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From the Director's Desk

The 2008 Nobel Prize for Medicine has been deservedly bestowed on two co-discoverers of HIV-1, Prof. François Barre-Sinoussi and Prof. Luc Montagnier. Following the medical reports of a new immunodeficiency disease in 1981, Prof. Barre-Sinoussi and Prof. Montagnier identified LAV in 1983, which was later renamed HIV. This led to the development of diagnostic kits, a key contributor to (a) estimating the prevalence of the pandemic and its distribution; (b) diagnosis of individuals and including them in care and treatment services; and (c) screening for safe blood supply. Their discovery that the retrovirus was novel and that it did not induce uncontrolled cell growth - was a prerequisite for understanding the biology of the disease, eventually leading to the development of antiretroviral treatments that are now available worldwide, and are becoming increasingly affordable. It all begins with understanding the basics of HIV biology, pathogenesis and genetic constituents of protection, which may lead to newer prevention technology.

Fittingly, speakers at the recently concluded HIV SCIENCE 2008, the first national HIV Science symposium at Chennai, hosted by YRG CARE, highlighted the need to understand the recent trends in HIV research. I would like to congratulate and thank the organizing committee, delegates, speakers, sponsors, scientists and well-wishers who made significant contributions to the success of the symposium. In this issue you will find interesting articles that have been set to understand the recent trends in HIV medicine. I hope that you will enjoy reading this issue.

Sincerely,

Prof. Suniti Solomon, MD.
Editor-in-Chief



MINIREVIEW

Basic Science

HIV-Exposed, Persistently Seronegative Individuals: An Unsolved Puzzle?

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By the mid 1990s, it was clear that some individuals with frequent exposure to HIV did not become infected, as defined by the criteria of seroconversion, virus isolation or detection of HIV nucleic acid in blood samples. Such individuals have been referred to as 'exposed, seronegative' (ESN), 'highly-exposed, persistently seronegative' (HEPS), or 'exposed, uninfected' (EU). Early reports described this phenomenon primarily among commercial sex workers who reported frequent high-risk contact with multiple HIV-positive partners. However, other groups of ESN individuals have since been identified; these have included persons with occupational exposure to HIV such as needlestick injuries; intravenous drug users with parenteral exposure to HIV; children born to HIV-positive women, and seronegative heterosexual or homosexual partners of HIV infected subjects [reviewed in 1]. "Serodiscordant" couples are defined as those in which one partner is HIV positive and the other remains HIV seronegatives.

Do ESN Individuals Represent a "Naturally Immunized" Group?

Since the 1990s, numerous studies have examined ESN cohorts for cellular and humoral responses to HIV, in the hope of defining immunological correlates of protection that might be inducible by vaccination. Since the development of cell-mediated immunity in an uninfected host requires exposure (immunization) to components of the infectious agent, it was hypothesized that repeated low-level exposures to HIV through sexual contact might induce protective immune responses in ESN individuals without leading to systemic infection and seroconversion. For example, cytotoxic T-lymphocytes (CTL), which eradicate virally-infected target cells by MHC class I-restricted killing, might be induced following a low-level, self-contained infection. In 1995, Sarah Rowland-Jones and colleagues at Oxford University reported the detection of CTL recognizing HIV peptides in 3 of 6 high-risk commercial sex workers in the Gambia, West Africa, but none of 19 low-risk control individuals [2]. In 1998, the same group reported similar findings in a study of high-risk uninfected sex workers from the Pumwani area of Nairobi, Kenya, where HIV seroprevalence was estimated at 90-95% [3]. HIV-specific CTL were detected in 10 of 21 Nairobi sex workers, but not in low-risk control women. Taken together, these two reports of HIV-specific CTL responses in ESN individuals suggested that cell-mediated immune responses might be an important component of protection from productive infection and seroconversion.

Are CTL Responses Protective in ESN?

Three subsequent reports concerning the Nairobi sex worker cohort contributed new findings to the field, and also generated some controversy. First, it was reported that HIV-specific CTL could be isolated from cervical cytobrush samples of high-risk women, raising the possibility that CTL residing in the cervicovaginal mucosa might play a role in protection [4]. Second, several formerly seronegative sex workers from the Nairobi ESN cohort reportedly became seropositive [5]. The key epidemiologic correlate of seroconversion appeared to

be reduction in the frequency of sex work, during which time HIV-specific CTL activity waned [5]. This finding suggested that repeated exposure, perhaps analogous to 'boosting' immunization, was essential for maintaining protective immunity.

Finally, the fine specificities of CTL responses in ESN and HIV-positive subjects from the Nairobi cohort were mapped and compared in an attempt to identify potentially protective peptides [6]. Although many peptides were recognized by both groups, some appeared to be preferentially recognized by ESN; in general, these were restricted by MHC Class I alleles associated with reduced risk of HIV infection in this cohort (i.e., A2, A*6802, A24 and B18). Taken together, this body of work lent support to the hypothesis that the combination of favorable genetics (i.e., the inheritance of certain MHC class I alleles) and the induction of CTL responses following repeated low-level exposures, could contribute to protection in some individuals.

Controversy in the CTL Field.

Promising as these findings appeared to be, several questions remained to be addressed: first, if HIV-specific CTL responses were indeed protective, why were CTL detected only in a subset (generally 30-50%) of ESN individuals, and why only on some occasions, rather than consistently? Second, why were the magnitude (i.e., percent HIV-specific CD8+ T-cells) and breadth (i.e., number of peptides recognized) of CTL responses in ESN often lower than in those detected in HIV-positive individuals? Surely "protective" responses would be predicted to show greater breadth and/or magnitude than responses in infected subjects? Could these responses truly be considered as protective, or were they simply a marker for previous HIV exposure?

Not all studies of ESN cohorts have reached the same conclusions. In one study, Hladik *et al.* performed ELISPOT assays to test for HIV-specific IFN- γ production in blood samples from exposed, seronegative homosexual men [7]. As a control group, these authors studied sexually active men with no known exposure to HIV. When results in ESN were compared to those in high-risk controls, only 3 of 15 ESN had distinctly positive responses, and all three were heterozygous for CCR5 Δ 32 [7], a mutation that limits the infectability of CD4+ T-cells by decreasing surface expression of the HIV coreceptor CCR5.

Still other studies have failed to detect significant HIV-specific CTL responses in ESN groups [8, 9]. One study, performed in a blinded fashion, evaluated HIV clade C-specific T-cell responses by ELISPOT and intracellular cytokine staining in serodiscordant couples from Lusaka, Zambia. A strength of this study was that two different methods were used to assess responses in the same samples. Although strong CTL responses were detected in all HIV-infected individuals, no such responses were detected among the ESN partners [8]. It should be noted that unlike the sex workers in Nairobi, who reported daily exposure, the Lusaka discordant couples reported only 3-4 high-risk contacts per month. The sharp contrast between the conclusions drawn by these two studies and previous papers illustrates that differences in ESN exposure profiles and the selection of control groups, as well as technical considerations such as differences in experimental protocols and statistical analyses, may strongly influence outcome and interpretation.

Do ESN have HIV-specific CD4+ T-cell Responses?

Some of the earliest reports of ESN cohorts described HIV-specific CD4+ "helper" T-cell responses, using either a bioassay for IL-2 production [10, 11] or a lymphoproliferation assay involving ³H-thymidine incorporation [12]. More recently, Pallikkuth and colleagues, working in North India, demonstrated HIV gag-specific T-helper responses in ESN individuals [13], and others reported low-level HIV-specific CD4+ T-cell responses in blood from high-risk sex workers in Abidjan, Côte d'Ivoire [14]. However, as with the CTL studies, other investigators have failed to observe significant differences in HIV-specific CD4+ T-cell responses between ESN and low-risk individuals [9].

Do ESN have HIV-specific Mucosal Antibodies?

Several groups have tested for the presence of HIV-specific antibodies, particularly IgA, in mucosal secretions. If the literature on HIV-specific T-cell responses in ESN remains controversial, the same may be said of studies on HIV-specific mucosal antibodies. HIV-specific IgA has been reported in mucosal secretions from Nairobi sex workers [15] and other cohorts. Furthermore, mucosal IgA from ESN women was reported to neutralize both T- and M-tropic HIV strains *in vitro* [16], and to inhibit HIV transcytosis *in vitro* across a polarized epithelial cell line simulating an epithelial barrier [17]. Thus, it has been proposed that HIV-specific IgA, secreted locally at mucosal

surfaces, might serve to block viral infection either by neutralizing virus or by blocking intracellular transport across epithelial cells.

Despite these intriguing results, other studies have reported that ESN subjects lack HIV-specific IgA in secretions [18, 19]. These discrepancies might be related to differences in the cohorts studied, or to methodological difficulties inherent in measuring mucosal IgA. Recent studies involving several experienced research groups determined that there is enormous inter-laboratory variability in IgA measurements, likely due to such factors as variability in sample collection methods and laboratory assay procedures [20].

HIV-inhibitory Soluble Factors.

Several investigators have reported increased β -chemokine expression and/or increased non-cytolytic HIV suppression mediated by CD8+ T-cells from ESN [1, 21]. One recent study investigated this topic in a North Indian ESN population [22]. As with other potential correlates of protection, these soluble factors have not been detected in all ESN cohorts.

Other Immune Mechanisms.

Most studies focusing on immune correlates of protection have studied adaptive responses to HIV viral proteins. However, other immune-mediated protective mechanisms have also been proposed, including antibodies to "self" proteins such as CD4 or CCR5 that might block infection of CD4+ T-cells [23, 24]. There has also been interest in identifying innate immune mechanisms, such as natural killer cells, that might afford protection in ESN cohorts [25].

Occult HIV Infection.

One hypothesis to explain the ESN phenomenon is that some high-risk individuals harbor extremely low levels of infectious HIV in blood and/or tissues. A study by Zhu *et al.* demonstrated HIV DNA (as low as 0.05 copies/10⁶ CD4+ T-cells) in 2 out of 10 ESN [26]; the DNA was highly homogeneous, suggesting little or no active replication. A similar study by Koning and colleagues reported slightly higher levels of HIV DNA in sequential PBMC samples from ESN [27]. Zhu and colleagues speculated that ESN individuals control HIV by immunological means [26], while Koning *et al.* suggested that these low levels of HIV DNA correspond to "dead-end" virus or "silent" infection [27]. Whatever the explanation, these studies raise the possibility that occult infection may be more common than previously assumed among high-risk individuals.

Genetic Factors Associated with HIV Resistance.

MHC Class I and II alleles.

Because the cell-mediated immune responses identified in ESN are controlled by the polymorphic major histocompatibility complex (MHC), several groups have studied associations between inherited MHC alleles and ESN status [28]. HLA-B*27 and B*57 are associated with a favorable prognosis, while HLA-B*35 and B*53 are associated with unfavorable prognosis [28]. However, these relationships apply only to individuals who are already infected, and appear to serve no prognostic value regarding ESN. In fact, few clear associations have been made between MHC class I/II alleles and protection. The HLA-A2/6802 supertype has been associated with protection from HIV subtype A infection among women in Kenya, and was detected at increased frequency among ESN as compared to subtype B seroconverters in the United States [28]. However, this apparent protective association did not extend to HLA-A*6802 ESN from Zambia who were exposed to HIV subtype C. There is some evidence that HLA Class I concordance (i.e., sharing of the same alleles) between partners may increase the seronegative partner's susceptibility to infection. This effect has been reported for both sexual transmission [29] and mother-to-child transmission (30), and suggests that alloreactive T-cells may help to protect against transmission.

HIV Coreceptor Genes, Cytokine Genes, and Others.

Polymorphisms in HIV coreceptor genes (i.e., the chemokine receptors CCR5 and CXCR4) can influence the susceptibility of primary CD4+ T-cells to viral infection. The CCR5 Δ 32 allele occurs at a frequency of approximately 9% in Caucasian individuals of European descent, and accounts for resistance to HIV infection in some ESN; however, this allele occurs more rarely in African or Asian populations [28].

Recently, several studies have assessed the prevalence of relevant polymorphisms in Indian populations [reviewed in 31]. One study found an association of IL-10 promoter polymorphisms with HIV infection rates in North Indians; the frequency of IL-10 592 A was significantly increased in HIV positive individuals compared to seronegatives [32]. Another study evaluated DC-SIGN



polymorphisms in North Indian ESNs, finding that most DC-SIGN polymorphisms were present at similar frequencies in HIV positive and ESN groups [33]. However, one DC-SIGN receptor tandem repeat polymorphism appeared to show a significant difference between groups. Polymorphisms in chemokines and their receptors have also been studied in North Indian ESN [34]; however, no association was found between HIV susceptibility and any of the following polymorphisms: CCR5-Δ32, CCR2-64I, CX3CR1-280 M, CX3CR1-249I, SDF-3'A, RANTES-28G and RANTES-403A.

Conclusions.

Despite numerous studies to assess immune correlates of protection in ESN over more than a decade of research, there has been great difficulty demonstrating that adaptive immune mechanisms, either individually or collectively, are responsible for protection. Some responses may be indicators of past exposure rather than true correlates of protection. Furthermore, since the responses described above have been detected in some, but not all ESN subjects, it is nearly impossible to ascribe a convincingly protective role to any single factor. A more likely explanation is that multiple mechanisms contribute to protection, likely including genetic factors that remain to be fully elucidated. Studies of ESN populations in India have accelerated over the past several years, but further well-controlled studies are still needed, both in India and in other parts of the world, in order to understand the basis for this intriguing and puzzling phenomenon.

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MINIREVIEW

Epidemiology

HIV/HCV Co-Infection among Injecting Drug Users in India

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IDU is the predominant mode of transmission in the fastest growing epidemics of The Russian Federation, the Former Soviet Union and Central Asia [1]. India is home to ~1.1 million IDUs with ~30% HIV prevalence and ~60-80% hepatitis C virus (HCV) prevalence [1]. In the highly active antiretroviral therapy

(HAART) era, HCV has emerged in developed countries as a leading cause of morbidity and mortality causing up to 50% of deaths among HIV-infected patients [2-10]. Further, HCV co-infection complicates delivery of antiretroviral therapy (ART), leading to high rates of hepatotoxicity and treatment discontinuation [11 - 15]. Without effective management and treatment, the trajectory of HCV in developing countries is likely to parallel what has happened in the developed world. However, there are limited data on the burden of liver disease associated with HIV and HCV from developing countries including India.

Epidemiology.

HIV and HCV share similar modes of transmission; however, the rates of HIV/HCV co-infection are variable by route of transmission and can range from 10-14% among persons reporting high risk sexual exposure to 85-90% among those reporting IDU. Overall, the majority of data on HIV/HCV co-infection have come from the US and Western Europe and have suggested that ~33% of HIV-infected persons are co-infected with HCV [16,17]. There are fewer studies from the Asia-Pacific region; but a recent study suggested that ~10% of HIV infected persons were co-infected IDUs [18]. However, this likely represents an underestimate because it is based on persons in regular HIV care; IDUs are likely to have been underrepresented. Almost universally, the prevalence of HCV among IDUs with HIV is ~90% and higher. In Chennai, the prevalence of HCV among HIV-infected IDUs was recently reported to be 95% compared with 48% among HIV negative IDUs [19].

Natural History.

Whether or not HCV impacts HIV disease progression has been controversial [16, 20]. The majority of studies have observed no impact of HCV on HIV disease progression, but a few studies have observed that HCV is associated with impaired immunologic reconstitution [20]. However, this effect even on immunological reconstitution has not appeared to be clinically relevant. By contrast, HIV co-infection has consistently been associated with increased HCV viral persistence, higher HCV RNA levels and more rapid disease progression to both cirrhosis and end-stage liver disease (ESLD) [21 -25]. Further, the effect is strongest with increasing levels of immunosuppression [25,26]. What is less clear is the effect of highly active antiretroviral therapy (HAART) on the natural history of HCV. Some studies have documented lower rates of disease progression among persons receiving HAART [25, 27] whereas, in other studies, no beneficial effect of HAART has been observed [28, 29]. Finally, it is possible that HIV itself may impact liver disease independent of HCV and HAART though this has been less well documented.

Antiretroviral hepatotoxicity.

The largest impact of HCV on HIV is the increased risk of hepatotoxicity associated with HCV co-infection. In randomized controlled trials, incidence rates of severe (grade 3/4) ART hepatotoxicity have ranged from 1-14%; the highest rates are associated with nevirapine and ritonavir containing regimens.30 Observational studies have also suggested high rates of hepatotoxicity associated with nevirapine and rates tend to be highest among HCV and HBV co-infected patients. For example, Wit *et al* observed a 6.3% incidence of hepatotoxicity among 560 patients, and independent risk factors for hepatotoxicity included a nevirapine or high-dose ritonavir regimen as well as chronic infection with hepatitis B or C [31]. Among HIV-infected patients in Baltimore, MD observing rates of hepatotoxicity 8-20% with the highest rates among those receiving high-dose ritonavir (17%) or nevirapine (16%) [12 - 14, 32]. Co-infection with HCV or HBV has been consistently shown to be an independent risk factor for hepatotoxicity; the effect of hepatitis appears strongest in those receiving nevirapine [12 - 14, 32]. Severe complications due to hepatotoxicity tend to be rare, but discontinuation rates have been as high as 60% [32].

Special considerations in HIV/HCV co-infection in India.

Beyond the large burden of HIV/HCV co-infection in India, particularly among IDUs, very little is known on the specifics of HIV/HCV co-infection in India. Several factors make India a unique setting for HIV/HCV co-infection and suggest that potential the natural history and treatment issues may be different in India compared to Western settings where most of the work has been done. Most studies on interactions between HIV and HCV have been conducted in settings where HIV subtype-B predominates [25, 26]. HIV subtype-C is the predominant circulating genotype in India [33] though some reports from IDUs in the Northeast have identified a sizeable number of subtype-B and B/C recombinants [34 - 36]. There is no information on HCV genotypes among IDUs in India but limited data from non-IDUs suggest that the most common genotype is 3 (62.2% to 88.5%), followed by 1b (9.5% to 18.8%) and genotype 2 (5.5%) [37, 38]. Reports from Africa have suggested different rates of disease progression and resistance development across HIV subtypes [39 - 41]. Mehendale and others also found evidence to support more rapid progression of

HIV in India, some of which may be the influence of subtype-C [42]. Similar comparisons in terms of liver disease, especially in the presence of HCV infection, in developing country settings are lacking.

Beyond genetic differences, IDUs in India have a range of underlying disease and co-infections that may differentially impact liver disease progression independent of HIV and HCV, including high levels of malnutrition, tuberculosis (TB), malaria and hepatitis B virus (HBV) [43 - 45]. Both TB and malaria have been suggested to impact HIV progression, and an effect on HCV is also plausible. Other differences such as high-levels of alcohol, marijuana and prescription drug abuse may further impact disease progression [46]. Finally, it is well established that certain anti-TB medications and antiretrovirals can cause hepatotoxicity [11-15]. While particular regimens are contraindicated in persons with chronic HCV, accessibility to alternate regimens in resource-constrained settings is low [47]. Identifying specific factors that cause hepatotoxicity in this population may provide insight for screening tools that can be used to differentiate between persons who can and cannot tolerate specific medicines. Further, though it is well established that HCV increases hepatotoxicity risk, few studies have looked at the impact of disease stage. Presumably, persons with less liver damage will not be at the same risk for hepatotoxicity as those with more fibrosis.

The latest figures presented by NACO, India at the recent International AIDS Society Conference in Mexico City indicate that ~100,000 persons have initiated HAART in India via the Government of India's (GOI) free roll-out program; an additional 50,000 persons are believed to have initiated HAART in the private sector. The most commonly prescribed regimen in both settings (public and private) is a fixed-dose combination of stavudine (d4T), nevirapine (NVP) and lamivudine (3TC) [47]. Only 1.4% of those initiated on HAART through the GOI were IDUs and all were from the Northeast [48]. However, this is likely to change as IDUs are a key focus of NACO's current National AIDS Control Program (Phase III) [49]. In spite of the recognized hepatotoxic effect of NVP, it remains part of the most commonly-prescribed first line regimen among IDUs. It will be important to characterize the impact of the use of such regimens on liver disease among IDUs in India.

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RESEARCH COMMENTARY

Clinical Immunology

Immune Dysregulation in TB-IRIS: Role of Th1 and Foxp3⁺ T-Lymphocytes Suspected

Original article: Wilkinson KA, et al. Th1 and FoxP3 positive T cells and the HIV-tuberculosis immune reconstitution inflammatory syndrome. *Am J Resp Crit Care Med* 2008 (In press).

Summary. The immunopathophysiological mechanisms that underlie HIV-TB associated immune reconstitution disease (TB-IRIS) are described.

Commentary. TB-IRIS in HIV-infected patients initiating highly active antiretroviral therapy (HAART) leading to 'paradoxical clinical worsening' results from restored immunity to tuberculosis antigens. Possible mechanisms include a partial recovery of the host immune system or exuberant immunological responses to TB antigenic stimuli. A number of case series of TB-IRIS have been reported heretofore with recognised risk factors being disseminated tuberculosis, a low nadir CD4+ T-lymphocyte count, high plasma viral load and short interval between initiating antituberculous therapy (ATT) and antiretroviral therapy (ART). Although several studies have been conducted in the past to reveal the immune and clinical attributes of TB-IRIS, and certain other mechanisms have been proposed by researchers across the globe in regards to the immune dysregulation in TB-IRIS, the Th1 and regulatory components of TB-IRIS have been poorly understood and described. Wilkinson and others in a cross-sectional study have investigated the frequency of IFN- γ secreting T-lymphocytes that recognize ESAT-6, α -crystallins (acr) 1 and 2 and purified protein derivative (PPD) antigens of *Mycobacterium tuberculosis*, and found that IFN- γ was higher in TB-IRIS patients than in similar patients treated for both HIV-1 and tuberculosis who did not develop IRIS (non-IRIS, $p \leq 0.03$). The biggest difference was in recognition of acr molecules: peptide mapping showed a polyclonal response. Further, FACS analysis indicated equal proportions of CD4+ and CD8+ cells positive for activation markers HLA-DR and CD71+ in both TB-IRIS and non-IRIS patients. Expression of the forkhead box transcription factor P3 (FoxP3) has been associated with depression of *M. tuberculosis* antigen specific effector T cell responses leading to the hypothesis that delayed combined antiretroviral treatment (cART) mediated restoration of such presumed regulatory T cell responses underlies TB-IRIS. The percentage CD4+FoxP3+ was low in both groups (TB-IRIS 5.3 \pm 4.5 versus 2.46 \pm 2.46 non-IRIS, $p = 0.13$). Eight weeks' longitudinal analysis of tuberculosis patients starting cART showed dynamic changes in antigen-specific IFN- γ secreting T lymphocytes in both TB-IRIS and non-IRIS groups: the only significant trend was an increased response to PPD in the TB-IRIS group ($p = 0.041$). There seems to be an association between Th1 cell expansion and TB-IRIS. However, the occurrence of similar expansions in non-IRIS cases needs to be investigated further.

EM Shankar, PhD.

RESEARCH COMMENTARY

HIV Monitoring

Simple and Low-cost Therapeutic Monitoring Assay for Nevirapine!

Original article: Rafaëlla et al., Therapeutic drug monitoring of nevirapine in resource-limited settings. *Clin Infect Dis.* 2008; 47:1339 - 44.

Summary: The authors have described in this article the validation of newer methodology, thin-layer chromatography (TLC) for semi-quantitative detection of

saliva concentrations of nevirapine drug for use in resource-limited settings. The TLC assay was validated against high-performance liquid chromatography (HPLC). The technical sensitivity and specificity of the TLC with plasma are 92% and 99% respectively and with saliva, 100% and 99% respectively.

Commentary: Nevirapine is one of the widely used drugs in the HAART era. Although therapeutic drug monitoring (TDM) has several advantages in optimization of antiretroviral therapy and clinical management of HIV disease, it is hardly being used in the resource-limited settings. The TDM has been shown to be an excellent tool for managing concentration-related toxicities and drug adherence. Moreover, the inter-individual variability in the pharmacokinetics of antiretroviral drugs has shown to be significantly high for NNRTI and PI drugs. The study by Rafaella *et al* had shown excellent sensitivity and specificity of the TLC assay in detecting nevirapine in plasma and saliva specimens, interestingly higher sensitivity with saliva than plasma. Use of saliva specimen has the additional benefit of being a simple and non-invasive procedure. Although accumulated evidence favors the use of TDM, it is being predominantly used in the developed countries due to the cost and accessibility. Another recent study with low-cost and rapid immunochromatographic assay (Cressey *et al*, 2007) also has been shown to be performing well. These alternate methodologies could benefit resource-limited settings for providing better HIV clinical care.

P Balakrishnan, PhD.

RESEARCH HIGHLIGHTS

Compartment-specific Aminoacid Changes in *Env* Domains Linked to Immune Evasion of HIV-1

N-linked glycosylation is believed to be an important mechanism for minimizing virus neutralizing response and is present on the HIV envelope glycoprotein. Although it is known that changes in glycosylation can dramatically influence virus recognition by the host antibody, the actual contribution of compartmental differences in N-linked glycosylation patterns remains unclear.

Australian scientists have identified single cell/compartment-specific amino acid changes and differences in N-linked glycosylation patterns between plasma and diverse blood leukocytes. They amplified the *env* gp120 C2-V5 region and analyzed 305 clones derived from plasma and other compartments from 15 HIV-1 patients. Computational network analyses revealed the evidence for cell-specific single amino acid changes specific to monocytes. In addition, significant variations were found in the total number of N-linked glycosylation sites between patients. Moreover, significant differences in the number of glycosylation sites were observed between plasma and cellular compartments. Bayesian network analyses have shown interdependency between N-linked glycosylation sites detected, which may have immense functional relevance. It is believed that these studies will provide crucial insights into the host immune response and its ability in controlling HIV replication *in vivo*. These findings could also have relevance in shielding and evasion of HIV-1 from neutralizing antibodies. [Ho YS, *et al*. *Virology Journal* 2008, 5:14].

Keratinization: An Alternative to Circumcision

Circumcision as we know is the removal of the foreskin, a haven of Langerhans cells that get infected when exposed to large numbers of HIV virions. Pask and others have a less daunting alternative to HIV prevention. The foreskin, they observed is studded with oestrogen receptors (ER α and ER β). The study group showed that within 24 hours of topical administration of oestriol, the foreskin began to keratinize and the response persisted for ≤ 5 days after cessation of the treatment. This keratinous thickening, they say could act as a protective layer for the underlying Langerhans cells. Oestriol is a

weak, naturally occurring oestrogen metabolite that is normally present in male urine, and is unlikely to cause hypothalamic inhibition or gynecomastia [Pask AJ, *et al*, *PLoS One* 3(6):2008:e2308].

Nef Therapy Down the Pipeline?

Dr. Collins and others have embarked on a new understanding of HIV pathogenesis in CD4 cells, which they think could pave the future for newer drugs. Current HIV therapies are aimed at stopping HIV replication or infection of new cells but can do nothing about removing infected cells.

The normal function of MHC I is to take viral antigens from the interior of a cell and present them on the outside, essentially signalling that the cell is infected and thereby attracts immune cells to come and destroy it. In a series of experiments, the researchers showed that one of the functions of nef is to prevent MHC I molecules from reaching the surface of the infected cell. Nef binds the emerging MHC I molecules to a "trafficking" molecule AP-1, whose job is to move other molecules about within the cell. But AP-1 doesn't go near the cell surface, so the nef-initiated binding prevents the MHC I molecules from doing their job. In a second step, nef binds the MHC I molecules to another protein, β -COP, that initiates a process of degradation, eventually destroying the MHC I molecules entirely.

Interestingly, the researchers also found that nef quickly binds CD4 molecules to another trafficking molecule called AP-2 which whisks them into the interior of the cell, where nef binds them to β -COP, which, as in the case of the MHC I molecules, starts the process of degradation. Knowledge of these new functions whereby nef uses the cellular trafficking machinery for abnormal purposes could facilitate R&D of novel drugs that disrupt these functions [Schaefer MR, *et al*, *PLoS Pathogens* 4(8):2008:e1000131].

One More Can of Worms: Helminths may Increase Susceptibility to HIV-1

Sub-Saharan Africa is home to 10% of world's population, yet alarmingly 2/3 of all HIV-1 infected cases occur here. This unsymmetrical HIV-1 infection rate could possibly be linked to the highly prevalent helminthic infections that are endemic there. Chenine and colleagues prospectively tested this hypothesis in a relevant *in vivo* model by exposing rhesus macaques with acute *Schistosoma mansoni* infections to pre-quantified amount of a clade C Simian immunodeficiency virus. Interestingly it was observed that, when compared to control monkeys, monkeys with *Schistosoma* infection required 17 fold lower levels of virus to get infected. Significantly higher levels of initial viral replication and loss of memory cells indicating rapid progression to immune dysfunction were observed in monkeys infected with *Schistosoma*. Hence this study documents the first direct evidence that worm infections may increase the risk of acquiring HIV-1 infection on exposures [Chenine A-L, *et al*. *PLoS Neglected Tropical Diseases* 2008 ;2(7): e265].

Out of the Blue: High Levels of HIV Specific CD8+ T Cells have No Role in Disease Outcome!

T-cell immunity plays a pivotal role in control of HIV infection. HIV specific central memory CD8+ and CD4+ T cells producing IFN- γ and IL-2 are hypothesized to determine the clinical outcome. To test this hypothesis, Schellens and colleagues investigated in a cohort of individuals with known date of seroconversion whether the presence of cytokine producing HIV specific CD8+T cells early in infection was associated with AIDS-free survival time. Kaplan-Meier survival analysis and Cox proportional hazard models revealed that frequencies of cytokine producing HIV specific CD8+ T cells shortly after seroconversion were neither associated with time to AIDS nor with the rate of CD4+ T cell decline, thereby demonstrating that, irrespective of subsequent clinical outcome, high numbers of functional HIV-specific CD8+ T cells can be observed early in HIV infection [Schellens IMM, *et al*. *PLoS One*, 2008; 3(7): e2745].

PI Substitution with Nevirapine could Improve Lipid Profile: Spanish Study

Protease inhibitors (PIs) are reportedly associated with metabolic complications and there is a trend to switch to simpler therapy to improve these disturbances. Gonzalez-Tome and others from the Division of Immunodeficiencies, Hospital 12 de Octubre, Madrid, Spain, have reported the effects in metabolic abnormalities in seven HIV-infected children, previously treated with protease inhibitor (PI) after switching to nevirapine. Seven children who were on a stable PI-containing regimen and a long drawn HIV-1 RNA load of <50 copies/ml were switched to nevirapine. All were naïve to NNRTIs. PIs were switched to nevirapine and pre-entry NRTIs were maintained. The substitution of PIs with nevirapine was made only when the patient showed hyperlipidemia or lipodystrophy or the physician and/or the patient showed willingness to simplify. Clinical, laboratory data and anthropometric parameters were assessed every 3 months. Dual-energy X-Ray absorptiometry scans were performed at baseline and at 12 months. Median age at the beginning of nevirapine was 120 months (99,177). Median decrease in cholesterol by 7.2 mmol/L was observed (P=0.09), from baseline to 12 months. HDL-cholesterol increased by 5.1 mmol/L (P=0.03) throughout the study period. No significant changes were observed in DXA with regard to body fat, but changes in total body bone mineral content and lean body content were significant. CD4 % remained stable. Except one patient all others maintained viral load <50 copies/ml at 12 months. The patient with virologic failure referred poor adherence. The study suggests that PI substitution with nevirapine could improve lipid profile although this strategy failed to show significant changes in body fat or lipodystrophy [Gonzalez-Tome MI, *et al.*, *BMC Infectious Diseases*. 2008;8(1):144].

Single Dose Fluconazole is Sufficient rather than a 14-day Course: Tanzanian Team

Thrush, is the most frequent warning sign that the immune system of a person infected with HIV has suffered a serious decline. It is an infection of *Candida* sp. in the mouth and upper throat above the pharynx, and occurs with increasing frequency when the CD4 count drops below 200 cells/mm³. The recommended treatment in many countries is a 14-day course of fluconazole at a dose of 150mg per day. However, a 14-day treatment course is problematic if the patient is on nevirapine, since fluconazole doubles nevirapine levels. This is particularly an issue if the patient is started on nevirapine, because nevirapine dosing has to be scaled up carefully after 14 days to avoid early toxicity. A study in Tanzania showed that a single 750mg dose of fluconazole is just as effective at curing thrush in the mouth and upper throat as a 14-day course of the drug at a lower dose of 150mg with median CD4 cell counts of 100 cells/mm³.

The study was performed on a group of 220 HIV-positive patients with a clinical and microbiological diagnosis of oropharyngeal candidiasis. They were randomised in equal groups to receive either a single 750mg dose of fluconazole (in a generic form manufactured by Shelys Pharmaceuticals) and then a placebo course for 14 days, or a 14-day course of fluconazole at 150mg once daily, plus a dummy dose of five placebo tablets on the first day of treatment. The primary study endpoints were clinical and mycological cure. After treatment was completed 94.5% of the single dose group and 95.5% of the single-dose group were clinically cured- a non-significant difference. Mycological cure was seen in 84.5% of the single dose group and 75.5% of the 14-day group (a non-significant difference). There was no significant difference in relapse rates between days 14 and 42 according to the study treatment. In addition, there was no significant difference in adverse events between the two treatment groups. Only one patient (taking nevirapine) experienced an increase in liver enzyme levels, which returned to normal after fluconazole treatment was completed. The investigators conclude by noting that single-dose therapy is cheaper than a 14-day course of treatment, and has the additional advantage that it can be given as a directly-observed treatment by medical personnel [Hamza OJM, *et al.*, *Clinical Infectious Diseases*. 47: 1270-6, 2008].

SPECIAL NEWS



Co-Discoverers of HIV-1 Awarded 2008 Nobel Prize for Medicine



Françoise Barré-Sinoussi



Luc Montagnier

French scientists Prof. Françoise Barré-Sinoussi of the Regulation of Retroviral Infections Unit, Virology Department, Institut Pasteur, France and Prof. Luc Montagnier, World Foundation for AIDS Research & Prevention Paris, France, were recognized for their groundbreaking work in uncovering the virus responsible for AIDS, the HIV-1. The Karolinska Institute announced that the two would share the 2008 Nobel Prize for Medicine.

More than 25 million people have died of HIV/AIDS since 1981 and an estimated 33 million more are living with HIV/AIDS. In 1983, Pr. Montagnier and Pr. Barré-Sinoussi, a member of his lab at the Institut Pasteur, Paris, published their report of a newly identified virus. The discovery led to diagnostic tests to detect the infection and subsequently to the development of anti-retroviral drugs that can prolong the lives of patients. The tests are now used to screen blood donations, making the blood supply safer for transfusions and blood products. The discovery has also led to an understanding of the natural history of HIV infection in people, which ultimately leads to AIDS and death unless treated. The French scientists were cited by the Karolinska Institute for identifying a virus they called LAV (now known as HIV) in lymph nodes from early and late stages of the infection.

The Nobel Prizes were created in the will of Alfred Nobel, the Swedish explosives inventor, who died in 1896. The first prizes were awarded in 1901.

CLINICAL TRIAL News

ACTG 5102 Treatment Interruption Sub-study

Treatment associated toxicities together with costs associated with ART led to the consideration of CD4 driven strategies for the management of HIV infection. Treatment interruption (TI) poses risks such as recrudescence HIV viremia and HIV disease progression. A sub-study was done in the setting of the ACTG 5102 trial to evaluate the metabolic changes associated with discontinuation of ART and the changes in immune activation markers, in order to identify changes in cardiovascular risk in this situation.

Forty-seven HIV-1-infected subjects on stable ART, with <200 HIV RNA copies/mL and CD4 cell count \geq 500 cells/ μ L were randomly assigned to continue ART for 18 weeks with or without 3 cycles of interleukin-2 (IL-2). After 18 weeks, ART was discontinued in all subjects until the CD4 cell count dropped below 350 cells/ μ L. By week 8, total cholesterol (TC), LDL, HDL cholesterol and triglycerides decreased. However the TC/HDL ratio remained unchanged. No change was observed in glucose and insulin levels. The rapid changes in lipid levels indicated that these effects were directly due to the medications, and not due to changes in body composition which would require a lengthier period of time. These initial lipoprotein changes were also unlikely to be related to HIV replication, as they occurred before the return of HIV viremia. After TI there was also a marked increase in immune activation and soluble TNFR2 coinciding with the rebound of HIV viremia. The study concluded that interrupting ART does not reduce cardiovascular disease (CVD) risk, as the improvements in lipid parameters are modest and overshadowed by the decreased HDL levels [Tebas *et al.*, *PLOS one* 2008 3:e2021].

HIV/STD Guidelines *New*

Adult Prevention and Treatment of Opportunistic Infections Guidelines Working Group. Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-Infected Adults and Adolescents [DRAFT]. June 18, 2008; pp. 1 - 289.
http://aidsinfo.nih.gov/contentfiles/Adult_OI.pdf

Adult Guidelines Committee. Antiretroviral therapy in adults, 2008.
J Southern Afr HIV Clinicians Soc, pp.18 - 31.

AIDS 2008: Update on Antiretroviral Therapy: Resistance Issues and Investigational Agents
<http://www.medscape.com/viewprogram/17490?src=nlcmealrt&spon=1&uac=91264FZ>

Antiretroviral Drug Resistance Testing in Adult HIV-1 Infection: 2008 Recommendations of an International AIDS Society–USA Panel. Hirsch MS *et al.*, *Clin Infect Dis*. 2008;47:266-85.

Antiretroviral treatment of adult HIV infection: 2008 recommendations of the International AIDS Society–USA Panel. Hammer S, Eron J, Reiss P, *et al.* *JAMA*. 2008;300: 555-570

CDC Recommendations for Opt-out Testing and Reactions to Unanticipated HIV Diagnoses, 2008.
Galletly CL, *AIDS Patient Care STDS*. 2008;22:189 - 93.

CDC (USA) Updated Guidelines on Managing Drug Interactions in the Treatment of HIV-related Tuberculosis, February 2008.
www.cdc.gov/mmwr/preview/mmwrhtml

European AIDS Clinical Society (EACS) Guidelines for the Clinical Management and Treatment of HIV-Infected Adults
HIV Med. 2008;9(2):65-71.

European AIDS Clinical Society (EACS) Guidelines for the Clinical Management and Treatment of Chronic Hepatitis B and C Coinfection in HIV-infected Adults
Clumeck N, Pozniak A, Raffi F. *HIV Med*. 2008;9(2):82 - 88.

Expanded HIV Testing in Nursing Care: Implementing the CDC Recommendations
<http://cme.medscape.com/viewarticle/572177>

Guidelines for use of antiretroviral therapy for HIV infected individuals in India (ART guidelines 2008)
Pujari S *et al.*, *J Assoc Physicians India*. 2008;56:339-48, 353-71

Guidelines Updated on Care for Sexually Assaulted Teens
Pediatrics. 2008;122:462-470.

Joint WHO/LO guidelines on Post-Exposure Prophylaxis to Prevent HIV Infection, March 2008.
www.who.int/hiv/pub/guidelines/PEP/en/index.html

NACO - Operational Guidelines for Community Care Centres, January 2008.
www.nacoonline.org/upload/Publication/Treatment%20Care%20and%20support/Guidelines%20for%20Community%20Care%20Centre%20-.pdf

NACO - Operational Guidelines for Programme Managers and Service Providers for Strengthening STI / RTI Services, April 2008.
www.nacoonline.org/upload/Basic%20Services/STI%20Operational%20Guidelines_Oct%202007.pdf

NACO - Standards for Blood Banks and Blood Transfusion Services.
<http://www.nacoonline.org/upload/Final%20Publications/Blood%20Safety/Standards%20for%20Blood%20Banks%20and%20Blood%20Transfusion%20Services.pdf>

NACO-Manual on Quality Standards for HIV Testing Laboratories.
<http://www.nacoonline.org/upload/Blood%20Safety/Manual%20on%20Quality%20Standards%20for%20HIV%20Testing%20Laboratories.pdf>

NACO-Guidelines for Setting up Blood Storage Centres.
<http://www.nacoonline.org/upload/Final%20Publications/Blood%20Safety/Guidelines%20for%20Setting%20up%20Blood%20Storage%20Centres.pdf>

NACO-National Guidelines for the Enumeration of CD4 T-Lymphocytes
<http://www.nacoonline.org/upload/Blood%20Safety/CD-4.pdf>

NIH (USA) Antiretroviral Guidelines for Adult and Adolescents. Guidelines for the Use of Antiretroviral Agents in HIV-1-infected Adults and Adolescents. Department of Health and Human Services (DHHS), January 2008; 1 - 128.
<http://www.aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf>

NIH (USA) Antiretroviral Guidelines for Pediatric. Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection (DHHS), February 2008; 1 - 141.
<http://aidsinfo.nih.gov/contentfiles/PediatricGuidelines.pdf>

NIH (USA) Adults and Adolescents Antiretroviral Treatment Guidelines Panel's Communication Regarding Abacavir (DHHS), April 2008.
<http://aidsinfo.nih.gov/contentfiles/ABCComm.pdf>

Panel on Antiretroviral Guidelines for Adult and Adolescents. Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. DHHS. January 29, 2008; pp. 1 - 128. <http://www.aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf>

Pennsylvania Medicaid Adult HIV Clinical Practice Guideline, 2008 – 09.
www.accessplus.org/downloads/WhatsNew/HIVGuidelines_2008-2009.pdf

SHEA/APIC Guideline: Infection Prevention and Control in the Long-Term Care Facility, July 2008
<http://www.journals.uchicago.edu/doi/pdf/10.1086/592416?cookieSet=1>

Updated British guidelines for the care and treatment of HIV-positive pregnant women.
HIV Med. 9: 452 – 502

Update of the drug resistance mutations in HIV-1
Johnson V, Brun-Vezinet F, Clotet B, *et al.* *Topics HIV Med*. 2008; 16:62-8.

Updated Guideline for Occupational Postexposure Prophylaxis for HIV, 2008.
Landovitz RJ. *AIDS Clin Care*. 2008; 20:15.

U.S. DHHS. Panel on guidelines for adults and adolescents. Updated guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. January 29, 2008.
<http://aidsinfo.nih.gov/>

Working Group on Antiretroviral Therapy and Medical Management of HIV-Infected Children. Guidelines for the Use of Antiretroviral Agents in Pediatric HIV Infection. July 29, 2008; pp. 1 - 134.
<http://aidsinfo.nih.gov/ContentFiles/PediatricGuidelines.pdf>

Working Group on Guidelines for the Prevention and Treatment of Opportunistic Infections among HIV-Exposed and HIV-Infected Children. Guidelines for Prevention and Treatment of Opportunistic Infections in HIV-Exposed and HIV-Infected Children [DRAFT]. June 20, 2008; pp. 1 - 250.
http://aidsinfo.nih.gov/contentfiles/Pediatric_OI.pdf

FUNDING OPPORTUNITIES

Centers for Disease Control and Prevention - Addressing Emerging Infectious Diseases in the Republic of India.
<http://www.grants.gov/search/search.do?&mode=VIEW&flag2006=true&oppld=17307>

Comprehensive Resources for HIV Microbicides and Biomedical Prevention RFP- NIAID-DAIDS-NIHAI2008036
https://www.fbo.gov/spg/HHS/NIH/NIAID/RFP_NIAID-DAIDS-NIHAI2008036/listing.html

Gates Foundation - 104 Grants for Novel Ideas for Global Health
Scientists from Diverse Set of Disciplines and Regions Receive \$100,000 Each to Explore Bold, Untested Projects
<http://www.gcgh.org/about/Newsroom/Pages/GCERound1Grants.aspx>

Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) Round 8.
<http://www.theglobalfund.org/en/apply/call8/>



Rapid HIV Point-of-Care Diagnostic Device for Resource-Limited Settings

<https://www.fbo.gov/spg/HHS/NIH/NIAID/BAA-NIAID-DAIDS-NIHAI2008027/listing.html>

The University of Georgia - International Public Service and Outreach (UGA-IPSO).

<http://www.uga.edu/internationalpsop/grants.html>

US-NIH Grant Announcements: Visit <http://www.grants.gov/search> for the following new grant announcements:

- Using Proven Factors in Risk Prevention to Promote Protection from HIV Transmission (R01)
- Basic HIV Vaccine Discovery Research (R01)
<http://grants.nih.gov/grants/guide/notice-files/NOT-AI-09-007.html>
- The Interaction of HIV, Drug Use, and the Criminal Justice System (R01)
- Investigations on Primary Immunodeficiency Diseases (R01)
- Highly Innovative Tactics to Interrupt Transmission of HIV (HIT-IT) (R01)
- Integrating Biobehavioral and Sociocultural Research to Prevent HIV Transmission and Infection (R21)
- Exploratory/Developmental Investigations on Primary Immunodeficiency Diseases (R03).
- International Research in Infectious Diseases Including AIDS (IRIDA) Program (R01)
- Comprehensive Alcohol Research Center on HIV/AIDS (P60)

**Upcoming Events
2008/09**

November '08

9th International Congress on Drug Therapy in HIV infection, November 9 – 13, 2008, Glasgow, Scotland, UK.
www.hiv9.com

International Association of Physicians in AIDS Care (IAPAC), New Orleans, November 30 - December 2, 2008.
<http://www.iapac.org/IAPAC08/IAPAC08-programme.html>

2008 World AIDS Day Conference, November 30, 2008, New York City, New York, United States <http://www.wadnyc.org>

December '08

Epidemics. The First International Conference on Infectious Disease Dynamics, December 1 – 3, 2008, Asilomar on the Californian Shores of the Pacific Ocean, USA. <http://www.epidemics.elsevier.com/>

American Society of Health-System Pharmacists (ASHP) Meeting, December 7 – 11, 2008, Orlando, FL, USA.
www.ashp.org

SAARC Second Conference on Tuberculosis, HIV/AIDS and Respiratory Diseases, December 15 – 18, 2008, Kathmandu, Nepal.
<http://www.saarctb.com.np>

4th International Workshop on Targeting HIV Entry, 8 - 9 December 2008, Rio Grande, Puerto Rico.
<http://www.virology-education.com/>

January '09

12th Bangkok International Symposium on HIV Medicine, HIV Netherlands Australia Thailand Research Collaboration (HIV-NAT), January 14 – 16, 2009.
<http://www.hivnat.org>

Frontiers in Immunology Research 2008 International Conference 2009, January 8 – 11, 2009, Acapulco, Mexico.
<http://www.firnweb.com/FIRNCalls.htm>

CART 2009, January 9 – 10, Chennai, India.
www.yrgcare.org

2nd National Conference on HIV/AIDS Therapy, 10th & 11th January 2009, Mumbai, India
http://www.hhrfonline.com/2aids_conf.php

March '09

7th European HIV Drug Resistance workshop, March 25 - 27, 2009, Stockholm, Sweden
<http://www.virology-education.com/>

2nd International Workshop updates on HIV and related co-infections, March 4 - 6, 2009, Venice, Italy.
HIV-Venice@hrgworldwide.com

Prevention of HIV/AIDS (X3), March 22 - 27, 2009, Keystone Resort, Colorado
<http://www.keystonesymposia.org>

HIV Immunobiology: From Infection to Immune Control (X4) - joint with X3, March 22 - 27, 2009, Keystone Resort, Colorado
<http://www.keystonesymposia.org>


April '09

10th International Workshop on Clinical Pharmacology of HIV Therapy, April 15 - 17, 2009 - Amsterdam, Netherlands
<http://www.virology-education.com/>


June '09

5th International HIV and Hepatitis Co-infection workshop, June 4 - 6, 2009 - Lisbon, Portugal.


**YRG CARE
Forthcoming Academic Programmes**

 **PhD Degree Course**

Applications for PhD degree course (affiliated to the University of Madras) at YRG CARE are invited from candidates who have completed their Post Graduate degree in Medical Microbiology/ Applied Microbiology/ Molecular biology/ Biotechnology. Applicants should have passed the national entrance tests for independent fellowships under CSIR /ICMR/ DBT.

 **Chennai ART Symposium (CART 2009)**

YRG CARE is conducting a 2 day symposium on HIV Therapeutics on 9th and 10th, January 2009 for clinicians involved in HIV care, and for young clinicians who are keen to learn about HAART. The symposium will be conducted by world - renowned clinicians and researchers. Venue: Chennai; Registration fees: Rs.1500 for delegates and Rs.1000 for students. Those interested to participate may contact the Organizing Chair – Dr. N. Kumarasamy (kumarasamy@yrgcare.org) and the coordinator Mr. K.G. Kosalaraman (kosal@yrgcare.org).

 **HIV SCIENCE 2009**

The Second Annual Science Symposium on HIV/AIDS will be organized by YRG CARE in Chennai (dates to be announced soon). The annual HIV symposium will bring together leading faculties/experts/scientists to provide updates on HIV/AIDS. This symposium will cover various topics related to HIV epidemiology, pathogenesis, host-HIV interactions, immune responses to infection, disease progression, opportunistic infections, current treatment strategies, natural history of HIV disease in India, vaccines, sexually transmitted diseases, and co-infections with TB and hepatitis viruses. This will provide a forum for young people to address key scientific issues and gaps in knowledge and, will also be an opportunity to identify priorities for future action to fight against HIV/AIDS. The symposium is focused for young professionals including the post-graduate students from medical, para-medical, science colleges/universities/ research institutions. For more details please visit www.yrgcare.org or write to us.



HIV SCIENCE 2008: A Platform for Nurturing Science Research on HIV/AIDS Concludes Successfully

HIV SCIENCE 2008, the First Annual Science Symposium on HIV/AIDS was held on 22nd and 23rd of September 2008 at the Vigyan Auditorium, SERC, Council of Scientific and Industrial Research (CSIR) campus, in Taramani, Chennai.

HIV SCIENCE 2008 was sponsored and co-sponsored by YRG CARE, the Department of Biotechnology, New Delhi, Indian Council of Medical Research (ICMR), New Delhi and Tamilnadu State Council for Science and Technology (TNSCST)/National Council for Science & Technology Communication (NCSTC), New Delhi.

Around 300 participants from various states and a scholar from Tanzania participated in the symposium. Eighteen participants were awarded scholarship to encourage participation. The inaugural ceremony was presided by Mr. Subbaraj, IAS (Health Secretary to the Government of Tamilnadu), and Ms. Supriya Sahu, IAS (Project Director, Tamilnadu State AIDS Control Society, Chennai) released the proceedings. This was followed by scientific sessions and speakers from diverse areas of HIV/AIDS research, from YRG CARE, National AIDS Research Institute (Pune), ICMR (New Delhi), AIIMS (New Delhi), and various other research institutions from all over India delivered scientific lectures on HIV/AIDS. Besides, there was a tele-presentation by an international speaker from Emory University, Atlanta, USA.



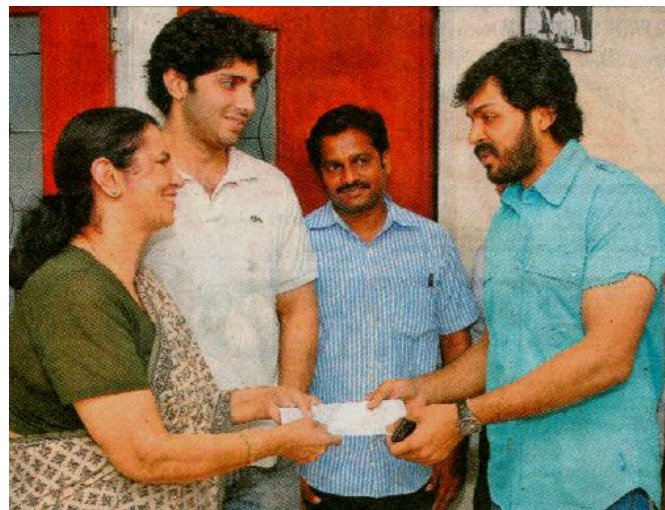
Photograph: (left to right) Dr. Ramesh Paranjape, Director, National AIDS Research Institute (NARI), Pune, Prof. Suniti Solomon, Director, YRG CARE, Dr. K. G. Murugavel, Organizing Secretary, HIV SCIENCE 2008, Mr. VK Subbaraj, IAS, Health Secretary, Government of Tamilnadu and Ms. Supriya Sahu, IAS, Project Director, Tamilnadu State AIDS Control Society are seen in the picture.

YRG CARE on the Avenue to Greenways

To mark the successful conclusion of the First Annual Science Symposium on HIV/AIDS held on 22nd and 23rd of September 2008, the Organizing Chair and Director of YRG CARE planted saplings at the premises of YRG CARE, VHS Hospital in Taramani, Chennai. This is also an initiative by YRG CARE's response to the recent emergence of various reports of threats of global warming.



Actor Karthi for a Good Turn to HIV Infected Children



Thespian Tamil actor Mr. Sivakumar's son Karthi (extreme right) celebrated his birthday by generously donating for the improvement of amenities of HIV positive children at YRG CARE Medical Centre. (In the picture) Prof. Suniti Solomon and Dr. Sunil Solomon are receiving a cheque worth Rs. 50,000/- from Mr. Karthi.

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January – August 2008

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Ask the Experts

Readers are invited to send their queries on HIV/AIDS, which will be answered by experts from YRG CARE.

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