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## Rhinovirus Infection is Influenced by Atmospheric Conditions and Polymorphisms in Tollip and IL6 Genes

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Rhinoviruses are picornavirus with over 150 serotypes and 3 species. Although usually causing common colds, in Asthma, COPD and elders it may cause life-threatening disease. Transmission routes are controversial, but may involve human-to-human and indirect transmission. Thus both environmental and genetic susceptibility factors may play a role in rhinovirus epidemiology.

In the present study we evaluated the seasonality of rhinovirus in Portugal and the role of air-borne virus, atmospheric parameters and Immune-system related genetic variations (TOLLIP rs5743899, IL6 rs1800795, IL1B rs16944, TNFA rs1800629).

Blood samples and monthly nasal swabs were collected from 89 volunteers. Weekly outdoor and indoor air samples were collected. Daily atmospheric parameters were collected from the FP-ENAS meteorological station and the public air quality monitoring infrastructure. DNA and RNA were purified with Qiagen column based kits. Viral RNA was quantified by RTqPCR on Lightcycler 1.1 (Roche; 4). Polymorphisms were genotyped by PCR-RFLP.

Nasal Rhinovirus frequency peaked in November. No indoor-air samples showed rhinovirus. Outdoor air samples showed rhinovirus presence in concordance with the nasal samples. TOLLIP and IL6 polymorphisms (but not IL1B and TNF) were found to influence rhinovirus nasal detection: TOLLIP-G individuals were more often year-long rhinovirus free; IL6-C individuals showed higher rhinovirus titres. Wind Speed, Radiation, Atmospheric pressure, SO<sub>2</sub>, PM<sub>10</sub>, PM<sub>25</sub> and benzene levels were found to influence the presence of nasal rhinovirus.

**Conclusions:** Air-borne rhinovirus correlates with human infection. This may be influenced by viral stability due to atmospheric conditions. Additionally, genetic factors influence both susceptibility to infection (TOLLIP gene) and viral clearance (IL6 gene).

### Biography:

José Cabeda has completed his PhD in 1996 from the University of Oporto. He was an assistant Professor at Universidade do porto from 1999-2001, has directed the Molecular Biology Diagnostic Unit of Centro Hospitalar do Porto (1999-2009), and has been CEO at Genefadi, a small Biotech company in Oporto. He is currently an Associated Professor at Universidade Fernando Pessoa, Porto, Portugal where he has been a teacher from 2001. He has published 36 papers in indexed journals, 4 book chapters and 2 books in the areas of molecular diagnostic and infection epidemiology.