



**IFAR 2007 Professional Development Program  
Completion Report  
[800 words]**

**Instructions:**

Please submit the completion report by email, using this form, through the sponsoring CGIAR Center to [ifar@ifar4dev.org](mailto:ifar@ifar4dev.org) within three months after the completion of the fellowship.

*Please check if Thalwitz Scholarship*

   *Yes*

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Name of Applicant    S. Anitha

Sponsoring CGIAR Center: International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), Patancheru, India

**I. Work Program goals achieved (maximum length: 200 words)**

The aim was to determine the human exposure of aflatoxin B1 (AfB1) by measuring aflatoxin-biomarker (AfB1-albumin adduct) in rural and urban areas with particular focus on Hepatitis B Virus (HBV) positive cases, in Andhra Pradesh state (AP), India. An enzyme-linked immunosorbent assay (ELISA) was used to estimate the AfB-biomarker concentration. A total of 635 serum samples (500 from HBV positive patients and 135 from patients with chronic liver diseases) were obtained in association with the Apollo Hospitals and Asian Institute of Gastroenterology, Hyderabad, India. These samples represent a cross-section of population from Medak, Rangareddy and Kurnool districts of AP. The AfB-biomarker was detected in 21.6% of 500 HBV positive samples; and in 66% of 135 samples from patients with chronic liver disorders. The AfB-biomarker concentration in all but eight positive samples was between 0.1-278 pg/mg albumin; whereas in eight samples it was very high (303-1281 pg/mg albumin). The results reflect significant exposure to AfB1 contaminated food in the subjects (31%) analyzed. Further studies are necessary to assess the association between aflatoxin exposure and liver disorders. This first study of its kind in India emphasizes the need to develop intervention strategies to reduce human exposure to aflatoxins.

**II. Plans for follow-up (maximum length: 200 words)**

This cross-sectional survey provided prime-facie evidence for significant human exposure to aflatoxins and likely association between AfB-biomarker and chronic liver disorders in India. Further studies have been initiated to assess various groups of subjects to determine the specific link between aflatoxin toxicity and liver diseases. Attempts are also being made to develop PCR-RFLP assay to determine mutations in p53 gene in the patients positive to AfB-biomarker and HBV (a mutation in p53 gene at position 249 codon was shown to lead to hepatocellular carcinoma). This test will aid in early diagnosis of HCC risk and allows prophylactic care. This study has also provided impetus to establish a new strategy termed as 'Top-Down Strategy' (TDS). TDS involves identification of the most vulnerable groups who are at the risk of frequent exposure to aflatoxins through biomarker studies, and then monitor their household diets for the sources of contamination, analyze food production and storage practices and impact of household income on dietary choices and examine agriculture and food production practices in the region to formulate appropriate strategy to minimize the contamination level at every stage. A manuscript is being prepared based on this study for publication in a peer-reviewed journal.

**III. Report budget utilization including whether budget was spent as planned (maximum length: 100 words)**

Budget was utilized more or less as proposed. Details listed below.

Item	Proposed in grant application	Budget spent
Applicant	3,000	3,204
Operational costs	2,900	2,696
Technical support	1,500	1,500
Travel	2,000	2,000
Miscellaneous (books, journals, printing, etc)	1,050	1,050
Administrative costs	550	550
Total	11,000	11,000

**IV. Assessment of the fellowship experience and general comments. (maximum length: 300 words)**

This IFAR grant has facilitated a pilot study to determine the association of aflatoxins in patients suffering with liver disorders. This study allowed field validation of ELISA technique developed at ICRISAT for AFB-biomarker estimation and demonstrated its effectiveness. This project facilitated collaboration between health centers and ICRISAT, acting as conduit for agriculture-health research pertinent to human health in developing countries. Interaction with my supervisors, Drs. P. Lava Kumar and F. Waliyar at ICRISAT, has allowed me learn-on-the job on various complex techniques enhancing my proficiency and given me confidence to plan and execute work independently. It has equipped me to plan my further career and PhD study. This grant has also provided an opportunity to present a paper in scientific conference [*Anitha, S., Waliyar, F., Reddy, C.N. and Kumar, P.L. Top-down strategy (TDS) to prevent the risk of human exposure to aflatoxins. In Abstracts: 2<sup>nd</sup> Asian Congress of Mycology and Plant Pathology 'Microbial Diversity for Asian Prosperity', December 19-22, 2007, Osmania University, Hyderabad, India. Indian Society of Mycology and Plant Pathology, Udaipur, India. pp320*].

Duration of the grant is short, but it has given just about time to get decent working exposure in a CGIAR center. The current grant approval structure was confusing to determine the period of funding. The grant period was supposed to be from Jan-Dec, but approval was given in Apr-May. IFAR clarification to sponsoring centers/grantees on flexibility in spending would help.