In his first State of the Union address, President George Washington encouraged funding for science.

Our nation’s first president told the first Congress in 1790, just prior to the creation of the first federal budget “…that there is nothing which can better deserve your patronage than the promotion of science and literature. Knowledge is in every country the surest basis of public happiness. In one in which the measures of government receive their impressions so immediately from the sense of the community as in ours it is proportionally essential.”

Such esteem and priority bestowed on knowledge, scientific knowledge especially, has always been a guiding principle in the United States and embraced by our founders. That conviction was given form in 1863 when the National Academy of Sciences was created during the presidency of Abraham Lincoln. President Lincoln was a patron of science and the first, and only, American president to have been granted a scientific patent for an invention. Many institutions, foundations and trusts spanning the fields of science and engineering later ensued and flourished, including those supported by philanthropy and patronized by individuals blessed with vision and abundance.

Perhaps, the spirit of scientific innovation was most clearly immortalized through the words and actions of President John F. Kennedy in 1962 while describing his ambitious plans to use science for space exploration, “We choose to go to the Moon in this decade and do the other things, not because they are easy, but because they are hard; because that goal will serve to organize and measure the best of our energies and skills, because that challenge is one that we are willing to accept, one we are unwilling to postpone, and one we intend to win...”.

Dr. Zaher Nahle, featured for his passion for science
7 Research Lessons from the Lab Bench of Dr. Nahle (cont’d)

That indomitable spirit that hinged on science in the pursuit of challenging endeavors put the first human on the face of the moon, saved millions of lives from deadly diseases, and prevented incalculable disasters around the world. Science has forever changed the way we live on this planet and altered the patterns in which we interact with one another. Every single day, the science of medicine in particular brings health and wellness to millions of its beneficiaries. Biomedical research brings hope to millions of others still awaiting a breakthrough to help them overcome an illness or improve the life of a loved one.

I underscore throughout our communications the value of science and highlight the severe knowledge gaps existing in our disease space. Many of our problems in ME/CFS (some shown to the right) would be reduced, even eliminated, with a better understanding of the scientific basis of ME/CFS.

In the last issue of The Solve ME/CFS Chronicle (Winter 2017), we highlighted some of our scientific work in the pipeline using a “dashboard” of current studies. We believe that these will fill gaps in knowledge and spark additional work by us and others (see graphic on facing page).

Nonetheless, we are assisting, even shaping, national initiatives in the disease space through fair and unbiased participation in projects that will create value in pre-clinical, clinical and translational ME/CFS research. As we expand our work and grow further our scientific portfolio, I wish to share a few thoughts about my own experience at the scientific laboratory bench and some lessons I picked up along the way:

1. **Not every finding is a breakthrough:** It is human to be excited about a scientific result but objectivity is at the core of scientific endeavors. Preliminary results, even publishable ones, should not be exaggerated (nor minimized either). Using the right tone when sharing data, especially in public, is more beneficial in the long run. It is what differentiates an article in a scientific journal from a sensational column in a gossip magazine at the checkout isle. Scientific findings must be qualified up-front with all study assumptions, limitations and caveats.

2. **Perseverance is essential:** Not every apple that falls from a tree can trigger a light bulb and inspire a new theory. And while some can be as perceptive a Newton himself, most of us regular folks encounter achievements as a result of sustained and laborious work day in and day out, a process that is often mired in many failures and setbacks. The discipline of seeing things to completion in experimental sciences – and not giving up – when things get rough is an invaluable characteristic.

3. **Flexibility can save your life:** It is counterproductive to be ardently dogmatic in experimental sciences, or in any of the sciences for that matter. The very best researchers I know keep an open mind and are often persuadable. They revise, evolve, and update their hypotheses constantly and are fearlessly adaptable. They are curious to learn from others and will accept criticism from reviewers or even from detractors. Inflexibility is the Achilles’ heel of the discovery process.

4. **Context is the crucial factor:** What works in animal models or cell culture systems may not work in humans and vice versa. Scientific context is supremely important. As such, extrapolating...
findings from one context to the other without proof can be misleading, even reckless. Space and time are always crucial elements too. I always ask myself the three basic W’s “what”, “when”, or “where” anytime I find myself reading an article or examining a study.

5. **Intellectual diversity is critical:** The cross-pollination of ideas and the diversity of thoughts and opinions can be the best thing that happens to a scientific enterprise. Collaboration with interdisciplinary teams will add considerable insights and enable scientists to explore new avenues.

6. **The system is not perfect:** The scientific system in its current state is far from perfect. It is credit-based and not merit-based. This is a nuanced and complicated topic that requires a deeper analysis. Suffice it to say that understanding the shortcomings of the system is important. A quick example that comes to mind is our attitude towards negative results. Little exposure is given to those findings although they can help us avoid unnecessary repetitions, saving us time and money.

7. **There is no substitute for quality:** This is self-evident. Cutting corners is not only improper but can be unethical. Reproducibility of the data—under the exact same experimental or clinical conditions—is a requisite marker of quality.

All of these principles certainly apply to the field of ME/CFS research. Because our scientific research resources are so scarce at SMCI, as they are everywhere in the ME/CFS research field, none of us has time or money to waste by deviating from these truths about the research process.

SMCI’s research program, using the expertise of our Research Advisory Council, supporting the work and collaborating with ten research teams in four countries, demonstrates our commitment to genuine, collaborative scientific progress. For the many ME/CFS patients who struggle with this awful disease, the stakes are very high. We use the principles above to move forward with rigor, passion and speed—given the limited resources at our disposal.