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Towards a "Universal influenza vaccine": Principles and approaches

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Influenza viruses master the immune evasion by constantly changing their antigenic load and virulence during the interaction with the host or transition between avian and mammalian species. Several pandemic outbreaks of influenza A viruses have resulted in a massive loss of human lives around the globe. In USA alone, seasonal influenza kills 30,000-50,000 people by acute pneumonia in a non-epidemic year. Vaccination is the major preventive strategy against influenza infection, though it does not guarantee full protection and it is restricted by age and a number of medical conditions. In addition, preparation of conventional inactivated viruses (CIV) vaccines is a lengthy process that can end up in a shortage of flu vaccines. Thus, therapeutic flu antibodies appear to be a better choice.

Due to high versatility and obvious advantages over the conventional drugs (e.g. safety and efficacy), today's 90% of therapeutic monoclonal antibodies (mAb) are marketed (with total revenue of $40.15 bn only in 2010) for the treatment of cancer and autoimmune disorders. Generation in our labs of a new HLA-humanized mouse able to reconstitute a functional human immune system that responds efficiently to vaccination and flu infection, has advanced our concept of human anti-influenza virus mAbs (HAIVA) as a potential "universal" flu vaccine and therapeutic in the seasonal and eventual flu pandemics. Principles and approaches to reaching this goal will be discussed.

Biography

Teodor-D. Brumeanu earned the M.D. degree from Carol Davila School of Medicine, Bucharest, Romania, and completed his postdoctoral training in immunology/immunochemistry in University of Manitoba, Canada and Mount Sinai School of Medicine, New York. He is currently Professor of Medicine at USUHS, Bethesda.

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