

Legend to the pdf figure called "summary students 2021 LDP"

There are multiple ways of creating an immune system. When looking at an amoeba and a man what we observe in between is pretty disparate. Indeed, no single linear history of THE immune system can be written. Yet one can isolate branches in the general tree of evolution where history of one branch makes sense as a distinct entity with a given set of shared properties.

For instance, due to the introduction of a certain form of somatic generation of lymphocyte diversity, chordates, with their vertebrate progenies form a distinct logic branch where the consequences of this event will develop in a certain homogenous way. See the pdf "summary students" (1) narrow branch obtained upon deciding to consider TB Lineages, AID, RAG and MHC as the criterions to belong to the branch

But if one accepts a less narrow context one can see bigger branches (3 e.g.) of which that of chordates emerged, it is the branch of triploblastic Metazoa that use mesoderm derived cells to build up one's immune system, making use of homologous transcription factors to generate the effector cells populations.

If one is less demanding about criteria one can obtain a much bigger branch, a tree in fact provided one gets satisfied with the conservation of elements rather than of whole pathways and mechanisms

It becomes more a history of elements conservation across kingdoms. Phagocytosis (6) is one of these and surprisingly, the MHC backbone architecture (7) might be another one with its primordial genes involved in some sort of intracellular autonomous immunity or integrity control.

For the rest if one wants to detect similarities one will have to be satisfied with these above molecular categories conservations or/and enter the world of analogies for mechanisms. It is no longer a homologous mechanism that is conserved but the "idea" of its function. For instance, the idea of memory, specificity, adaptivity can be found realized in different manners even in prokaryotes' immune systems, or across Metazoa but in a way that has mechanically nothing to do with what we see in man. It simply illustrates that during evolution the answers to the selective pressures had to conform to a certain scheme that shows similarity from plants to man.