

4<sup>th</sup> International Conference on

# Clinical Microbiology and Microbial Genomics

October 05-07, 2015 Philadelphia, USA



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## One health: Animals, humans and our globe, our mega-organism

We evolved to conquer and emerged with a concept that we were the focus of our environment, our world. The concept was doomed from the start and our disruption of the world we live in has forced us to re-evaluate our position, recognizing that there are 3 parts (Humans, Earth/Environment and Animals) and we collectively address Newton's third law of Motion: For every action there is an equal and opposite reaction. Thus, balance or one health and its intrinsic buffering capacity is the key and humans have been collectively "Multi- Disruptive", particularly the untoward consequences of antibiotics. Human population will approach 9 billion shortly and with it an increase in low socio-economic habitat (Global Slums) with increased potential for disease transmission, so evident in the most recent Ebola episode in Africa. Old and new routes of emerging pathogens will be unmasked, perhaps 2-4 new ones per year. Animal diseases, zoonosis, particularly viral, will predominate as we realize that most global recent diseases have had an animal vector; over the last 3 decades approximately 75% of human diseases and have come from or through wildlife. Perhaps most significant will be the unpredictable impact of global warming, climate change and the subsequent increased range of vector-borne diseases and the pollution of water, a potential for wars. Microbes are central to all three and the unbalance now provides the opportunity for the "Perfect Microbial Storm". There is 'No Health Sanctuaries' as humans have "collapsed their space" with animals and the environment/earth. Fungi offer a unique view as they encompass more animals/plants in a deadly fashion. Proactive surveillance is key-based on global collaboration using tools like Google Earth and GIDEON to maximize rapid computer inter-face and global diversity. New laboratory tools, like BARDOT, laser light scatter identification need incorporation to link international microbial libraries and unmask the other threatening potential, bioterrorism.

## Biography

John G Thomas is recognized as an "International Educator and Global Microbiologist"; being lectured in more than 43 countries while a Clinical Microbiologist in Pathology, Dentistry and Medicine for 51 years. His research emphasizes bio-films and medical devices including endo trachs and the connection between oral diseases, VAP and wound infections ("Intellectual Design") with the recent integration of micro 3-D- bio printing using bio-plastics and unique prebiotics (Therapeutic Bacteria) for intervention. He has over 50 publications, multiple book chapters, significant grant support, pending patents and over 100 posters/abstracts at national and international meetings. His sabbatical at Cardiff University, Wales, UK (2007) was a driving influence. He has been a member of the ADA Scientific Advisory Committee for the last 8 years. As Faculty at 6 Universities during his career, he has received Alumni and University awards for research and International Student Mentoring; retiring from WVU in 2013 after 23 years as Professor Emeritus, he presently is expanding his research/teaching utilizing the advanced resources of the Allegheny Health Network in Pittsburgh, PA, Carnegie-Mellon University and Mass. Gen. Hospital, Boston, MA.

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