viruses and other pathogens in KNP's staff requires implementation of a long-term surveillance programme.

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## Diversity of novel arenaviruses in South Africa

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**Background**: Arenaviruses are hosted by Murid rodents in the *Murinae* and *Sigmondontinae* subfamilies. They are divided into two serocomplexes; Tacaribe containing viruses hosted by New World rodents, and the Lassa-Lymphocytic choriomeningitis complex containing various arenaviruses hosted by African rodents, the ubiquitous LCMV and Dandenong virus from Australia. While non-pathogenic in rodents, some arenaviruses are highly pathogenic for human beings: In Africa, these are Lassa fever virus hosted by *Mastomys natalensis* and endemic to West Africa and Lujo virus with an unknown host that emerged in Zambia and caused a nosocomial outbreak in South Africa.

**Methods & Materials**: In this study South African rodents were screened for arenaviral RNA sequences. A total of 1648 small mammals representing 16 different genera were trapped at various locations in 8 provinces in South Africa between 2008 and 2012. RNA extracted from lung tissue was tested using broadly reactive RT-PCR assays targeting the *L* gene. The positive samples were amplified using PCR assays targeting the GPC and NP genes, which were then used for phylogenetic analysis.

**Results**: Thirteen novel arenavirus sequences were identified in four different rodent species indigenous to Southern Africa. Phylogenetic analysis showed that these arenaviruses belong to different clades; 3 outliers of the Lassa-Mopeia clade and 10 forming a monophyletic clade with Merino Walk virus, only very recently described from *Myotomys unisulcatus* from the Eastern Cape.

**Conclusion**: A surprisingly high diversity of arenaviruses was detected in this study and further characterisation efforts are ongoing. The identification of arenaviruses by our group and others in Southern Africa suggests that they are more widely distributed than previously thought. The distribution and pathogenicity (or not) for humans is yet to be defined. The outbreak of Lujo virus in 2008 is a reminder that there may be horrible surprises out there.

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# Cancer risk evaluation: Preliminary analysis of inflammatory biomarkers in farmers exposed to zoonotic agents

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**Background**: The majority of emerging diseases are zoonoses and surveillance programs of animals for zoonotic pathogens are a global challenge. Notably, previous studies of individuals occupationally exposed to animals have suggested an increased risk of cancer, especially hematopoietic malignancies, which may be related to their exposure to a variety of infectious agents, showed an elevated risk of lung cancer for poultry exposure in subjects ever had direct contact with chicken blood. Cancer risk associated with specific types of farm animals or specific etiologic agents have not been clearly described. It is hypothesized that chronic infection by several infectious agents are associated with human cancer risk and co-morbidities.

The aim of the present study was to organize a cohort study with the long range goal to analyse the association between infectious agents and bio-molecular markers in a fraction, randomly selected, of both human and animal samples derived from a cohort of farmers.

**Methods & Materials**: Subjects included in the cohort are 12,600 workers from 4311 farms located in Catania and Ragusa area. The total number of 7,754,704 animals raised in the farms comprises poultry, cattle, sheep and hogs. Peripheral blood samples from both workers and animals were collected during the health survey program, according to the current rule. For the risk evaluation (odds ratio), all workers, with a history of chronic diseases or positive for infectious agents were considered as "cases", the remaining subjects were considered as "controls".

**Results**: Preliminary data on the analyses of biomarkers, such as interleukin-6, interferon-alpha, beta, osteopontin and matrix metalloproteinase-9, performed by standard procedures in a group of human samples, reveals higher levels of these markers in subjects with a history of pulmonary and liver chronic diseases compared with other workers. Intriguingly, the history of such infections may be associated with work exposure.

**Conclusion**: The identification of bio-markers and zoonoses could contribute to translational research by supporting clinicians for the development of tailored therapies. Furthermore, early detection of infectious agents could be of great relevance to public health in terms of: a) reduction of infection diseases and infection-related diseases; b) reduction of costs associated to patients' monitoring.

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