

“The Epi-State”

Genetics is the four-color paint of your ancestral DNA,
but epigenetics is the dynamic, cellular blending palette
of kinetic variations of each T,G,C, and A,
wound around hugging, tugging histones, switch and re-set
all cells' hues and functional fates, from life's first cell, on the very first day.

As new embryo, the canvas is mostly empty,
except for the molecular palimpsest of your family tree,
where your parents and grandparents have marked their echo in time
as DNA's methylated whisper, unless changed by CRISPR-Cas9.

Yet this small, guiding voice of methyl and hydroxy-methylation
is more than just recommendation for lineage specification,
it is the priming, defining, and confining state of delineation;
starting from the Grand Central of endo, meso-, and ectoderms, it is the last station.

But, if these epigenetic marks are not at the right location, time, and place
during development, then the folding of a neural plate or the structure of your face
could go awry, where a notochord becomes a noto-knot. In such a case,
an embryo can start far behind, or worse yet, never get to run in the race.

To give all children a good start when they set their cells in motion,
we now use folic acid supplementation in all breads, cereals, and flour.
Yet, we know now that this is not a universal, all-saving, magic potion,
for mice with certain genetic backgrounds find such flavors dour.

We now peer into the genomes and epigenomes of spina bifida and NTD patients,
working to stratify and characterize the colors of risk in the epigenome
with a hope for a future of personalized medicine built on sound regulatory cadence.
Personalized medicine starts with the very first cell. Thus, a cozy home
for the epigenome, epitranscriptome, and regulome is one with a specific, safe radiance.

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