

# DENISA RENSEN

Denisa Rensen | Age Reversal Expert, Longevity & Lifestyle Boutique Medicine, CEO Blissdesigned™, Medical Director StemaId™ Institute. Designer Of Ageless & Blissdesigned Salons, Programs On Optimal Living, Consciousness Expansion And Futurism. [WWW.DENISARENSEN.COM](http://WWW.DENISARENSEN.COM) | [WWW.BLISSDESIGNED.COM](http://WWW.BLISSDESIGNED.COM)



# PHILOSOPHY OF IMMUNOLOGY: DECONSTRUCTING THE IMMUNE SELF IN TRANSHUMAN TIMES

BY DENISA RENSEN

“When we try to pick out anything by itself, we find it hitched to everything else in the universe.”  
— John Muir (1)

**T**ranshumanism stands for progress, for human enhancement, for reason, science and technology to reveal human potential, a bringing forth “of the true into the beautiful”(2)(3). There are many forms of Transhumanist thought. Democratic, accentuating egalitarian access to enhancement. Libertarian, calling for free market economy to ensure research and innovation has fertile ground. Extropian, affirming indefinite evolutionary potential, which includes futures with indefinite human lifespans. Integral, advocating for cognitive enhancement and existential maturity within a developmental framework that breaks out of scientific reductionism (4). Post-anthropocentrism is moving into post-dualism. Humanism is out. Deep relationality is in. The subjective self is getting a complete make-over. We see this in daily culture with gen Z affinity to interconnection, cooperation and globalism. In

biology we are seeing a movement into systems perspectives. No area has this been more apparent than in integrative immunology.

## Immune Selfhood

From its inception, immunology has been concerned with biological identity. There is an immune self and it defends the body against foreign invaders. Each human has definite immune borders and the function of the immune system is to respond to the violation of these. Anatomically, the immune borders are comprised of epidermis, dermis, mucosa and so on. Functionally, the immune response against foreign agents is launched via lymphocytes, neutrophils, monocytes/macrophages and their signaling agents — antibodies cytokines, complement

proteins and so on. All components of the immune self are considered genetically proprietary. We've got the 'self' clearly pitted against 'non-self'. From the perspective of infection, the individual is self-contained, and in times of pandemics, the best approach is defense, offense and insulation. This is the classic biomedical immune theory — there is a biological self, its borders are clearly defined, and it deserves protection, defense.

Under this umbrella, allopathic therapeutic models make benevolent sense. Antiviral, antibiotic, antifungal, antiparasitic pharmaceuticals & biotech are perfect agents of an intelligent protective, defensive and offensive strategy. In malignancy, chemotherapy and radiation follow along the same path. We've got radiation, chemo and surgery eradicating dangerous tumors, saving lives. Although cancer immunotherapy (T-cell transfer therapy, Monoclonal antibodies, Cancer vaccines) would fall more to the left of the classic warfare model, serving more as immune system modulators, the wording around biomedical immunotherapy still employs self/non-self language, calling on the immune self to 'fight cancer'.

Getting you well can be a 'battle' even in integrative, functional and naturopathic approaches. Botanicals have antiviral, antibacterial, antiparasitic properties. Nutraceuticals have immune 'boosting', immune arming capabilities. As long as therapeutics are 'getting rid of' pathogens, or supporting you in 'fighting' cancer, or helping you 'beat' autoimmunity, regardless of the approach, they are employing the classic epistemological definition of the static self. They are still bathing in dualism.

Since we are moving into post-dual futures,

how can we move beyond the protective motif of the immune system. It's deeply ingrained in all medical thinking, our politics, the daily language we use, the way we experience even a simple cut - the painful redness, the feared invasion, the potential of dangerous infection, the immediacy of resolution. It's so visceral to each and every one of us, the pull to protection, to survival at all cost, the urgency of re-establishing biological safety. Can we change the way we see our biological self. Can the boundaries of immune selfhood be dissolved. Immune identity, individuality, agency - can they go fluid.

### Immune Continuum

If there is the self and then there is the environment, there must be some kind of tolerance taking place. Not all foreign agents are malevolent, destructive, dangerous. Even if we consider what is within the confinement of our skin and mucosa, the human body houses trillions of microorganisms, outnumbering human cells by 10+ to 1. Immune tolerance is the physiological norm from this perspective. And if we are in fact made up of more microbial DNA than human DNA, where does selfhood stand, not purely in the genetics. Immunity is more of a mediation, a dynamic exchange of information. A cooperative symbiotic model of the immune self is perhaps much more fitting to biological reality. We are moving beyond defending an insular individual here. The body is more of an "interactive economy". We are more of a "complex consortium, a holobiont, a multicellular eukayote plus it's colonies of persistent symbionts" (5).

This takes immunity from the focus on aggressive immune protection of an immune self to elucidation of an interactive balance.

The biological self could in fact be 'a homeostasis', an ongoing process of establishing physiological harmony. Virulence and malignancy do exist. The direct role of the holobiont immune action is not to kill-off but to uphold autoregulation. It's a collective response to retain homeostasis, structural and functional integrity. It's not selfhood in the classic sense. It's a systemic balancing act.

So what is immunity. What are the defining characteristics of individuality, of immune selfhood. Looks like the answer to these questions lies along a continuum between a pure scientific/genetic reductionism and complex ecological models. The immune self could be everything encoded by the genome and it could be the immune network itself and everything in between (6). Early immunology made us into an insular organism that must be defended. Later, immune theory expanded into surveillance/tolerance, where immunity is a developmental process that houses no static immune self but is forming itself as it interacts with the environment. A more post-dual model of immune theory does away with the concept of the immune self altogether. Immunity has no agency. It's a perception. It's a cognition. It's the absent self.

### Immune Cognition

If we dispense with the notion of the 'immune self' altogether, how do we proceed in understanding virulence or malignancy. Niel Jerne (7), the formulator of the absent self theory, saw the immune system as self-referential, as a network that sees only its immediate constituents and perceives only what it might 'know' as itself - so beneficial microbiota would be included in the concept of a fluid recognized self.

Immune activation is not based on self/non-self distinction but by the specific context of antigen presentation, the terrain of the moment. This is immune cognition at play. Antigenic recognition is a perceptive event that is evolving and changing. In classic immune theory, the antigen is a code that carries meaning - foreign entity, must eradicate. Jerne's network theory, on the other hand, assigns no code to the antigen, the binding of antibody to antigen is simply an informational exchange that could lead to tolerance or offense depending on network terrain status.

This is much like we see in the expansion of cognitive boundaries in psychology, culture, politics. What was once foreign may finally be familiar. What was once benign could become, under specific circumstances, destructive. How we perceive life is what matters. On a microscopic level, how the immune symphony cognizes its playing parts in the moment is what matters. It's not personal, much like life itself. The borders are dissolving. There is no one home.

### Immune Intentionality

Looks like the immune self is close to escaping definition. Immune theory can still of course practically employ stimulus-response immune activation, but it no longer needs to be with the intention of defending selfhood. The immune system is a perceptual event that 1) has constant stimulatory input from internal and external environment 2) has a history and memory 3) employs evolutionary identifications of what is generally safe and what is potentially dangerous 4) is on a continuum of acceptance and denial based on a particular homeostatic set point at each particular moment in time. The priority is mutualist relationships, the main-

tenance and the expansion of bio-ecological symbiosis.

Now that the immune system is properly understood as a 'network system' without the need for static agency, immune therapeutics and enhancement can be open to employing multifactorial approaches. The intentionality of the immune system vibrates on a continuum from survival to harmony. Biomedical therapeutic approaches do well in employing the full spectrum of this continuum, from defense when needed, to establishing tolerance and symbiosis on a continual basis. For instance in times of virulence, like in a pandemic, it is not only important to defend, kill-off, isolate. It's equally important to strengthen bioresilience and autoregulation, to upgrade the immune system each time up a notch. In fact, you could argue the 'upgrade' is a priority, so that biological futures of the organism and of the community are immunologically more flexible. Biotechnologies in the making are already playing a key role in speeding up the immune upgrade. The field of immune rejuvenation is in its prime inception years. Pluripotent stem cell and exosome therapeutics, low-dose immunotherapy, thymus regeneration, gene therapy are a few areas that I personally zone in on at this time. So much more ahead in this field, looking forward to seeing how it all unravels.

Let's remember the end-point intentionality of our biological life. Biological holobionts - our bodies - are here to thrive, to propagate, to evolve, and ultimately to transcend biology itself.

Humanity looks to me like a magnificent beginning but not the final word.

— Freeman Dyson (8)

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