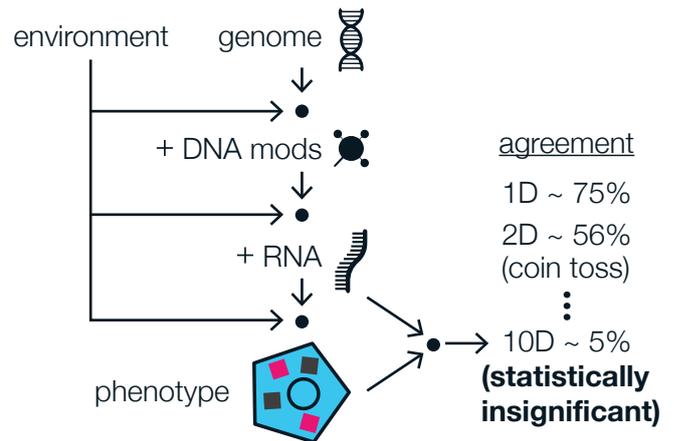
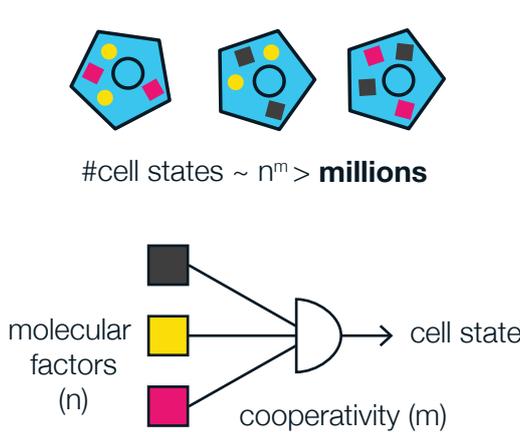


# Single Cell Decade

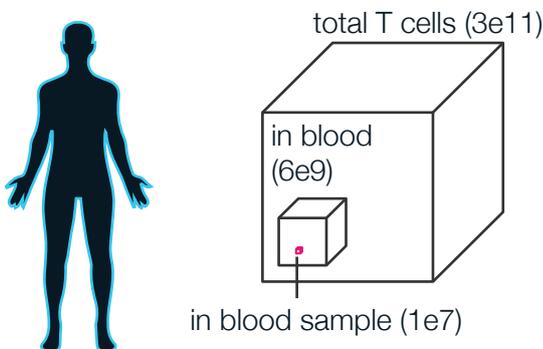
A cell is commonly referred to as the basic building block of life, a statement that says little regarding the importance of cells to overall health. The ambiguity of this statement is in no small part due to the obscure nature of the word life. While the definition of life continues to be debated, what is clear is that living things are excellent at finding ways to survive. Their behavior is not completely determined by their immediate surroundings. Rather, living objects have a set purpose that they pursue using a network of molecular interactions. This provides cells the unique ability to propagate their intentions and ultimately effect the body as a whole. Consequently cells are the basic drivers of health and disease.

Single cell healthcare strives to understand embodied tendencies, including their potential to propagate and the degree to which they are in alignment with the lifestyle goals of the individual.



## How many human cells are there?

The body is made up of over 10 trillion cells. Each is unique but similarities in function exist. Cells differentiate in an irreversible manner into distinct cell types and a cell of a given type can transition between one of many possible states. Over 200 cell types with a multitude of cell states are currently known and more are discovered daily. The ultimate goal we face today is to map the millions of states to their effects on overall health.

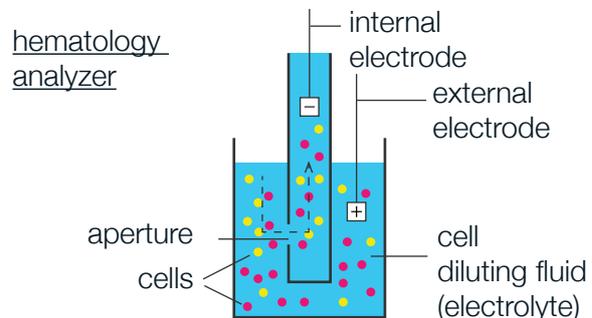


## Does a single cell matter?

Intuitively, the human body develops from a single cell and so yes, a single cell is important. Within the context of a developed body, autoimmune cells (4 naive cells per body) support the intuition. Diagnostically, a single cell in a drop of blood represents a cohort of over a million cells with similar states.

## Can a cell be reduced to a molecule?

A cell state is a product of its DNA and its history. DNA/RNA, both being nucleic acids, provide a convenient molecular representation of a cell. But even RNA fails to capture the cell state. Guessing protein presence from RNA data is akin to making a single correct guess in two coin tosses. The uncertainty is greatly compounded when guessing cell states, which are determined by protein combinations rather than isolated protein species.



## Single cell technologies in healthcare

In the US, over 500M blood draws are made each year amounting to approx. 50peta sampled cells. Some are quantified by hematology analyzers in a Complete Blood Count. In these tests, the richness of cells is reduced to a count of 3 abundant (at least 100M copies in a normal body) cell types.