



INSTITUTE COLLOQUIUM
INDIAN INSTITUTE OF SCIENCE
BANGALORE

PROFESSOR A. JAGANNADHA RAO

DEPARTMENT OF BIOCHEMISTRY

&

DEPARTMENT OF MOLECULAR REPRODUCTION, DEVELOPMENT AND GENETICS

will deliver a lecture

on

**INSIGHTS INTO CELLULAR DIFFERENTIATION:
LESSONS FROM CELLS THAT ESTABLISH
LIFELINE AND SEX**

On Tuesday, the 29th JANUARY, 2002

at 4.00 PM in the Faculty Hall.

THE DIRECTOR

will preside.

All are cordially invited.

Coffee : 5.00 PM
Reception Hall

Prof. S S KRISHNAMURTHY
Convener

ABSTRACT

Cellular differentiation is a complex but a fascinating process in all multi-cellular organisms and essentially decides the fate of each cell that develops from the fertilized egg. Over the years, we have been studying the process of cellular differentiation using two model systems, namely the human placenta and Leydig cells. The placenta is an association of fetal and maternal tissues that develops during pregnancy in most mammals. It is indispensable for perpetuation of the species and is therefore described as the 'lifeline'. In its rapid proliferative and invasive properties, it essentially resembles a cancerous tissue. We have investigated the role of some of the hormones and growth factors that regulate the differentiation of highly proliferative placental cytotrophoblasts into multinucleate syncytiotrophoblasts, incapable of division.

Leydig cells, present in the testis, produce testosterone, which is indispensable for maintenance of sperm production and secondary sexual characteristics in the male. Our efforts have focussed on understanding how particular hormones exert developmental, stage-specific effects that permit Leydig cells maturation and function. These studies have also been extended to another reproductive tissue namely, the prostate, the cancer of which often turns hormone-independent and is thus not amenable for therapy by anti-hormone strategies, in most aging males. The results of our studies have provided a basis to explain mechanisms that underscore hormone-independent forms of cancers, which are the most difficult to control.