



## Profile: William Clayton Thompson (Clay)

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Pfizer, Inc., Cambridge, Massachusetts



BS, Mathematics (Physics minor), University of North Carolina Chapel Hill; PhD, Applied Mathematics, North Carolina State University

### EARLY INFLUENCES

**What sparked your interest in mathematics? When did you know that you would use math as a path to your career?**

*My interest in mathematics and the physical sciences began in middle school—I have long been interested in experiments that provide insight into natural phenomena, and in using mathematics to analyze data from those experiments.*

*I first became interested in a mathematics career after being encouraged to pursue graduate study in mathematics by one of my undergraduate professors.*

**Was there a pivotal moment/experience/ influential person that led you in this direction?**

*Perhaps the most pivotal moment in defining my future career was during a year-long course sequence, Mathematical Methods for Engineering. During the second semester, we conducted several experiments in class, derived differential equations to describe those experiments, and then used those equations to analyze the data. For the first time, I was able to see exactly how mathematics could supplement experimentation in the physical and biological sciences.*

### CAREER/CAREER PATH

**Describe your current position and briefly, the path you took to get there.**

*My current job exists at the intersection of biology, mathematics, and computer science. I work in the Cardiovascular, Metabolic, and Endocrine Diseases (CVMED) research unit at Pfizer to develop and analyze mathematical models of disease. My work increases the efficiency of clinical drug development by analyzing experimental data and making novel predictions regarding proposed treatment mechanisms. My work spans the drug development pipeline, from novel idea through pre-clinical and clinical development.*

**What is a typical day at work for you? Please list your job responsibilities. What are you responsible for?**

*A typical day can bring any number of challenges. Over the course of a project, I will spend many days reading biology books and research papers, developing mathematical models, writing computer code, and working with biologists to plan new experiments. My favorite part of the job is its interdisciplinary nature. I frequently work not only with biologists, but also with chemists, statisticians, and clinicians to maximize the accuracy and impact of the work. It is my responsibility to ensure that critical questions regarding a particular drug target are answered and that results are communicated in a clear and timely manner.*

**How many hours per day or week do you typically work? Do you have flexibility that allows a good life/work balance?**

*Given the nature of drug development, time lines can occasionally be a significant issue—major projects can arise suddenly and die quickly. Like many major research organizations, a significant time input is required, but Pfizer has a policy of encouraging flexible work hours to promote work-life balance.*

### CAREER EXPECTATIONS FOR YOUR FIELD/POSITION

**How/why are applied mathematics and/or computational science important to your industry? How is it/are they used?**

*Mathematical modeling is important to the pharmaceutical industry as it permits rapid and cheap testing of novel hypotheses. A validated mathematical model is the ultimate test of how well a biological system is understood. Also, mathematical modeling provides a framework through which a vast array of prior knowledge can be explicitly assembled and tested, either for consistency or novel implications.*

**Where do you see the future of math in industry or in your particular career?**

*In my research unit, mathematical modeling and analysis is a fundamental component of the drug discovery process as it serves to identify key hypotheses and gaps in our understanding of various mechanisms. As more and more data is made available through novel experimental techniques (think “Omics” data), I believe mathematical modeling will grow in importance as a result of the natural role it plays in assembling quantitative knowledge.*

### ADVICE

**If you could advise someone currently pursuing the same degree or profession, what would you say?**

*The most important advice I would give is for students (including undergraduates) to find an academic advisor whom they trust. Professors are a valuable source of knowledge and career advice. I also advise students to establish a broad knowledge base by*

*exposing themselves to diverse fields. This is particularly important for interdisciplinary research—the hurdles to working across academic disciplines can often be underestimated.*

*Any specific supplementary skills or training you can name that a person pursuing this profession should acquire?*

*Good programming skills are a great thing to have, but good communication and presentation skills are absolutely vital.*

## **SALARY**

*For 2015, can you speculate about the salary range of starting, mid-level and /or senior positions in your specific field?*

*Starting: 80k-100k (PhD for the Boston/Cambridge area)*