

In this issue

Focus on cardiac fibroblasts

Endomyocardial fibrosis, a heart muscle disease, is characterized by abnormal accumulation of collagen (fibrosis) in one or both ventricles of the human heart. The fibrosis leads to increased stiffness and consequent impairment of ventricular relaxation. More than four decades after its recognition, the mechanism of development of fibrosis in the disease remains obscure.

In the normal heart, fibrillar collagen is present in good measure and contributes to the structural integrity of the organ. When it is deficient or the fibrils are improperly cross linked, the heart loses its shape and appears dilated. Conversely, when there is disproportionate rise in collagen content, the stiffness of heart increases. The synthesis and degradation of collagens in the heart is done by cardiac fibroblasts which reside within the interstitial space of the myocardium and the walls of the intramyocardial blood vessels.

Curiously, the contribution of these fibroblasts to the structural alteration in endomyocardial fibrosis has not been systematically evaluated. In this issue, Kartha (page 598) provides histologic evidence for the hyperplasia of these cells in the disease. It appears that fibrosis in endomyocardial fibrosis is dissimilar to the structural remodelling which follows myocyte death caused by ischaemia and infections. On the contrary, the pattern of fibrosis closely resembles the reactive myocardial fibrosis accompanying renovascular hypertension. It is significant that some of the speculative etiological factors can potentially stimulate the synthesis of collagen by cardiac fibroblasts. The focus on these cells in endomyocardial fibrosis could provide insights into the modulation of

fibroblast activity and collagen metabolism in the disease. An attractive possibility in the future is that the growth potential and metabolic behaviour of these cells can be influenced by pharmacological agents to achieve structural remodelling of the diseased myocardium.

Tolerance and intolerance towards aliens: the wasp way

While most animal species are solitary or at best ephemeral or capricious associations of individuals, a few display exquisitely structured social organization, with a well-defined role for everyone. The pinnacle of sociality is seen in highly eusocial insects—ants, bees, wasps and termites—where such a division of labour is carried to its logical conclusion; some individuals produce all the children, others do all the work. Why should this be so? Why should anyone give up reproduction and merely help others, in direct contradiction to the dictates of the evolutionary theory? This major paradox, first put forward by Darwin himself, remained unresolved for more than a century, whereafter, in the sixties and seventies, three different solutions to it were proposed.

The celebrated genetical predisposition theory of W. D. Hamilton recognized the importance of the male-haploid, female-diploid system in these insects, whereby a female is more closely related to her sister than her offspring, thus making eminent evolutionary sense for a selfish gene in a female to program her to raise sisters by helping her mother. The more Machiavellian parental manipulation hypothesis of Alexander and Eberhard postulated that the queen simply dominates some of her daughter into working for her; the daughter have no choice

in the matter. The third and more intriguing mutualistic interaction hypothesis of Lin and Michener suggested that the workers may simply be bidding their time by continuing to work till a more appropriate moment, when one of them can overthrow the queen and assume the reproductive role. While not mutually exclusive, the three solutions are distinct enough to generate cults of loyal adherents for each of them, who have gathered impressive theoretical and experimental evidence, based on detailed studies of intra-colony interactions, in support of their cause.

The next stage of complexity of social behaviour is probably reached when interactions between social groups become significant. For highly eusocial species like ants, such inter-colony interactions are often spectacular; with prolonged battles involving thousands of soldiers. The ultimate result, however, is rather simple—violent deaths. The primitively eusocial wasps, on the other hand, have a much wider repertoire of response; the intruder may be immediately killed, or simply chased away, or even allowed to join and become a part of the colony. The article on page 601 by Venkataraman and Gadagkar presents the results of an interesting exploration of this phenomenon—the response of a wasp colony towards aliens.

NRDC: then and now...

It may be a somewhat cynical but fairly correct assessment that Indians tend often to 'follow' what is done in the West at least in the field of technology development. Long ago, UK set up an NRDC (National Research Development Corporation) in an attempt to tap the technological potential of academia. Following this we in India also set up an

NRDC in 1953. The UK NRDC was wound up a few years ago but our NRDC was not. It was not an unqualified success. Universities and research laboratories vied with each other to find ways to avoid using NRDC as an interface to commercialize technologies developed by them, since NRDC was seen more as a hindrance than a help.

Things have, however, changed considerably—for the better—in recent years. There is a dynamism and a professional approach in the

way NRDC functions now. In addition to providing technologies, they also invest financially in major industries taking up NRDC-mediated technologies. This is not to say that all is well between NRDC and the research laboratories. Many still feel that the agency could shed some of the procedures still burdening it. There are still some weaknesses and shortcomings by way of technology proving and consultancy help.

The article on page 569 describes the phenomenal strides made by

NRDC from an unwanted agency in 1953 to a dynamic force in fostering indigenous technologies in the nineties.

We decided to publish this article even though the style does not completely conform to this journal, since indigenous technologies appropriate to the Indian manufacturing milieu have assumed a tremendous importance now when the Indian government is throwing its doors open to liberalize the country's economy.

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