



**Mês de: Maio 2011**

## **BIOMATEMÁTICA**

**Dia 17 de Maio (terça-feira), às 16h, na Sala B3-01**

“A new hypothesis to explain influenza mortality  
during the 1918 influenza pandemic”

*Cristina Paulo*

(University of Minho, Braga / Gulbenkian Inst. Cience)

### **Abstract:**

It is widely accepted that the increase in the mortality rate during the second wave of the 1918 influenza pandemic was due to genetic change of the influenza virus towards a more virulent one.

But the time between the two waves was too short to explain how the virus had spread worldwide in a way that the second wave was almost synchronized all over the world.

Based on animal experiments, where the infectious dose of influenza A virus was associated to the severity of disease, we propose that the increase in the case-fatality rate can be explained by the dynamics of disease and by a dose-dependent response mediated by the number of simultaneous contacts a susceptible person has with infectious ones.

We illustrated the hypothesis by using a compartment model with seasonality, waning of immunity and a Holling type II function, to model simultaneous contacts between a susceptible person and infectious ones. In light of our hypothesis, non-pharmaceutical measures may be more important to reduce case-fatality rates than morbidity.

Implementation of such interventions spreads the epidemic into a longer period, decreasing the number of infectious persons at each time, and consequently, decreasing the number of severe influenza cases among healthy people and overall mortality.

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Local:  
**COMPLEXO INTERDISCIPLINAR**  
Av. Prof. Gama Pinto, 2  
1649-003 Lisboa

