Caution: The following was prepared to explain how and why crystallography can be thwarting the ability of biomedical research to take a quantum leap forward in the ability to verify the cause of chronic diseases.
Corporations seeking to increase shareholder value or research centers seeking to increase funding or grants must revisit their bioinformatic search processes to ensure they utilize the model for epigenetics based on physical science. Failure to adopt the new model can produce negative outcomes.

Crystallography Overview and Shortcomings

A Nobel Prize for crystallography in 1915 created global interest in the concept. By the mid-1920's x-ray crystallography was being use to study enzymes and cytokines.

The technique allowed for visualization of amino acids and research designated these cellular structures/configurations to be proteins comprised exclusively of amino acids.

Unfortunately, the use of x-ray crystallography resulted in the following shortcomings:

- Without a frame of reference, minerals and elements that were part of enzymes and cytokines could not be identified.
- Lacking the ability to isolate mineral and element constituents, the known principles of antagonistic and agonistic relationships between elements were not applied to cellular research. Accordingly, using calcium and magnesium as an example, chronic imbalances between the ratio of these elements were not used as factors that could contribute to chronic diseases resulting from chronic poor cellular health.
- The fundamentals of transactional elements in physical chemistry were not applied to cellular biology. In essence, failing to apply the bioelectric properties of elements in cells (i.e. positive - negative) prevented the application of fundamentals such as alternating current pioneered by Nikola Tesla.
- Current genomic sequencing identifies RNAi as causal path factors for chronic diseases. Careful review can identify the mechanism as one required by cells to maintain equilibrium (homeostasis). Lacking an explicit and replicable model for cellular signaling has resulted in the erroneous assumption that correlation in relation to chronic diseases is causation. As a result, rather than focusing on the causes of imbalances that create over activity of the RNA (e.g. copy error mutations), the pharmaceutical industry is "inhibiting" these cellular activities.
  Our epigenetic modeling based on the fundamentals of physical chemistry provides a verifiable explanation for why drug reactions have increased 500% in the twelve year period 2004 - 2016; i.e. the natural cellular defense to enable homeostasis is being inhibited. http://www.jsonline.com/story/news/investigations/2017/03/17/analysis-reports-drug-side-effects-see-major-increase/99211376/

- Failing to apply the fundamentals of physical chemistry has resulted in the inability to understand how and why copy errors driven by anabolic (binding) and catabolic (disassembly) mechanisms are responsible for 2/3 of all chronic diseases. Regulated by self-assembly and ionic polarity that occur as cells divide and realign can be understood and modified (prevention/treatment/cures) when research identifies minerals and elements as the foundation for cytokines and adapts research accordingly.

Moving Forward

In 1998, the use of atomic force microscopy allowed for visualization of DNA activity. The observation created global interest because the findings were thought to be nanobacteria. Subsequent work identified the process to be interactions involving two elements - calcium and phosphorus; hydroxyapatite.
https://www.scientificamerican.com/article/the-rise-and-fall-of-nanobacteria/

In January 2010 an article reported the pursuit by the EPA to address the nanoscale activities that result from interactions of elements such as calcium and phosphorus in conjunction with RNA.
https://www.scientificamerican.com/article/big-need-for-a-little-testing/

To date, the process of assaying interactions between minerals and elements (e.g. calcium - magnesium, sodium - potassium, etc.) in conjunction with amino acids to turn cellular mechanisms and activities "on-off" activities has not been fully elucidated.

The pitfalls of relying on crystallography have prevented cellular research to consider minerals and elements as the foundation for cytokines. Using Interleukins 13 - 16 and 18 as examples, the interactions between iron - manganese, iron - sulfur and copper - zinc are "hidden in plain sight" (available as findings of research in conjunction with superoxides).

Retrospective review of a large number of studies by the MCFIP team was requited to identify the mineral and element constituents of cytokines as well as gasotransmitters.
http://www.mcfip.net/upload/Cell%20Surface%20Signaling%20Molecule%20Formation%207-2017.pdf

Summary

Using the fundamentals of physical science, MCFIP has dedicated tens of thousands of hours to the tedious task of developing and applying an explicit model for DNA repair and the causes of copy error mutations.

The website includes a many examples for the causes of chronic diseases in the Discoveries and Examples tab, processes that, to our knowledge, have not been replicated by any other global entity.

MCFIP's mission is to share its applications for epigenetic modeling with research entities that have the resources and motivation to capitalize of resolving 2/3 of all chronic diseases and to enhance the preliminary model developed by MCFIP for the remaining 1/3.