
11. A preliminary toxicity and pharmacokinetic study on Nigerloxin (Communicated)

### 3. FUNGAL FERMENTED FOODS

To create and develop new non- alcohol, non-LAB based functional fermented foods that utilize India's underutilized cereals and grains.



#### **Publications :**

1. Nilamadana, a new fungal fermented cereal based food. Minakshee D, KY Vasantha, Sreerama YN ,DJ Haware, Singh RP& AP Sattur. J Functional Foods. 15(2015) 217–224
2. Kaulath, a new fungal fermented food from horse gram. Minakshee D, KY Vasantha, Sreerama YN ,DJ Haware, Singh RP& AP Sattur. J Food Sci Tech (2015) 52: (12) pp 8371-8376
3. : Evaluation of Anti nutritional Factors in fungal fermented cereals. Minakshee D, KY Vasantha & AP Sattur. Food Sci. Biotechnol. (2015) 24(6): 2113-2116

## 4 OTHERS

### 1. MSc (Microbiology) Dissertation with Prof VV Modi , MS Univ, Vadodara. (1982-1984)

Some factors responsible for the spoilage of mangoes by *Penicillium cyclopium* V.A.

Palejwala. A.P. Sattur. V.V . Modi. Food Microbiology Vol 1, Issue 4, October 1984,255-262

### 2. DBT Overseas Associateship to Manchester University, UK

March 2007 to Sept 2007 with Prof Severino Pandiella

A malt hydrolysate mimicking the composition of that produced in a brewery by the infusion method has been evaluated as a potential substrate for fermentation by bifidobacteria with the aim of producing a potentially probiotic beverage. **Process Biochemistry, 43 (8), 2008, 848–854**

## TECHNOLOGIES/ TRANSLATIONAL PRODUCTS

### 1. A-Hango, a new food ingredient preparation against alcohol hangovers

40,000 USD Technology transferred to Praras Biosciences Pvt Ltd,  
Bangalore. Commercially available soon



A **ftri** Product

### 2 Antioxidant snacks for blue collared workers TECHNOLOGY READY



A **ftri** Product

### 3 Dolymix, an ingredient to obtain soft and enhanced number of idlys

TECHNOLOGY READY



### 4 Panchasudha, a traditional drink for modern times TECHNOLOGY READY



A **ftri** Product

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