More Coronaviruses

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Despite extensive laboratory investigations in patients with respiratory tract infections, no microbiological cause can be identified in a significant proportion of patients. In the past three years, several novel respiratory viruses, including human metapneumovirus, SARS coronavirus and human coronavirus NL63, were discovered. Another novel coronavirus, coronavirus HKU1 (CoV-HKU1), was detected from a 71-year old man with pneumonia, who had just returned from Shenzhen, China. Quantitative RT-PCR showed that the amount of CoV-HKU1 RNA were 8.5 to $9.6x10^6$ copies per ml in his nasopharyngeal aspirates during the first week of the illness and dropped progressively to undetectable levels in subsequent weeks. He developed increasing serum levels of specific antibodies against the recombinant nucleocapsid protein of CoV-HKU1 with IgM titers of 1:20, 1:40 and 1:80 and IgG titers of <1:1000, 1:2000 and 1:8000 in the first, second and fourth weeks of the illness respectively. Isolation of the virus using various cell lines, mixed neuron-glia culture and intracerebral inoculation of suckling mice was unsuccessful. The complete genome sequence of CoV-HKU1 is a 29926-nucleotide, polyadenylated RNA, with G + C content of 32%, the lowest among all known coronaviruses with available genome sequence. Phylogenetic analysis reveals that CoV-HKU1 is a new group 2 coronavirus. Retropective screening of nasopharyngeal specimens negative for SARS-CoV, from patients with respiratory illness during the SARS period identified the presence of CoV-HKU1 RNA in another 9 patients with pneumonia. Our data support the existence of a novel group 2 coronavirus associated with pneumonia in humans. (from Journal of Virology, accepted and in press)