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Introduction to special Carl Woese issue in *RNA Biology*

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Many of us have been influenced by Carl Woese's many contributions to science and the manner he articulated these perspectives. Others are fortunate to have known Carl. I wrote one of the many obituaries for Carl.[1-9] I received numerous comments for this document. Michael Levitt said, "I had not heard that Carl had died and my sudden sorrow was tempered by your wonderful written and moving obituary." Freeman Dyson said, "thank you for sending the Woese obituary which told me a lot that I did not know about him. It was very inconsiderate of him to die before I had a chance to meet him." Jorgine Ellerbrock, Sr. VP at GenProbe/Hologic said, "I simultaneously felt like I knew him and saddened that I did not." And Harry Noller said, "You left out his 'discovery of humor.'" Given Carl's stature and discussion about his demeanor, I had been asked over the years what Carl was like. I felt obliged to tell some story, analogous to Dorothy (and Toto!) meandering along the yellow brick road to meet the Wizard of Oz. This story is not for me to tell. Paul Gardner, Renée Schroeder, and Eva Riedmann at the journal *RNA Biology* gave me this opportunity to let others tell many stories.

This venue could temper our sadness with more appreciation for Carl's many contributions in a diversity of fields and embellish this tribute with a few light and humorous anecdotes. I envisioned a series of articles that address part, if not all, of the broad spectrum of biological topics and disciplines that Carl Woese pondered, analyzed, deliberated on, and redefined during his long and productive career. I also want this special issue to reflect Carl's unique personality that captured and motivated many of us. Not only was he a mentor to his undergraduate and graduate students and PostDocs, he was a mentor to many of us at all stages in our careers. To fulfill these objectives, I sought articles from people who knew and others who didn't know Carl, from those who are intimately knowledgeable about his research and others who observe the many who benefit from it, and from those with expertise in RNA to those who articulate fundamental principles, processes, and results of evolution.

The process of requesting articles from colleagues, some of whom I had not corresponded with in many years, in addition to many others who I had never corresponded with, was a daunting and enjoyable responsibility. Two of the many follow.

Peter Moore said, "I am flattered that you would think of asking me to contribute to the venture you are embarking on. I could write something about Carl, but the piece I would produce, if I did, would scarcely differ at all from what any of his other (many) distant admirers might write. As you know, Carl seldom appeared at ribosome meetings, or, indeed, at meetings of any other kind, and so I only ever heard him talk once or twice."

My recent correspondences with Larry Gold reminded me of his wit and his long and special association with Carl. "I think I would focus some on how he was always wondering about things (all things, actually), and how they don't make people like Carl anymore … I would be honored to be included, so let me know." My response, "I am thrilled that you have agreed to write an article for this special Carl Woese issue in *RNA Biology*. And more thrilled, based on your email, that your article will be vintage Larry Gold. Probably only you and a phone call from Stockholm in mid-October could wake Carl up from his peaceful sleep. Carl would love to tell Larry Gold stories. And I never stopped him when he was telling me the same story again." Larry's response, "I never tired of hearing the same stories, because the please was in his smile, not the story. He smiled each time he told the story as though he was hearing it for the first time … I do miss that guy."

However, not everyone respected Carl. One professor spoke about Carl's "outrageous diatribes about evolutionary biology" in the last few publications in his career. Many would disagree. These outbursts started in the 1960s and 1970s. I read my first few Woese papers shortly after starting graduate school at the University of California at Santa Cruz in the fall of 1977. During my last semester as an undergraduate at the University of California at San Diego we discussed and debated what came first, proteins or DNA in Dr Russell Doolittle's "Biochemical Evolution" class. That fall I learned that Carl (and my PhD adviser, Dr Harry Noller!) had the audacity to proclaim, "NEITHER, RNA came first." Then later that fall I heard more diatribes. And this was published on the front cover of the reputable science journal, the New York Times, most likely to circumvent peer review. Cellular life was once divided into two primary groups, the Procaryotes and the Eukaryotes, a well accepted, standard doctrine in textbooks. Carl (and George Fox) split the Procaryotes into two phylogenetic groups, the Archaebacteria and Eubacteria (later renamed Archaea and Bacteria). I was confused. I didn't know what to believe, the lectures and textbooks that was the foundation of my knowledge of biology, or these contemptuous proclamations. This bewilderment was only exasperated when Harry proclaimed that Firesign Theatre's "*Everything You Know is Wrong*" was true. Well, the tale of Woese's diatribes did not start at the end of his career, nor did they stop in the late 1970s—*Everything We Knew Was Wrong*.

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References

1. Gutell RR. You tell Carl that some of my best friends are Eukaryotes: Carl R. Woese (1928-2012). RNA 2013; 19:vii-xi
2. Noller H. Carl Woese (1928-2012). Nature 2013; 493:610; PMID:23364736; http://dx.doi.org/10.1038/493610a
3. Goldenfeld N, Pace NR. Retrospective. Carl R. Woese (1928-2012). Science 2013; 339:661-661; PMID:23393257; http://dx.doi.org/10.1126/science.1235219
4. Doolittle WF. Carl R. Woese (1928–2012). Curr Biol 2013; 23:R183-5; PMID:23596635; http://dx.doi.org/10.1016/j.cub.2013.01.057
5. Powers ET, Balch WE. Diversity in the origins of proteostasis networks–a driver for protein function in evolution. Nat Rev Mol Cell Biol 2013; 14:237-48; http://dx.doi.org/10.1038/nrm3542
6. Pederson T. Life, redrawn: a memoir of Carl R. Woese (1928-2012). FASEB J 2013; 27:1285-7; PMID:23547106; http://dx.doi.org/10.1096/fj.13-0401ufm
7. Gold L. The kingdoms of Carl Woese. Proc Natl Acad Sci USA 2013; 110:3206-7; http://dx.doi.org/10.1073/pnas.1301438110
8. Albers S-V, Forterre P, Prangishvili D, Schleper C. The legacy of Carl Woese and Wolfram Zillig: from phylogeny to landmark discoveries. Nat Rev Microbiol 2013; 11:713-9; PMID:24037452; http://dx.doi.org/10.1038/nrmicro3124
9. Sapp J, Fox GE. The singular quest for a universal tree of life. Microbiol Mol Biol Rev 2013; 77:541-50; PMID:24296570; http://dx.doi.org/10.1128/MMBR.00038-13