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On the Importance of Innate and Adaptive Mucosal Immunity in Respiratory Tract and Gastrointestinal Tract Infections

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This article discusses the basic immunological evidence on why the "Jab in the Arm" vaccines rolled out for COVID-19 could not provide protection or prevent transmission of COVID-19 or any other similar type of infections (viral, bacterial) that enter via the oral nasal portal of entry and cause disease in the respiratory and gastrointestinal tracts. We became concerned about this basic flaw in vaccine design and delivery early in the vaccine roll out (Lindley and Steele 2021, Gorczynski et al 2021) as did others (Xaio et al 2021, Oh et al 2021, Russell and Mestecky 2022) and very recently so has Dr Anthony Fauci and his colleagues who have completely reversed their assessment of all the vaccine mandates and now conclude the public health response was a complete failure (Morens et al 2023) requiring a re-evaluation of all human vaccine development and delivery in the future for cold and flu infections of the respiratory tract.

Many years ago (1970-1975) I did my PhD with Professor Derrick Rowley in the Department of Microbiology, University of Adelaide where my thesis was entitled "Efficiency of Antibody Classes in Cholera Immunity" (Steele 1975). I was set the task to isolate the three main classes of antibodies those in blood such as IgM, IgG and secretory IgA in mucosal fluids specific for the surface antigens of *Vibrio cholerae* the causative water borne bacterial infection causing severe diarrhea disease. The sources I used for isolation were blood serum (IgM, IgG) and for secretory IgA the early milk or colostrum from pregnant mothers (rabbits) as well as intestinal fluids. Pregnant and lactating systemic immunised mothers produce dimeric secretory IgA in their breast colostrum to deliver to their baby highly avid (strong binding) mucosal localised IgA antibodies. Thus, on suckling, a type of 'anti-septic' paint develops along the mucosal epithelial lining allowing protection against a diverse range of oral-nasal entry pathogens – the range which the baby's mother has encountered during pregnancy. In that 5 year study I never really achieved induction of high levels of mucosal secretory IgA antibodies in the mucosal fluids via the systemic or intramuscular route of vaccination (that is "Jab in the Arm") apart from colostral sIgA in pregnant and lactating immunised mothers. The only successful route to stimulate sIgA in the gastrointestinal fluids

was by oral immunization of live and dead micro-organisms or cholera vibrios (Steele et al 1974). These early findings on the importance of local mucosal application of antigens (protein and carbohydrate structures and molecular patterns) displayed on the surface of viral and other microbial pathogens were widely confirmed by many other investigators working in the mucosal immunology field at that time (Steele 1975, and see the modern updates of Russell and Mestecky 2022, Morens et al 2023). It was an empirical fact that entered the medical and immunology textbooks about 40 or so years ago. I myself lectured third year immunology students on this while I was at the University of Wollongong (1985-2000). That system of local mucosal immunity is activated differently to what might popularly be described as 'blood' immunity (systemic immunity or parenteral immunity) and the immunity so stimulated was named and identified as GALT immunity, of the gut associated lymphoid tissue.

This is the main reason why any type of systemic 'Jab in the Arm' vaccine *cannot work* against protecting the mucosal surfaces of the respiratory tract from all types of colds and flus. Thus, all attempts at so called annual 'Flu shots' by 'Jab in the Arm' of the past 40 or so years have also been useless and futile exercises - the protective unreliability of such Flu shots has been an open secret for many years (Osterholm et al 2012).

Over the years this typical human folly never really worried me as I *wrongly* thought all such shots were *both* ineffective *and* harmless (that is, they might be totally useless but at least they were thoroughly safety tested before injecting into human beings). That has all now been overturned of course by the very high adverse event rate of the novel mRNA lipid nanoparticle (LNP) vaccines and related expression vector vaccines – they are > 100x more dangerous than all previous vaccines of past 30 years combined (which were typical subunit protein shots in adjuvant). There is a voluminous online literature on this, for example see the exhaustive analysis and review by Dr. Phillip Altman a Clinical Trial and Pharmaceutical Regulatory Affairs Consultant (Altman 2022) – the scales were lifted from my eyes, so to speak, I was living in a type of 'La- La Land'.

As a molecular and cellular immunologist involved at various stages in experimental vaccine research and their aluminium adjuvants (Cooper and Steele 1991, Cooper et a 1991) I am now very sceptical indeed *of all types of human and animal vaccination*, especially vaccination of young human babies in the first year of life where the *number of shots* of all vaccine specific types is *causually* , that is positively *correlated* (termed regression) with the *increased incidence* of sudden infant death syndrome, or SIDS across 30 countries with reliable public health data (Miller and Goldman 2011). And this skepticism of mine was hardened after carefully reading Dr Judy Wilyman's classic 2015 PhD thesis (over 400 pages)

on her critical analysis of vaccines and vaccine public health policy in Australia and many other countries, especially the USA (Wilyman 2015). I strongly urge all interested people with an open mind to read Wilyman's work to find out more about the serious drawbacks of all public health mandated vaccine programmes of the past 40-50 years (Steele 2022a).

So, we now know why the "Jab in the Arm" *has not protected* anyone anywhere from COVID-19 during the vaccine roll out (Subramanian and Kumar 2021). For those interested readers I released a video lecture in 2021 during the vaccine rollout of COVID -19 pandemic discussing this manifest public health failure (https://youtu.be/Ijc4mjiIquk)- and why the "Jab in the Arm" could not protect against COVID-19 nor stop severity nor transmission- but that mucosal secretory IgA acquired by natural infection in recovered patients can be very protective.

This now leads obviously into the key issue of the level of lethality – or *virulence*- of COVID-19. Who are the vulnerable group in our community? It became very clear as the pandemic was unfolding first in China January 2020 then elsewhere that the vulnerable group could be identified as the Immune Defenceless Elderly Co-Morbids (median age 84 yr, Victoria, Australia in 2020 in aged care and nursing homes, Lindley and Steele 2021). We estimate that >99% of the healthy population of all ages gets rid of this virus rapidly via their immediately reactive evolutionary determined *Innate Immune* mechanisms treating it like the 'common cold' – our estimate is that about 0.1% of all those exposed to COVID-19 may die in a respiratory crisis if not treated properly with respiratory crisis therapies - a scenario that unfolded in Victoria Australia on a dramatic scale (Lindley and Steele 2021, Steele et al 2021). Thus > 99% scoring positive for COVID-19 by PCR tests (most likely very high cycle number detections, see Steele 2022b) can be classed as asymptomatic or cases of mild 'common cold'. *No one in government-controlled public health running the mandated public health response wants to hear this cool objective assessment*. However, we can now say that Dr Anthony Fauci now fully admits the mandated vaccine roll out has been a public health failure (Morens et al 2023, and see my far stronger public comments on his recently published paper, Steele 2023).

So then, how important is Innate Immunity in relation to infection-induced or vaccine-induced and Adaptive Immunity for Respiratory and Gastrointestinal Infections? Innate Immunity is the first line of cellular defence in *all* healthy cells in the first 24- 48 hrs of any pathogen infection, and mucosal epithelial cells are no different to all other healthy cells and tissues in the body. This 'genetic determined' immediately-reactive capacity has been handed down to us by our evolutionary ancestors over millions of years of Darwinian natural selection. When a healthy cell encounters a virus or bacterial pathogen interacting with its

surface, or trying to enter the cell, a very large defence against *all aspects* and stages of pathogen life cycles is unleashed within the cell, involving possibly a 1000 Interferon Stimulated Gene (ISG) products (Schoggins and Rice 2011, Schneider et al 2014). This ISG defence process is defective in Immune Defenceless Elderly Co-Morbids (Lucas et al 2020).

If a viral pathogen gains some replicative traction within the cell and begins actually replicating than an Adaptive Immune response may ensue in healthy subjects within 5-7 days, in the mucosal lymphoid cells of the epithelial lining involving production of dimeric secretory IgA (by local mucosal B lymphocytes) and then later anti-viral cellular responses involving local mucosal cytotoxic or "killer" T lymphocytes targeted to those specific cells replicating the virus. Many of these effects have been rapidly confirmed for COVID-19 in genetically defined experimental systems such as inbred mice (Oh et al 2021, Xiao et al 2021, Afkhami et al 2022). These studies also hold out promise for all future vaccines against really dangerous pandemic respiratory and gastrointestinal infections in the future, via a phenomenon now documented as mucosal exposure of 'Trained" or "Elevated" Innate Immunity by prior natural infection or local treatments (Netea et al 2020) as shown clearly by Xiao et al (2021) i.e. prior mucosal infection with COVID-19 can be protective in a completely non-specific way against, say, unrelated Influenza viruses (and *vice versa*).

Finally, dimeric secretory IgA has additional immune benefits. It does not "fix" or activate the Complement (C) cascade – that is, it does not excite the dangerous "cytokine storms" associated with the inflammatory C- activating 'blood' IgG antibodies (which are induced routinely by 'Jab in the Arm" vaccination). Natural immune production of secretory IgA can thus bind avidly to COVID-19 virus particles in say the bronchial epithelium and thus act as a powerful C blocker of the IgG inflammatory antibodies coming in from the blood system - thus prior secretory IgA response protects against the bronchitis inducing inflammatory cytokine storms caused by IgG-COVID-19 complexes in lung capillaries. Thus, naturally produced secretory IgA can help damp down the often dangerous pneumonia and bronchitis.

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All our work on understanding the origin and spread of COVID-19 including vaccine efficacy and safety is published in a recent book of our curated papers, as well as key papers 2018-19 just prior to COVID-19 (Wickramasinghe et al 2022); and in a overview of the COVID-19 pandemic (Steele et al 2022), including publications and URL links of many interviews at my website at https://independent.academia.edu/EdwardJSteele

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